EAO | Environmental Assessment Office

Assessment Report
for Tilbury Marine Jetty Project

With respect to the Application by Tilbury Jetty Limited Partnership for an Environmental Assessment Certificate pursuant to the *Environmental Assessment Act*, S.B.C. 2002, c. 43

October 7, 2022

BRITISH COLUMBIA

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COMMON TERMS AND ACRONYM LIST

µg/m^3	micrograms per cubic metre
µPa	micropascal
12 nm limit	12 nautical mile (nm) limit of Canada's territorial sea
The Act	*Environmental Assessment Act,* 2002
the Agency	Impact Assessment Agency of Canada, known until August 28, 2019 as the Canadian Environmental Assessment Agency
ACR	Aboriginal Consultation Report (i.e., ACR-1, ACR-2, ACR-3, and ACR-4)
AIA	archaeological impact assessment
AIR	Application Information Requirements
Application	Application for an Environmental Assessment Certificate
ATB	Articulated tug barge
B.C.	British Columbia
BC OGC	BC Oil and Gas Commission
BC WQG	BC Ministry of Environmental and Climate Strategy Water Quality Guidelines
BMP	Best Management Practices
BVS	Bunker Vessel Scenario
BVSA	Bunker Vessel Scenario Assessment
CAAQS	Canadian Ambient Air Quality Standards
CCG	Canadian Coast Guard
CCME	Canadian Council of Ministers of the Environment
CDC	Conservation Data Centre
CEAA 2012	*Canadian Environmental Assessment Act, 2012*

CEMP	Construction Environmental Management Plan
CEQG	Canadian Environmental Quality Guidelines
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalents
COPC	Contaminant of Potential Concern
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CPD	Certified Project Description
CSA	Canadian Standards Association
Current Use	Current Use of Lands and Resources for Traditional Purposes
DAS	Disposal at Sea
dB	Decibel
dBA	A-weighted decibel
Delta	City of Delta
DFO	Fisheries and Oceans Canada
DPM	Diesel Particulate Matter
DWT	Deadweight Tonnage
EA	Environmental Assessment
EAC	Environmental Assessment Certificate
EAO	Environmental Assessment Office
ECCC	Environment and Climate Change Canada
ECHO	Enhancing Cetacean Habitat and Observation Program
EMP	Environmental management plan

ENV	Ministry of Environment and Climate Change Strategy
EPA	US Environmental Protection Agency
EPIC	EAO's Project Information Centre
FLNRORD	Ministry of Forests, Lands, Natural Resource Operations Rural Development
FNFLF	First Nations Fisheries Legacy Fund
FOR	Ministry of Forests
FortisBC	FortisBC Energy Inc.
FRWQO	Fraser River Ambient Water Quality Objectives
FSC	food, social and ceremonial
FTBB	Floating Temporary Bunker Berth/ Platform
FTEs	full-time equivalents
GDP	Gross Domestic Product
GHG	greenhouse gases
ha	hectare
%HA	percent highly annoyed
HC	Health Canada
HCA	*Heritage Conservation Act*
HHRA	Human Health Risk Assessment
HNS	Hazardous and Noxious Substances
HQ	Hazard Quotient
Hz	hertz
ILCR	Incremental Lifetime Cancer Risk
IMO	International Marine Organization

IPCC	Intergovernmental Panel on Climate Change
ISO	International Organization for Standards
km	kilometre
KMM	Key Mitigation Measure
kt	kilotonnes
KUS	Knowledge and Use Study
LAA	Local Assessment Area
LCFS	BC Low Carbon Fuel Standard
LNG	liquefied natural gas
LSA	Local Study Area
LWRS	Ministry of Land, Water and Resource Stewardship
m	metre
m^2	square metre
m^3	cubic metre
m^3/s	cubic metre per second
m/s	metres per second
MAA	Marine Assessment Area
MARPOL	International Convention for the Prevention of Pollution from Ships
mg/L	milligram per litre
MLAA	Marine Shipping Assessment Local Assessment Area
MOU	Memorandum of Understanding on Substitution of Environmental Assessments (2013)
MRAA	Marine Shipping Assessment Regional Assessment Area
MSA	Marine Shipping Assessment

MSAA	Marine Shipping Assessment Area
MT	million tonnes
MTPA	million tonnes per annum
nm	nautical mile
NOAA	National Oceanic and Atmospheric Administration
NO_2	nitrogen dioxide
NO_x	Nitrogen Oxides
OEMP	Operational Environmental Management Plan
PAH	polycyclic aromatic hydrocarbons
PBRP	Pattullo Bridge Replacement Project
PC	Pathway Components
PCB	polychlorinated biphenyls
PFMA	Pacific Fishery Management Area
PM	Particulate Matter
$PM_{2.5}$	particulate matter 2.5 micrometres or smaller in diameter
PM_{10}	particulate matter 10 micrometres or smaller in diameter
PMTJ	Permanent Marine Tandem Jetty
QP	Qualified Professional
RAA	Regional Assessment Area
RBT2	Roberts Bank Terminal 2 Project
Richmond	City of Richmond
RNG	Renewable natural gas
RSA	Regional Study Area

SARA	*Species at Risk Act*
SPL_{rms}	root mean squared sound pressure levels
SRKW	southern resident killer whale
SRP	strategic review process
TC	Transport Canada
TEK	Traditional Ecological Knowledge
TERMPOL	Technical Review Process of Marine Terminal Systems and Transshipment Sites
TJLP	Tilbury Jetty Limited Partnership
TLU	Traditional Land Use
TLUS	Traditional Land Use Studies
TMJ	Tilbury Marine Jetty Project
TMX	Trans Mountain Expansion Project
TOC	Table of Conditions
TransLink	South Coast British Columbia Transportation Authority
TRC	Truth and Reconciliation Commission
TSS	Total Suspended Solids
TUS	Traditional Use Studies
UN Declaration	United Nations Declaration on the Rights of Indigenous Peoples
VAFFC	Vancouver Airport Fuel Facilities Corporations Fuel Delivery Project
VC	Valued Component
VFPA	Vancouver Fraser Port Authority
VOC	volatile organic compounds

EXECUTIVE SUMMARY

Overview

Tilbury Jetty Limited Partnership (TJLP), as represented by its general partner Tilbury Jetty GP Inc., is proposing to construct and operate the Tilbury Marine Jetty (TMJ), located on Tilbury Island (adjacent to and in the Fraser River) in the City of Delta, British Columbia (B.C.). TMJ would be a new marine jetty providing berthing and loading facilities for liquefied natural gas (LNG) carriers and bunker vessels with a carrying capacity of up to 100,000 cubic metres (m^3) for a minimum of 30 years. TMJ would transfer LNG via pipeline from the adjacent FortisBC Tilbury LNG Liquefaction Plant (Tilbury LNG Plant) to third-party owned and operated carriers and bunkers berthed at the jetty. LNG carriers would ship LNG predominantly to international markets, and LNG bunkers would ship predominantly to regional coastal markets and transport LNG to fuel other vessels. TJLP would be responsible for all shore-based marine operations at TMJ and all shore-to-ship transfer operations and procedures. The partners of the TJLP are Fortis and Seaspan affiliates.

In TJLP's Application, TJLP estimated up to 137 vessels (68 LNG carriers calls and 69 bunker vessels calls) calling on the jetty, resulting in 274 trips (inbound and outbound) annually, equivalent to approximately one vessel call every three days. In November 2021, TJLP proposed a Bunker Vessel Scenario (BVS) of up to 365 LNG vessel calls per year based on recent developments in the LNG bunkering and bunker vessel markets. As such, TJLP conducted additional analysis, which is captured in the Bunker Vessel Scenario Assessment (BVSA) Report, assessing 365 vessel calls in a year, with a vessel mix of 307 bunker vessels and 58 LNG carriers. Both the Application scenario (274 trips annually) and BVS (730 trips annually) are considered in the assessment.

TMJ is subject to an EA under B.C.'s *Environmental Assessment Act*, 2002 (the Act) by the B.C. Environmental Assessment Office (the EAO), and the *Canadian Environmental Assessment Act, 2012* (CEAA 2012) by the Impact Assessment Agency of Canada (the Agency) (formerly the Canadian Environmental Assessment Agency). On July 20, 2015, the federal Minister of Environment and Climate Change approved the substitution of the EA process to the Province of B.C. The substituted process must meet the EA requirements of CEAA 2012. The approval was granted with the understanding that the EA would be conducted by the EAO in accordance with the *Memorandum of Understanding on Substitution of Environmental Assessments (2013)* (the MOU) entered into by the Agency and the EAO.

The EAO prepared this Assessment Report in consultation with an advisory Working Group (Working Group), comprised of federal, provincial and local government representatives with mandates and skill sets relevant to the review of TMJ, as well as representatives of Indigenous Groups potentially affected by activities at the jetty site and along the shipping route (listed on Schedules B and D, in the Section 11 Order

and subsequent section 13 Orders[1]). The Agency also provided advice to the EAO in relation to fulfilling the requirements related to CEAA 2012.

The EAO undertook public consultation activities during the EA, including holding four public comment periods. All public comments, and TJLP and the EAO's responses to these comments, were considered in completing the EA.

In conducting this EA, the EAO considered potential environmental, economic, social, heritage, and health effects, including cumulative effects of other projects or activities of TMJ for the provincial EA. For the purposes of meeting the CEAA 2012 substitution requirements, the EAO also considered effects that TMJ may have on environmental effects described in subsections 5(1) and 5(2) of CEAA 2012, as well as the *Species at Risk Act* (SARA), subsection 79(2).

Assessment of Effects

The EA focused on assessing effects on the Valued Components (VCs) and pathways of effects related to air quality, greenhouse gas (GHG) management, river processes, vessel wake, water quality, fish and fish habitat, marine fish and fish habitat, marine mammals, vegetation, wildlife and wildlife habitat, marine birds, economy, socio-community, land and marine resource use, visual quality, heritage resources, human health, and noise.

The EAO assessed the potential for TMJ to have significant adverse effects on the VCs and on the requirements of CEAA 2012, including effects of TMJ on the environment that could affect Indigenous peoples, and included an assessment of the effects TMJ could have on Aboriginal Interests. The assessment also considered how accidents and malfunctions and changes to the environment could affect the VCs and Indigenous peoples. These assessments were informed by the Application provided by TJLP as well as comments received from the Working Group, Indigenous Groups, and the public.

TJLP proposed mitigation measures to avoid or minimize the adverse effects of TMJ. In consideration of TJLP's proposed mitigation measures and the comments received during the Application review, the EAO is proposing 20 conditions, each of which includes measures to mitigate the effects of TMJ. If provincial Ministers issue an Environmental Assessment Certificate (EAC), they may establish these conditions as legally binding requirements. The EAO has also recommended Key Mitigation Measures (KMMs) under CEAA 2012, to inform federal conditions. Federal conditions are also proposed by the Agency for consideration by the federal Minister of Environment and Climate Change as legally binding conditions in a CEAA 2012 decision statement, should TMJ be approved to proceed.

The following are some of the mitigations that are included in the provincial conditions the EAO proposes to provincial ministers:

[1] https://projects.eao.gov.bc.ca/p/58851208aaecd9001b829b58/project-details

- An Indigenous Monitors plan that provides opportunities for the participation of Indigenous Groups in monitoring activities during construction and operations;
- Emergency response and spill prevention measures, including procedures to notify Indigenous Groups, the City of Delta (Delta), Metro Vancouver, and the City of Richmond (Richmond) of emergencies or spills;
- Light management at the TMJ site, including mitigating potential attraction of birds;
- Wildlife and wildlife habitat management and monitoring, including species-specific sensitive timing windows and setbacks, invasive species prevention, control and management, and monitoring of restored habitat;
- Water Quality Management Plan to manage potential adverse effects to water quality during in-water works, including a monitoring program for turbidity and an adaptive management framework;
- River Bed Monitoring Plan to mitigate potential adverse effects to the bed of the Fraser River caused by dredging during construction and operations;
- Cultural and Archaeological Resources Management Plan to mitigate and monitor potential adverse effects on archeological and cultural sites, including an Archaeological Impact Assessment, measures to prevent unauthorized access to sites, and developing and implementing chance find procedures with Indigenous Groups;
- Indigenous Training, Employment and Procurement Plan to provide opportunities to Indigenous Groups and their members;
- Indigenous cultural awareness, recognition and mitigation to promote cultural awareness and recognition and mitigation adverse effects on cultural resources or practices in the marine terminal area;
- Vegetation and Wetland Management and Wetland Offsetting Plan to control noxious weeds and invasive plants, incorporate Indigenous stewardship values related to vegetation and wildlife, establish plant species of cultural significance to Indigenous Groups, and compensate for the loss of wetlands, that would also provide additional habitat and habitat function for wildlife; and
- Air Quality Management Plan and Greenhouse Gas Reduction Plan with mitigations to reduce GHGs and adverse effects to air quality during construction and operations, including triggers and corrective actions to reduce air quality levels and GHG emissions.

The EAO is also recommending KMMs under CEAA 2012, intended to inform federal conditions, including the following:

- Fish Mitigations to Reduce Harm and Mortality, including conducting in-water work activities during reduced risk windows unless authorized by Fisheries and Oceans Canada (DFO), monitoring during

dredging activities, underwater noise mitigation and monitoring, fish habitat offset plan, and a follow up program for effectiveness of fish and fish habitat mitigations;

- Marine Mammal Management Plan, including measures to reduce underwater noise and monitoring at the TMJ site;
- Vessel Traffic Management Plan, including measures to reduce underwater noise of marine shipping, participation in the Vancouver Fraser Port Authority-led Enhancing Cetacean Habitat and Observation (ECHO) Program seasonal slowdown initiatives, and participation, where possible, in regional environmental management measures and cumulative effects monitoring to protect Southern Resident Killer Whale (SRKW);
- Marine Communication Plan to notify Indigenous Groups and other marine users of planned activities associated with TMJ, including anticipated traffic schedules, and procedures to provide feedback to TJLP on adverse effects related to navigation;
- Marine Access and Transportation Plan to coordinate and communicate with other marine users and regulators, including Indigenous monitoring during food, social and ceremonial (FSC) fisheries windows and measures to mitigate effects on Indigenous traditional use activities, such as LNG carrier call scheduling and synchronization of bunker vessels with other marine traffic on the Fraser River, to limit disruption to Indigenous fishers when operating under DFO fishing licences;
- Mitigation measure that in each calendar year, TMJ would receive a maximum of 365 LNG vessel calls, of which a maximum of 68 would be LNG carrier calls;
- Emergency Response Plan for the TMJ site, which would describe emergency response training, measures to mitigate adverse effects and operating procedures to prevent potential accidents and malfunctions, and a description of the integrated response planning, including roles and responsibilities, and equipment requirements between TJLP and government agencies, local government and emergency response departments;
- Marine Shipping Emergency Response Outreach Program which would describe the equipment TJLP could provide to assist with a marine shipping spill or emergency response associated with TMJ-related LNG vessels;
- Cultural Heritage mitigations, which would require TJLP to develop nation-specific measures to address the effects on tangible and intangible cultural losses caused by TMJ, in consultation with those Indigenous Groups experiencing the effects (as described in the EAO's Assessment Report), and to consider developing or contributing to Indigenous-led programs to preserve and enhance cultural heritage.

In addition to the requirement for an EAC, TJLP also requires various permits, approvals and authorizations which relate primarily to disturbance of land, water, fish and fish habitat, and disruption to marine navigation. Prior to the start of construction, TMJ must obtain provincial permits under the *Oil and Gas*

Activities Act; *Land Act*, *Water Sustainability Act*; *Heritage Conservation Act* (HCA); and the *Environmental Management Act*. TMJ is also subject to a variety of federal legislations, and in some cases must obtain authorizations under these Acts, including CEAA 2012, *Canada Marine Act*, *Fisheries Act*, *Canadian Navigable Waters Act*, and *Canadian Environmental Protection Act*.

In consideration of the mitigation measures that would be required of TMJ, either in an EAC or federal decision statement should TMJ be approved, or in subsequent regulatory processes, the EAO concludes that TMJ would result in residual adverse effects that include:

- Changes to ambient air quality and increased GHG emissions during operations, primarily from an increase in combustion exhaust from LNG carriers and bunker vessels, and associated vessels such as tugs and security vessels;
- Change in sediment processes, river currents and local geomorphology from dredging and propellor wash during construction and operations at the TMJ site;
- Increase suspended sediment due to dredging during construction and operations at the TMJ site;
- Fish habitat loss and alteration at the TMJ site from piles, dredging, vibrodensification and the scour protection placed in the dredge pocket;
- Potential harm to fish, including change in fish behaviour due to underwater noise during in-water works at the TMJ site and injury or mortality to sturgeon due to vessel strikes at the TMJ site and in the lower Fraser River;
- Behavioural changes and physical injury to marine mammals, including SRKW, due to underwater noise at the TMJ site and TMJ-related vessels in transit, and vessel strikes;
- Loss or alteration of wetland and riparian ecosystems at the TMJ site;
- Loss or alteration of wildlife habitat and sensory disturbance from noise and light at the TMJ site, and increased risk of wildlife mortality at the TMJ site and due to collisions with vessels and disorientation from vessel lighting for TMJ-related vessels in transit;
- Increase in potential human health effects associated with exposure to airborne contaminants via inhalation during operations;
- Increase in noise levels during construction and decommissioning at the TMJ site;
- Interference to commercial and non-commercial marine users from the TMJ site to Sand Heads; and
- Reduced visual quality due to increase in daytime visibility of the TMJ site and TMJ-related vessels and increase in nighttime visibility of the TMJ site.

In addition to the effects listed above, the EAO concluded that TMJ would result in residual adverse effects to the following CEAA 2012 factors:

- Effects on Current Use of Lands and Resources for Traditional Purposes (CEAA 5(1)(c)(iii) through effects to fish, access to fishing areas and the experience of fishing;
- Effects on Current Use for other Traditional and Cultural Uses [CEAA 5(1)(c)(ii)] and Cultural Heritage [CEAA 5(1)(c)(ii)] through access, quality of experience and, in the case of cultural interests in SRKW, through the resource itself; and
- Effects to the Health and Socio-economic Conditions of Indigenous Peoples (CEAA 5(1)(c)(i) in consideration of the views of Indigenous Groups on the potential risk of accident or malfunction, real and/ or perceived health risks associated with air, noise, visual disturbance and consumption of country foods, knowledge transmission, cultural continuity, and cultural health.

The EAO concludes that TMJ, combined with existing significant cumulative effects and future foreseeable projects and activities, would result in:

- Significant adverse cumulative effects on SRKW due to underwater noise;
- Significant adverse cumulative effects on Current Use of Lands and Resources for Traditional Purposes for fishing (CEAA 2012, Section 5(1)(c)(iii)) for Indigenous Groups that preferentially fish near the TMJ site or in the shipping lanes; and
- Significant adverse cumulative effects on Cultural Heritage (CEAA 2012, Section 5(1)(c)(ii) for all Indigenous Groups who have a cultural interest in SRKW, for Tsleil-Waututh Nation related to cultural and spiritual practices, for Musqueam related to cultural continuity and sense of place and identity, for Tsawwassen First Nation related to cultural well-being and stewardship aspirations under Tsawwassen First Nation's Treaty, and for Pacheedaht First Nation and Ditidaht First Nation related to cultural practices, language and knowledge transmission.

The EAO appreciates that there is a high level of public, government and Indigenous concern regarding public safety risks associated with LNG activities. While the consequences for public safety due the loss of containment of LNG and ignition could reach substantial distances and be very high, after mitigation, the EAO notes that the likelihood of such an event is very rare, based on TJLP's definitions used in the quantitative risk analysis. The risk analyses conducted during the TMJ EA show the individual and societal risk fall into the "Broadly Acceptable" or "Tolerable" if as low as reasonably possible ranges. There is potential for extremely rare likelihood but very high severity of consequences of accidents and malfunctions causing a SRKW fatality or irreversible damage to heritage resources, for which the residual risk is moderate, based on TJLP's definitions in the risk matrix. For potential effects of accidents and malfunctions on other environmental VCs, no significant effects are predicted effects and the residual risk level is low to moderate. Should an EAC be issued, the EAO understands that public safety risk from activities at the jetty site would be discussed further during the BC Oil and Gas Commission (BC OGC)

permitting process. For the marine navigation component, Transport Canada (TC) noted that the assessment of probability and proposed mitigation measures in the Application and supplemental information were reasonable for the marine transit risk, considering the redundant layers of safety that make up Canada's marine safety system.

Indigenous Consultation

Potential effects from TMJ, including vessel berthing, loading and de-berthing within the marine terminal area during operations, and increased levels of vessel traffic due to TMJ-related vessels transiting the navigational channel of the lower Fraser River to Sand Heads would occur in the asserted traditional territories of the Schedule B Indigenous Groups (as identified in the EAO's Section 11 Order), and downstream of the traditional territories of Katzie First Nation and the Indigenous communities represented by Stó:lō Nation, Stó:lō Tribal Council, and People of the River Referrals Office. Potential effects from TMJ-related vessel traffic along the shipping route through the Salish Sea, from Sand Heads out to 12 nautical miles (that is, approximately 22 kilometres [km] off the west coast of Vancouver Island), would occur in the asserted traditional territories of Schedule B and Schedule D Indigenous Groups (as identified in the EAO's Section 11 and 13 Orders). The EAO consulted these groups throughout the EA and assessed the potential adverse effects of TMJ on their Aboriginal Interests. Métis Nation BC (MNBC) asserts rights and traditional uses over the entire province of BC and has indicated an Aboriginal Interests associated with the proposed TMJ site. The EAO notified MNBC of key milestones during the EA to meet federal consultation agreements consistent with the MOU.

The EAO concludes that TMJ has the potential to affect Aboriginal Interests related to fishing, hunting, trapping, gathering, use of travel ways, other cultural or traditional use of marine areas or SRKW, intergenerational knowledge transfer, and archaeological and heritage resources and sites. While the area of the development for TMJ is crown land (submerged) and the upland portion of the TMJ site is located on fee simple private land that are used for industrial purposes, the EAO still assessed for potential impacts to Aboriginal title claims for some Indigenous Groups (as required). In the context of potential effects on Aboriginal Interests the EAO also considered: the importance of TMJ to the local, regional, and provincial economy; the resources or values that may no longer be available for future generations; and the benefits of TMJ to Indigenous Groups.

Conclusions

The EAO concludes that, considering the analysis and implementation of the proposed provincial conditions and recommended KMMs under CEAA 2012, TMJ would not result in significant residual adverse effects. In terms of cumulative effects, the EAO concludes that the predicted residual effects from TMJ, interacting with existing significant cumulative effects, existing projects and other reasonably foreseeable future projects, would contribute to significant adverse cumulative effects to SRKW, current

use of lands and resources for traditional purposes for fishing in the lower Fraser River and at Swiftsure Bank, and to cultural heritage for some Indigenous Groups.

PART A – INTRODUCTION AND BACKGROUND

1.0 PURPOSE OF THE ASSESSMENT REPORT

The purpose of this Assessment Report (Report) is to summarize the procedures and findings of the EA conducted by the British Columbia (B.C.) Environmental Assessment Office (EAO) for the Tilbury Marine Jetty Project (TMJ), formerly known as the WesPac Tilbury Marine Jetty Project. The EAO accepted WesPac Midstream-Vancouver LLC's Application (the Application) for a B.C. Environmental Assessment Certificate (EAC) for the TMJ on March 20, 2019. On June 11, 2020, the EAO was notified that Tilbury Jetty Limited Partnership (TJLP), as represented by its general partner Tilbury Jetty GP Inc., replaced WesPac Midstream-Vancouver LLC as the proponent for TMJ. TJLP is a partnership between affiliates of Fortis and Seaspan[2].

The EAO prepared this Report as the Assessment Report for provincial Ministers who are responsible for making a decision on TMJ under Section 17 of the B.C. *Environmental Assessment Ac*t, 2002 (the Act) and the federal Minister of Environment and Climate Change under the *Canadian Environmental Assessment Act, 2012* (CEAA 2012). During the TMJ EA, the EAO transitioned to the new *Environmental Assessment Act*, 2018, to advance reconciliation with Indigenous Groups and provide specific opportunities for consensus-seeking in the EA process. Although the TMJ EA was conducted under the 2002 Act, the EAO has integrated aspects of the 2018 Act in the TMJ EA process, including seeking consensus with Indigenous Groups. For TMJ, the deciding provincial ministers are the Minister of Environment and Climate Change Strategy (ENV) and the Minister of Transportation and Infrastructure.

On July 20, 2015, the federal Minister of Environment and Climate Change approved the substitution of the EA process to the Province of B.C. The approval was granted with the understanding that the EA would be conducted by the EAO in accordance with the *Memorandum of Understanding on Substitution of Environmental Assessments (2013)* (MOU) entered into by the Impact Assessment Agency of Canada (the Agency) (formerly the Canadian Environmental Assessment Agency) and the EAO. In accordance with the MOU, the EAO would consider the factors as set out in subsection 19(1) of CEAA 2012, including but not limited to Section 5 of CEAA 2012 when conducting the EA, gather information from Indigenous Groups about the effects of TMJ on their potential or established Aboriginal treaty rights and ways to prevent, mitigate or otherwise address those effects as appropriate, and provide an EA Report to the Agency that includes the findings and conclusions of the EA with respect to those factors. Ultimately, substitution results in one EA process designed to support separate provincial and federal EA decisions. The EAO

[2] References to TJLP includes all the consultation and engagement activities, submissions and studies conducted by WesPac Midstream-Vancouver LLC prior to the ownership transfer of TMJ.

assessed TMJ in a manner also consistent with the Agency's *Notice of Commencement of an Environmental Assessment and Substitution Approval* and Section 19(1)(f) of CEAA 2012.

The EAO will submit the EAO's Report to the Agency to inform the federal Minister's decision-making under CEAA 2012. Pursuant to paragraph 34(1)(e) of CEAA 2012, the EAO's Report will be made public at the conclusion of the EA. This Report:

- Describes TMJ, the substituted EA process, and consultation undertaken during the EA;
- Documents the work the EAO did to consult and accommodate Indigenous Groups in keeping with the Supreme Court of Canada's direction in *Haida v. Minister of Forests* and related case law;
- Documents procedural aspects of consultation with Indigenous Groups, including Métis Nation B.C. on behalf of Canada;
- Identifies the potential environmental, economic, social, health and heritage effects of TMJ, including cumulative effects and how TJLP proposes to mitigate adverse effects;
- Identifies the residual adverse effects after mitigation;
- Summarizes all environmental management plans (EMPs) and follow-up plans described in TJLP's Application for a provincial EAC and federal Decision for TMJ;
- Identifies the EAC conditions proposed by the EAO;
- Recommends Key Mitigation Measures (KMM)[3] under CEAA 2012 (Appendix 1); and,
- Sets out conclusions based on TMJ's potential for significant adverse residual effects with respect to both the Act and CEAA 2012.

In the preparation of this Report, the EAO has considered the following information:

- The Application (accepted March 2019) and supplemental information[4] provided by TJLP;
- The Marine Shipping Assessment (MSA) report provided by TJLP (December 2019);
- The BVSA report provided by TJLP (February 2022);
- Advice provided on the Application and supplemental information, MSA report and BVSA report by the Advisory Working Group (Working Group) and Indigenous Groups; and
- Input received from members of the public.

[3] The EAO has recommended KMMs to mitigate potential adverse environmental effects related to CEAA 2012 because TMJ is undergoing a substituted EA process. The EAO led consultation on the KMMs to inform the development of the federal Conditions. Recommended federal conditions are not included in the Assessment Report and, under the MOU, are developed by the Agency and submitted to the federal Minister of Environment and Climate Change Canada. The Agency shared the list of draft federal conditions with the EAO, and the EAO confirms that the Agency is proposing conditions that have been informed by the KMMs recommended under CEAA 2012 by the EAO.

[4] Alternatives Assessment Supplemental Report – Westpac Tilbury Marine Jetty Project dated November 2019 (https://www.projects.eao.gov.bc.ca/api/public/document/60a49304148b4a002330610c/download/20191127_Alternatives%20Assessment.pdf), and responses to information requests from Working Group members.

The Application, supplemental information, MSA report, and BVSA report are posted to the EAO's Project Information Centre (EPIC)[5]. The MSA report was prepared in response to the expansion of the geographic extent of the assessment for potential effects of marine shipping activities from Sand Heads to the 12-nautical mile limit of the territorial sea of Canada. The BVSA report was prepared to assess TJLP's proposed bunker vessel scenario (BVS) which considered additional bunker vessel calls on the jetty, using the same geographic scope (i.e., jetty to Sand Heads), regulatory context, assessment boundaries and baseline information as the Application. The BVS did not affect the number of vessels in the MSA (see Section 2.2.2 for more details).

1.1 READER'S GUIDE TO THE ASSESSMENT REPORT

Each Section in this Report focuses on a Valued Component (VC) and is organized in the manner described below. The EAO's methodology and residual effects characterization definitions are provided in Appendix 2.

- **Background** – contains relevant background information, primarily found in the Application, MSA and BVSA. Information related to the MSA is found under a separate heading.
- **Potential Project Effects and Proposed Mitigations Identified in the Application** – summarizes TJLP's assessment findings and proposed mitigation measures as provided in their Application, MSA, BVSA and supplemental information. TJLP's MSA findings are under a separate heading.
- **Potential Project Effects and Proposed Mitigations Identified During Application Review** – describes key issues and concerns raised by Working Group members and the public during the Application review phase. Each description of a key issue or concern is followed by TJLP's response including critical outcomes from any additional analysis. Many of the EAO's proposed conditions and recommended KMMs under CEAA 2012 (Appendix 1) are mitigations to further address the issues.
- **The EAO's Characterization of Residual Effects** – contains the EAO's objective analysis of all information received from TJLP, the Working Group and the public, and describes the EAO's understanding of residual adverse effects of TMJ in consideration: context, magnitude, extent, duration, reversibility, frequency, likelihood, and confidence.
- **The EAO's Analysis and Conclusions** – summarizes the EAO's significance determination, if applicable. Where the EAO does not conclude on significance of residual adverse effects (for example, Pathway Components such as River Processes), a reference to the applicable VC conclusions is provided.

[5] https://www.projects.eao.gov.bc.ca/p/58851208aaecd9001b829b58/documents

- **Cumulative Effects Assessment** – contains the EAO's analysis and determination of residual cumulative effects, including past, present, and reasonably foreseeable projects and activities with the potential to act cumulatively with TMJ.
- **Conclusion** – States the EAO's overall conclusion on whether TMJ would have significant adverse effects on the given VC.

2.0 PROJECT OVERVIEW

2.1 PROPONENT DESCRIPTION

The Tilbury Marine Jetty is proposed by Tilbury Jetty Limited Partnership (TJLP). Once constructed, TMJ would be owned and operated by TJLP. TJLP provides updates on TMJ at https://tilburypacific.ca.

2.2 PROJECT DESCRIPTION AND SCOPE

2.2.1 PROJECT DESCRIPTION AND LOCATION

TJLP proposes to construct and operate TMJ, a new marine jetty that would provide berthing and loading facilities for liquefied natural gas (LNG) carriers and bunker vessels with a carrying capacity of up to 100,000 cubic metres (m^3). TMJ would transfer LNG via pipeline from the existing adjacent FortisBC Tilbury LNG Liquefaction Plant (Tilbury LNG Plant) to third-party owned and operated carriers and bunkers berthed at the jetty. TMJ was assessed based on a maximum terminal throughput of 3.5 million tonnes per annum (MTPA) of LNG[6]. The Tilbury Phase 2 LNG Expansion Project (Tilbury Phase 2), which proposes to increase LNG storage capacity at the Tilbury LNG Plant, is currently undergoing a substituted EA under the provincial *Environmental Assessment Act* (2018) and the federal *Impact Assessment Act* (2019). The EAO understands that the capacity of Tilbury Phase 2 would exist regardless of TMJ, and that TMJ is not FortisBC's only path to serve LNG customers. TJLP confirmed that the existing facilities and Tilbury Phase 1 expansion (approved via provincial Order in Council) would produce LNG that would be shipped through TMJ, and that TMJ does not require any of the Phase 2 expansion to proceed. TJLP stated that the storage tank for Tilbury Phase 2 would proceed whether the TMJ is built or not, as the purpose of Phase 2 is to improve gas delivery system resiliency after recent no-flow events.

In TJLP's Application, TJLP estimated up to 137 vessel calls (68 LNG carriers calls and 69 bunker vessel calls) at the jetty, resulting in 274 trips (inbound and outbound) annually, equivalent to approximately one

[6] TMJ would have a maximum LNG throughput of 3.5 MTPA, based on TJLP's National Energy Board (NEB) export license, regardless of the number of vessel calls.

vessel call every three days. In November 2021, TJLP proposed a BVS of up to 365 LNG vessel calls per year, based on recent developments in the LNG bunkering and bunker vessel markets. As such, TJLP conducted additional analysis, which is captured in the BVSA Report, assessing up to 365 vessel calls in a year, with a vessel mix of 307 bunker vessels and 58 LNG carriers. Both Application scenario (i.e., 274 annual trips) and BVS (i.e., 730 annual trips) are considered in the assessment. Most of the LNG carriers and bunker vessels would be LNG powered. Up to 10 percent of LNG vessels may use crude-based fuel as a primary fuel source, excluding LNG bunker barges moved by tugs.

The overall vessel length of an LNG carrier would be 250 metres (m), with a deadweight tonnage (DWT) of 47,000 tonnes. In TJLP's Application, LNG bunkers were assumed to have an overall vessel length of 120 m and a DWT of 6,500 tonnes. Since the Application, TJLP identified that smaller, highly maneuverable vessels have emerged as the front-runner LNG bunker providers in the Port of Vancouver. TJLP identified two types of bunker vessels currently in development to serve the Port of Vancouver that could load at TMJ. One is an LNG-powered bunker vessel with a 7,600 m^3 LNG capacity and the second is a diesel-powered articulated tug barge[7] (ATB) with a 4,000 m^3 LNG capacity. TJLP identified that the use of smaller bunker vessels would result in a reduction in capacity from the bunker vessel assumptions in the Application, which resulted in TJLP proposing the BVS with an increase in number of bunker vessel calls needed to supply LNG in the Port of Vancouver.

TJLP stated that bunker vessels that would call at the jetty are anticipated to be purpose-built LNG bunker vessels. For the BVSA analysis, TJLP assumed that bunkers vessels would be up to 113 m in length, up to 3,500 DWT tonnes and would not require the use of tugs, which is a change from the Application. Based on the updated information of likely bunker vessels, TJLP stated that the designs of these purpose-built bunker vessels have incorporated exceptional maneuverability and station holding capability and redundancy using azimuthing thrusters. A vessel with azimuthing thrusters (a propeller mounted on a pod that can be rotated horizontally) can move more quickly in any direction or stay in one place for a longer period. In TJLP's view, the azimuthing thrusters would allow these purpose-built LNG bunker vessels that are expected to call at the jetty to operate without the need for assistance of tugs. The EAO understands that the determination on whether tugs would be required would be made by the Port of Vancouver Harbour Master under its rules and criteria. The EAO acknowledges that there is some uncertainty regarding the use of tugs; however, the EAO considers that with the assessment and analysis undertaken, conclusions of significant cumulative effects for Current Use and southern resident killer whale (SRKW) for underwater noise, and provincial conditions and recommended KMMs under CEAA 2012, that this uncertainty has been adequately considered and reflected in the referral materials.

The TMJ site would be located on Tilbury Island, adjacent to the Fraser River, approximately 21 km from the mouth of the South Arm of the Fraser River at the Sands Head Lighthouse (Sand Heads) (Figure 1). The

[7] An articulated tug barge consists of a tank vessel (barge) and a large tug that is positioned in a notch in the stern of the barge, which enables the tug to propel and maneuver the barge.

TMJ site lies between the Tilbury LNG Plant and an industrial site currently occupied by Varsteel Ltd., a steel services and supplier located southwest of TMJ. The site and surrounding lands are currently designated for heavy industrial and marine uses by Delta. Existing marine terminals in the surrounding areas include Seaspan Ferries, Lehigh Hanson Cement, Annacis Auto Terminals, and Fraser Surrey Docks.

TMJ involves onshore and offshore facilities. The onshore facilities portion would be located on easements and rights-of-way within FortisBC-owned land on Hopcott Road. The closest identified permanent residents are three farm dwellings located on 68th Street, approximately 440 m south of the TMJ site. There are no seasonal or temporary residents within one km of the site and no land-based recreational access to the site. To access the onshore facilities, TJLP would need to construct a new access road on Tilbury Road, next to and along the boundary of the property occupied by Varsteel Ltd.

The offshore facilities portion of TMJ involves 69,000 square metres (m^2) of Provincial Crown waterlots under the jurisdiction of the B.C. Ministry of Forests (FOR). A new waterlot permit for 150 m of Fraser River foreshore would be required from the B.C. Oil and Gas Commission (BC OGC). Delta has expressed the intent to rezone the waterlot portion of the TMJ site to reflect the possibility of LNG activity. The assessment of land and marine resource uses is provided in Section 8.2 of this Report. If TMJ receives an EAC and all required regulatory approvals, TJLP will operate the proposed marine jetty for a minimum of 30 years.

LNG carriers would ship LNG predominantly to international markets, and LNG bunkers would ship predominantly to local and regional coastal markets and transport LNG to fuel other vessels. Vessels carrying out TMJ-related marine shipping activities would follow the standard shipping routes and procedures along the international shipping lanes from the Sands Heads Lighthouse (Sand Heads) to the 12 nautical mile (nm) limit of Canada's territorial sea (12 nm limit). TJLP would be responsible for all shore-based marine operations at TMJ and all shore-to-ship transfer operations and procedures. TJLP would not be conducting marine shipping. Once vessels depart from the jetty, the independent vessel owners would have responsibility for navigation, transit, and incidents.

The EAO made the preliminary determination that TMJ overlaps the traditional lands of those Indigenous Groups listed below and may affect the Aboriginal Interests of those Indigenous Groups. Schedule B of the Section 11 Order dated July 24, 2015, lists the Indigenous Groups below as those requiring a deeper level of consultation:

- Cowichan Tribes;
- Halalt First Nation;
- Kwantlen First Nation;
- Lyackson First Nation;
- Musqueam Indian Band;
- Tsawwassen First Nation[8];
- Stz'uminus First Nation.
- Penelakut Tribe:

[8] Tsawwassen First Nation entered into the Tsawwassen First Nation Final Agreement ("Tsawwassen Final Agreement") with Canada and B.C. which was negotiated under the BC Treaty Commission and came into effect on April 3, 2009.

- Lake Cowichan First Nation[9];
    - Hwlitsum[10];

TMJ would be closest to the communities of Tsawwassen First Nation and Musqueam Indian Band. A Tsawwassen First Nation community is located 10 km from the TMJ site. A Musqueam Indian Band community, Indian Reserve (IR) 2, is located 13 km from the TMJ site.

Schedule C of the Section 11 Order lists the following Indigenous Groups as those requiring notification of key project milestones:

- Katzie First Nation
- Métis Nation B.C.;
- Semiahmoo First Nation;
- Squamish Nation;
- Stó:lō Nation;
    - Stó:lō Tribal Council;
- Tsleil-Waututh Nation.

[9] Ts'uubaa-asatx Nation (formerly Lake Cowichan First Nation)

[10] The EAO's reference to the Hwlitsum is not intended to signify any change in the position that the Province may have taken in other contexts in relation to the duty to consult with this group. Hwlitsum was removed from Schedule B in accordance with the Section 13 Order issued on February 14, 2018. Refer to Section 4.2 of this Report.

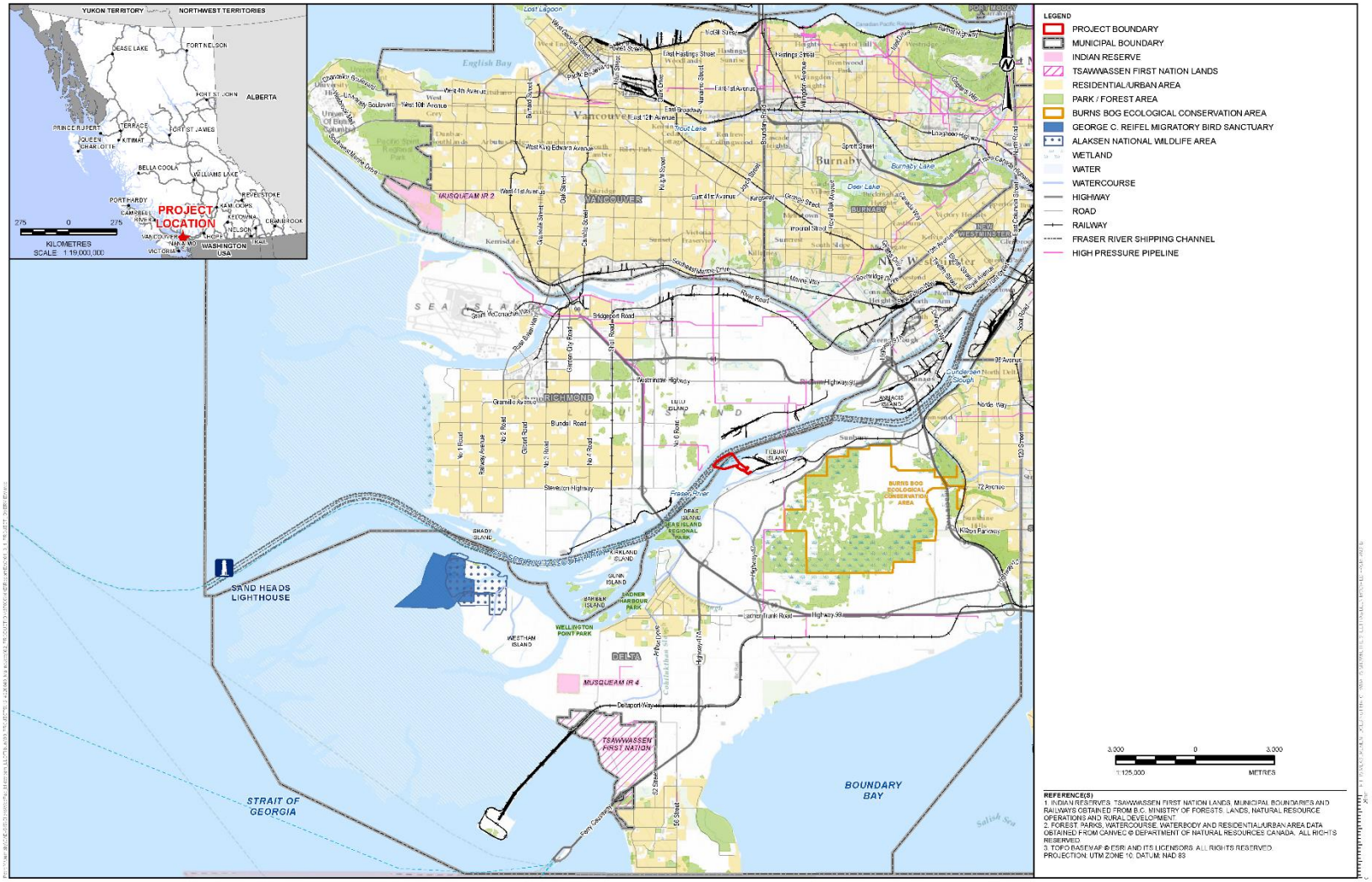

Figure 1: Location of Tilbury Marine Jetty Project

Between July 24, 2015 and January 19, 2022, the EAO issued five Orders under Section 13 of the Act to amend the Section 11 Order:

1. On September 25, 2015, the EAO issued a Section 13 Order to clarify that the Act referred to in the definition of "Aboriginal Consultation Plan" in Section 1 of Schedule A was CEAA 2012, not the *Environmental Assessment Act.* This Section 13 Order also moved Tsleil-Waututh Nation from Schedule C to Schedule B, and added the People of the River Referrals Office to Schedule C;
2. On May 11, 2016, the EAO issued a Section 13 Order to move Semiahmoo First Nation and Squamish Nation from Schedule C to Schedule B because of additional information provided by the two Indigenous Groups regarding their traditional territories, and the EAO's analysis of that additional information;
3. On February 14, 2018, the EAO issued a Section 13 Order to remove Hwlitsum First Nation from Schedule B of the Section 11 Order because of the B.C. Supreme Court's (Supreme Court) ruling in *Hwlitsum First Nation v. Canada* (BCSC 47 in April 2017) in which the Supreme Court dismissed Hwlitsum First Nation's Aboriginal title claim under Section 35 of the *Constitution Act, 1982*; and
4. On July 9, 2019, based on information provided by TJLP and recommendations of the Working Group, the Agency revised the conditions of substitution by extending the geographic scope of the assessment of effects from marine shipping activities west to the 12 nm limit and north to include the disposal at sea site near Point Grey. This extension enabled a broader assessment of the effects on the marine environment. Additional Indigenous Groups needed to be consulted because the scope extension overlaps the traditional territories of those Indigenous Groups. The EAO issued a Section 13 Order on August 6, 2019, to put into effect a new Schedule D requiring that the Indigenous Groups below be consulted on TMJ marine shipping activities:

- Ditidaht First Nation
- Esquimalt Nation
- Malahat Nation
- Pacheedaht First Nation
- Pauquachin First Nation
- Tseycum Indian Band
- Tsartlip First Nation
- Tsawout First Nation
- T'Sou-ke (Sooke) First Nation
- Maa-nulth First Nations[11]:
    - Huu-ay-aht First Nations;
    - Ka:'yu:'k't'h'/Che:k'tles7et'h' First Nations;

[11] Huu-ay-aht First Nations, Ka:'yu:'k't'h'/Che:k'tles7et'h' First Nations, Toquaht Nation, Uchucklesaht Tribe and Ucluelet First Nation entered into the Maa-nulth First Nations Final Agreement ("Maa-nulth Final Agreement") with Canada and B.C. which was negotiated under the B.C. Treaty Commission and came into effect on April 1, 2011.

- Scia'new (Beecher Bay) First Nation
- Songhees Nation
  - Toquaht Nation;
  - Uchucklesaht Tribe; and
  - Ucluelet First Nation

5. On January 19, 2022, the EAO issued a Section 13 order to add Snuneymuxw First Nation to Schedule B and kʷikʷəƛ̓əm (Kwikwetlem) First Nation to Schedule C for the remainder of the EA, related to the BVSA.

Part C of this Report describes the Aboriginal Interests of Indigenous Groups listed in Schedules B, C and D of the Section 11 Order and potential TMJ effects on these Aboriginal Interests.

2.2.2 DESCRIPTION AND LOCATION OF MARINE SHIPPING AREA FOR ASSESSMENT

On July 9, 2019, the federal Minister of Environment and Climate Change expanded the geographic extent of marine shipping for the purposes of assessing environmental effects from marine shipping activities associated with vessel movements in the MSA area. The EAO reflected this expansion in a Section 13 Order issued on August 6, 2019, in which the geographic extent of marine shipping was expanded from Sand Heads at the mouth of the Fraser River to the 12 nm limit (that is, approximately 22 km off the west coast of Vancouver Island). This expansion was in response to comments raised by the Working Group regarding potential effects associated with marine shipping beyond the boundaries established in the approved Application Information Requirements (AIR) document issued by the EAO on November 29, 2016. Vessels bound for existing ports in the Fraser River and for other Canadian and US ports enter and exit the shipping lanes in the Juan de Fuca Strait north of Cape Flattery at "Buoy J", located at the western edge of the Salish Sea (Figure 2). The outbound shipping lane is located on the Canadian side of the Canada/ US border. The inbound shipping lane is located on the American side of the Canada/ US border. The Canadian and US coast Guards jointly manage ship traffic in this transboundary waterway.

The MSA Report is a supplemental report to the Application submitted by TJLP, in response to a formal request made by the EAO. The MSA Report provides additional details on the care and control of vessels, including relevant information regarding contractual arrangements and assess potential interactions between activities associated with marine shipping and applicable VCs and Pathway Components (PC) within the spatial and temporal boundaries described in this Report. The expansion of the geographic extent applies to the MSA and is not an extension of the spatial boundaries described in the Application. Rather, the spatial boundaries of the expanded MSA are considered separate from the Application and include additional study areas.

The MSA relied on baseline information collected and assessment already completed for the Trans Mountain Expansion Project (TMX) and Roberts Bank Terminal 2 Project (RBT2). The TMX and RBT2 projects provided substantial baseline information on existing marine environmental and human

environmental conditions along B.C.'s south coast and completed assessments including a review of regional cumulative effects associated with shipping. The MSA also drew on existing publicly available data and analytical assessments completed as part of the TMX and RBT2 Projects, including Panel[12] review transcripts, other public sources, and input from the Marine Shipping Working Group.

In the MSA, TJLP assessed an operating scenario of 118 LNG vessel round trips annually (approximately 68 LNG carrier and 50 bunker vessel round trips) through the MSA Area. TJLP has advised to the EAO that, despite the change in bunkering and bunker vessel markets, the estimated number of annual TMJ-related LNG vessel round trips in the MSA Area remains at 118, consistent with the MSA. As such, TJLP conducted the BVSA on the variation in vessel traffic that may be experienced in the lower Fraser River (i.e., original Application area).The EAO understands that although the ratio of LNG carrier and bunker vessel trips in the MSA Area may change from what was considered in the MSA, the number of LNG carrier round trips would be no more than 68. At the request of the EAO, TJLP provided justification, including bunker vessel displacement analysis, to verify TJLP's predictions that there would be no change in TMJ-related vessel traffic compared to what was assessed in the MSA.

2.2.3 PROJECT COMPONENTS

TMJ would involve two main components, the floating temporary bunker berth/ platform (FTBB) and the permanent marine tandem jetty (PMTJ) (Figure 3). Below is a summary description of the FTBB and PMTJ. The Application provides more details on these components as well as on the proposed ancillary structures and facilities associated with TMJ, and systems for operation monitoring, vessel traffic control, security, lighting, water treatment, fire protection, and emergency management. Waste water generation is not anticipated for TMJ; therefore, waste water treatment is not a component of TMJ.

Floating Temporary Bunker Berth/ Platform

TJLP proposed to construct the FTBB prior to the construction of the PMTJ. The FTBB would be a temporary off-shore structure made up of a floating platform, approximately 12 m wide and 18 m long, and two berthing dolphins[13] that would connect to the shoreline via a FTBB trestle. The new temporary trestle would provide access from the existing stub dock to the FTBB. To anchor the FTBB trestle and floating platform, 18 temporary piles would be installed. The FTBB would be constructed upstream of the

[12] On January 7, 2014, the federal Minister of Environment and Climate Change announced the referral of the proposed RBT2 for an EA by an independent review panel.

[13] A mooring dolphin is a man-made marine structure that extends above water and is not connected to shore. A mooring dolphin is installed to provide a fixed structure when it would be impractical to extend the shore to provide a dry-access facility for mooring. Dolphins typically consist of several piles driven into the seabed and connected above the water level to provide a platform or fixed point. Access to a mooring dolphin may be via a pedestrian bridge.

proposed site for the PMTJ. The FTBB would supply LNG bunker vessels until the PMTJ is commercially operational. The FTBB is expected to be in operation for three years while the construction on the PMTJ proceeds. Once the PMTJ is operational, TJLP intends to decommission and remove the temporary FTBB platform and trestle via barge. Temporary piles would also be removed.

Permanent Marine Tandem Jetty (PMTJ)

The PMTJ would be a physical structure made up of two berths, one for carriers and the other for bunker vessels. Each berth would be approximately 20 m wide and 22 m long and include mooring dolphins and berthing dolphins. Piles would be installed to support the berths, main trestle and mooring dolphins. The two berths would be connected to each other by a platform. In turn, the platform would be connected to the onshore LNG transfer piping system by a main trestle, up to 300 m in length and 4 m wide. Section 1.1.5.1 and Figure 1.0-3 of the Application provide more details on the design components of the main trestle and platforms. Once construction on the PMTJ is complete, the combined two-berth structure would accommodate vessels of up to 250 m long and 38 m wide.

2.2.4 PROJECT ACTIVITIES

The temporal boundary is defined as the life of TMJ, which involves three phases: construction, operations and decommissioning. For the effects assessment, the temporal boundaries are as follows:

- Construction: 3 years;
- Operations: a minimum of 30 years; and
- Decommissioning: 1 year.

Section 1.1.6 of the Application provides more details on key activities.

CONSTRUCTION

Proposed on-site and off-site construction activities for the construction of the FTBB and the PMTJ are expected to begin as early as 2023 if TMJ is granted an EAC and all applicable permits and approvals. Early construction activities are expected to occur predominantly outside the established navigational channel in the Fraser River. Key activities during construction are summarized below:

Site Preparation

- Establish laydown area;
- Removal of existing abandoned marine infrastructure in the water lot;
- Vegetation clearing;
- Construction of a construction dock;
- Dredging of the approach channel and berth pocket. During construction, capital dredge, approximately 50,000 m^3 of sediment, would be dredged for construction of the FFTB within a

1.7 hectare (ha) area. Approximately 460,000 m^3 of sediment would be dredged for construction of the permanent marine jetty within a 20.4 ha area. Estimated volumes and frequency of maintenance dredging would depend on actual sediment deposition rates;
- Ground stabilization works for both onshore and offshore facilities to meet post-seismic requirements;
- Construction of the jetty and LNG transfer pipeline; and
- Implementation of erosion and sediment control measures.

Temporary Works

- Construction of temporary roads and detours for TMJ access;
- Construction of a temporary dock for the transport of materials and equipment;
- Dredging of the FTBB construction area;
- Installation of temporary piles to support the FTBB structures; and
- Installation of cryogenic hose auxiliary supports for the FTBB.

Construction of the PMTJ and LNG Transfer Pipeline

- Installation of the main trestle bridge, berthing dolphins, mooring dolphins, pile support, catwalks, bunker platforms and deck; and
- Installation of the jetty and LNG transfer pipeline, vapour return pipe, re-circulation line, loading arms, pipe rack system, lighting, control systems, and supporting utilities.

OPERATIONS

The FTBB would operate until the permanent PMTJ becomes commercially operational. During the operations of the FTBB[14], followed by the operations of the PMTJ, activities would involve:

- Navigation of vessels using the commercial shipping route from Juan de Fuca Strait, to Haro Strait, Boundary Pass, Strait of Georgia, mouth of the Fraser River, and then to TMJ;
- Berthing of LNG carriers and LNG bunker vessels at the jetty;
- Transfer of LNG from FortisBC to LNG carriers and LNG bunkers using the proposed TMJ loading system;
- Maintenance dredging; and
- Pilotage which would follow the Port of Vancouver TCZ-4 Guidance.

[14] The FTBB would only supply LNG bunkering vessels.

Navigation

While the navigation of vessels is not a component of TMJ, navigation is an aspect of marine shipping for which the EAO noted a high level of public and Working Group interest. For this reason, navigation was assessed as part of the EA and a summary of navigation is included in this Report.

TJLP views TMJ as a key link in the LNG supply chain on the Pacific, facilitating the loading of LNG from FortisBC's adjacent Tilbury LNG facility onto purpose-built bunker vessels and LNG carriers. This integrated supply chain relies on multiple partners in the global supply chain working closely together to supply LNG to the end customer.

Longer-term commercial agreements with LNG bunker or LNG export customers provide supply chain certainty to the partners involved. These commercial agreements specify the requirement to develop annual delivery plans for LNG. These annual delivery plans set out the timing and frequency with which LNG carriers or bunker vessels would call at TMJ and these plans would be based on the availability of LNG from FortisBC's Tilbury LNG facility, the operational requirements of the TMJ as well as numerous other commercial considerations contained within the commercial agreements.

The TMJ is operationally limited to loading one vessel with LNG per day, on average, to an annual maximum of about 365 calls. Annual LNG carrier calls would be limited to 68 and the TMJ's maximum throughput capacity is 3.5 MTPA of LNG. Based on these operational limits, TJLP considers a maximum annual operating scenario to involve 58 LNG carrier calls and 307 bunker vessel calls. This is the maximum scenario because it involves the greatest number of vessel calls, while still meeting the maximum annual throughput capacity.

LNG carriers calling at the jetty would use the principal commercial shipping route starting at the Juan de Fuca Strait, continuing through Haro Strait, Boundary Pass and the Strait of Georgia to the entrance of the Fraser River, and up the Fraser River to the jetty. The first pilot boarding location is at the Fairway Buoy Pilot Station off Brotchie Ledge, Victoria. TMJ LNG carriers would be piloted by a BC Coasts Pilot from this pilot station to Sand Heads Pilot Station located at the entrance of the Fraser River. At Sand Heads, the BC Coasts Pilot would disembark, and a Fraser River Pilot would board the carrier and continue to navigate the vessels to the jetty to ensure safe navigation in the Fraser River. Tugs operated by qualified tug operators would escort the LNG carriers to berths at the jetty. On departure, carriers would be pulled off the berth using a tug assist. Vessel operators must comply with all applicable national and international safety requirements and Vancouver Fraser Port Authority (VFPA) guidelines while the vessels are on the Fraser River or at the jetty.

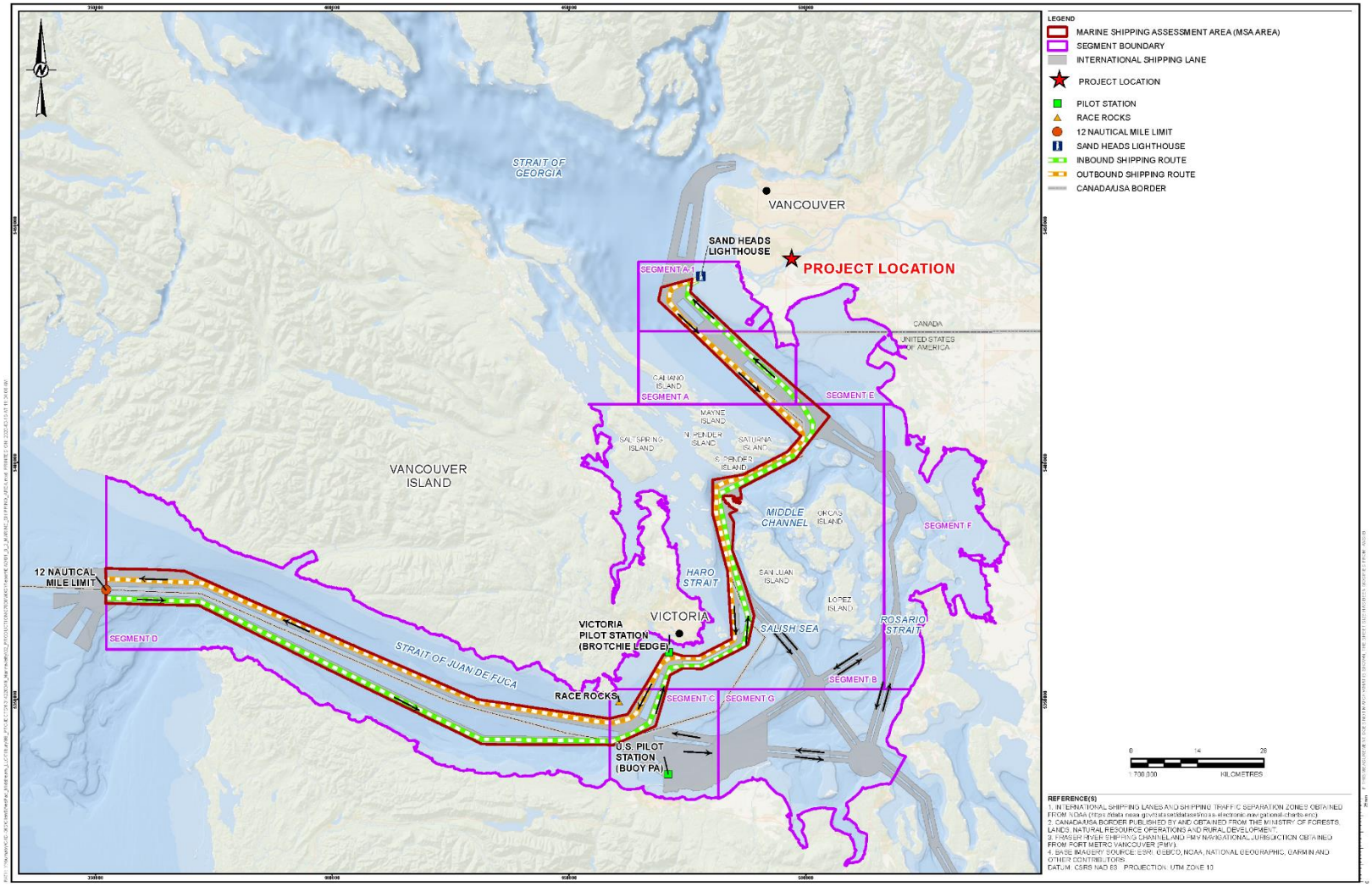

Figure 2: Location of Marine Shipping Area for Assessment.

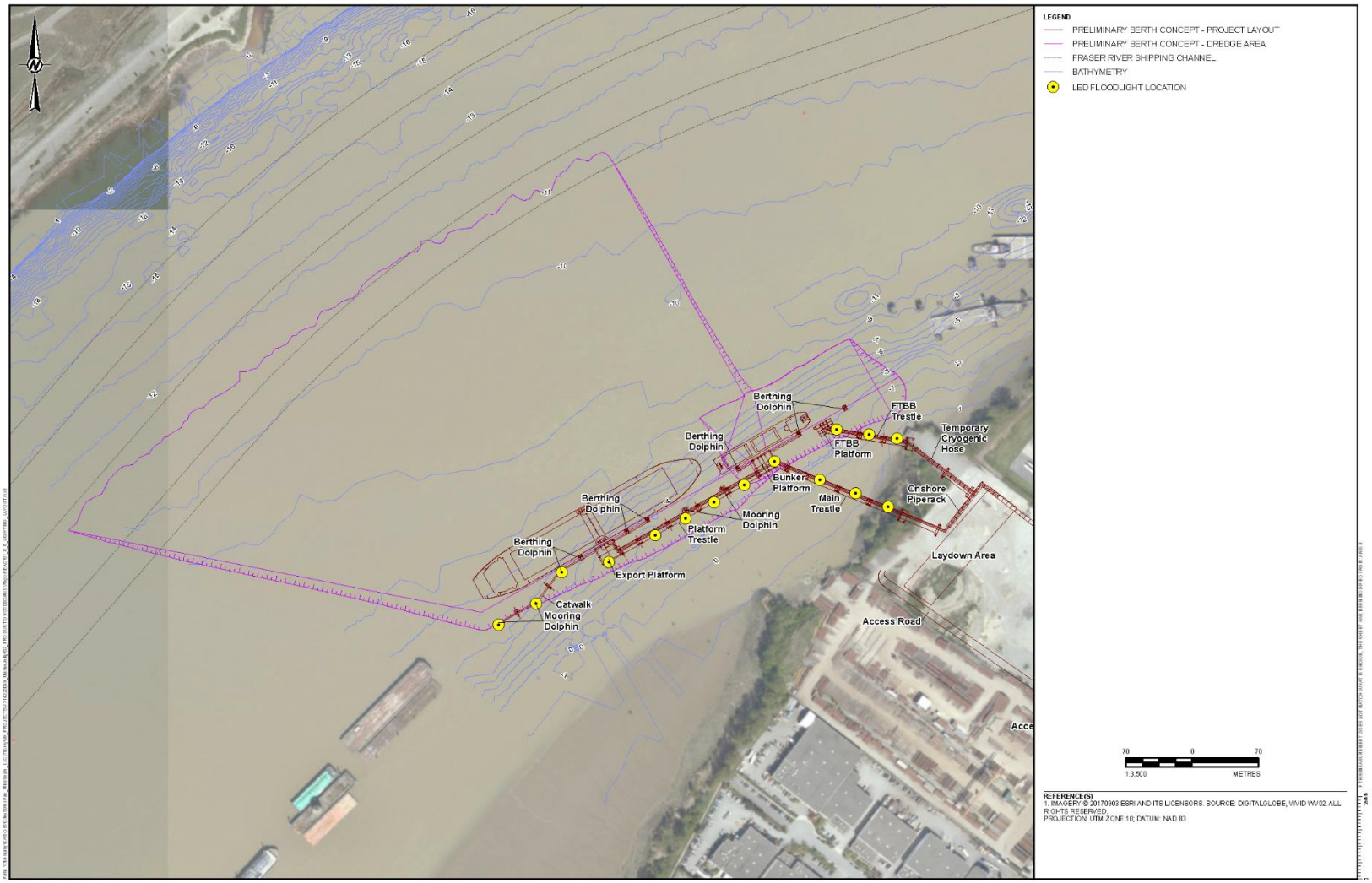

Figure 3: Location of Tilbury Marine Jetty Project Components

LNG carriers would arrive at TMJ at scheduled intervals in respect of a predictable and reliable global supply chain. These intervals would ensure that the upstream supply of natural gas to FortisBC's Tilbury LNG facility, the production and storage of LNG at the facility and the offloading of LNG to the receiving terminals is well coordinated. The consistency of the intervals would also ensure that no part of the supply chain is required to shut down or modify their operations as a result of inconsistent deliveries.

In the Application scenario of 68 LNG carrier calls a year, loading would take place roughly once every five days. A typical transit schedule would allow 48 hours for an LNG carrier to transit the Fraser River.

Bunker vessels calling at the jetty would use the principal commercial shipping route to access non-regional markets (i.e., external of the Salish Sea). A portion of bunker vessels are expected to service regional markets and could travel in and outside of the established shipping lanes to deliver LNG as fuel to ships visiting Vancouver and regional ports. In contrast to the LNG carriers, the bunker vessels would not require a pilot in the Salish Sea.

The loading period for an LNG carrier is approximately 16 hours. The loading period for bunker vessels would be complete in up to 7-8 hours and while these smaller vessels would not require the same buffer times as LNG carriers, their departures and arrivals may be affected by the same complexities such as changing weather, tides or other concerns.

DECOMMISSIONING

Decommissioning would involve the dismantling and removal of all onshore and offshore facilities and structures. Decommissioning would also include the installation of foreshore slope protection, restoration and re-vegetation to prepare the site for future use.

2.2.5 ALTERNATIVE MEANS OF UNDERTAKING THE PROJECT

PROJECT DESIGN

The Application describes the process through which TJLP evaluated alternate design options for the jetty. TJLP selected the design described in the Application because, overall, TJLP concluded that it would result in greater navigation safety and loading operations safety, and lower environmental effects. The Application indicated that TJLP provided information to Schedule B Indigenous Groups (prior to the establishment of Schedule D) on alternate project designs and configuration options early in the consultation process. Comments received by TJLP were incorporated into refining the TMJ project design.

TJLP determined that the alignment of the main trestle described in the Application would provide more direct routing over the riverbed thereby reducing disturbance to soil stabilization,

pile driving and shading. The alternative option would have resulted in a greater disturbance footprint in the riparian area.

In developing the current option, TJLP considered alternative modes of transporting LNG fuel to bunker and export markets including road and rail in addition to marine options to transport LNG from the FortisBC Tilbury LNG Plant. Marine transport was selected to transport LNG to export markets as it is the most efficient method of transportation that has the capability to export LNG across the ocean to off-shore LNG markets.

Marine transfer of LNG fuel to the local bunker market was selected by TJLP as this mode is consistent with the existing method of fueling ships. Currently, ships typically load fuel from the water side of the vessel while at berth or while anchored off-shore. TJLP noted that a marine-based fuel transportation system is required to meet the current fueling system while alternative methods of delivery would require changes to the regional fueling systems.

TJLP considered LNG transport via roads to local and/ or regional ports; however, TJLP noted this option is not consistent with the typical fuel delivery system currently implemented in the region. Further, TJLP considered road transportation of large quantities of LNG using the public road system presents logistical challenges resulting in a less efficient and economical delivery system.

MARINE SHIPPING ROUTE ALTERNATIVES

The MSA Report concluded that there is no practical alternative marine route to the one described in the MSA Report. A marine emergency is the only foreseeable reason for which re-routing an LNG carrier would be necessary. Alternate routes would involve passage via Puget Sound, and the American passage would require US and Canadian pilotage. TJLP concluded that such alternate routes were not viable because of expense and pilotage.

ALTERNATIVES TO THE PROPOSED PROJECT

TJLP considers TMJ, as described in the Application, the only viable project option. The location proposed for TMJ was selected because of its proximity to the existing, and operational, FortisBC Tilbury LNG Facility (built in 1971). The FortisBC Tilbury LNG Facility currently supplies natural gas to local residents as well as to local and export markets. TMJ provides a means to deliver LNG to regional and global markets. Further, the selected TMJ site is designated for heavy industrial use and has been historically modified, reducing the potential effects to natural environmental resources. Any other alternatives involving a different location would not be situated near a pre-existing liquefaction facility and therefore would require the development of a new LNG facility in a greenfield site and additional natural gas pipelines and related infrastructure.

DREDGE DISPOSAL

Section 1.3.3 of the Application describes potential benefit uses and disposal options for marine sediment that would be dredged from the Fraser River's bed. Preliminary sediment sampling conducted by TJLP indicates that dredged material from the construction and operation of TMJ would be similar to the dredged material routinely removed as part of the navigational dredging program in this section of the Fraser River. Given the similarity, TJLP expects that dredged material from TMJ could be used for fill and construction purposes. TJLP notes that the ultimate means of disposing the dredged material would be influenced by the market demand for dredged material and the needs of regional projects during the TMJ construction. Depending on suitability, TJLP might reuse a portion of the dredged materials within the TMJ area for shoreline restoration.

In the Application, TJLP proposes to apply to Environment and Climate Change Canada (ECCC) for a Disposal at Sea (DAS) Permit under the federal DAS Regulations to dispose the material at sea if a beneficial use for the dredged material cannot be identified. If the dredged material is determined to be unsuitable for either beneficial use or ocean disposal, TJLP proposes that the material be disposed at a permitted onshore disposal facility.

The Application (Section 1.3) included an assessment of alternative methods for disposal of marine sediment from dredging. During Application review, ECCC identified the following concerns with the alternatives assessment presented in Section 1.3.3 of the Application:

- Need to expand the assessment area to evaluate potential effects of transporting and disposing of dredge material to the Point Grey ocean disposal location, recognizing that the material generated by TMJ is not eligible for disposal at the Sand Heads ocean disposal location;
- Need to provide a more robust approach to the alternatives assessment; and
- Lack of selection of a preferred alternative being carried forward throughout the effects assessment.

During Application review, the EAO requested TJLP to provide additional information on the alternative options for dredge disposal, and an assessment of potential effects for each disposal option to be considered within the scope of the EA. In response, TJLP provided an *Alternatives Assessment Supplemental Report*[15] which included the Point Grey ocean disposal location as a

[15] https://projects.eao.gov.bc.ca/api/public/document/60a49304148b4a002330610c/download/20191127_Alternatives%20Assessment.pdf

fifth disposal option, in addition to the four alternatives presented in the EAC Application and provided a comparison of the potential effects to VCs associated with the five disposal options.

Potential options considered for dredge disposal were based on guidance of the *Canadian Environmental Protection Act,* 1999[16] Section 4 of Schedule 6 which provides guidance for the assessment of waste disposal options and a preferred waste management hierarchy. All practical land-based and beneficial-use alternatives to disposal at sea must be considered and evaluated before an application for disposal at sea is considered by ECCC. Potential re-use on land or into water, and disposal on land and into water were considered in the order of preference:

- Beneficial onsite use and commercial use;
- Upland disposal at an approved landfill facility; and
- Marine disposal at a previously used site pursuant to a permit under the DAS Regulations.

The *Alternatives Assessment Supplemental Report* identified the following hierarchy of dredge disposal options:

- Use as substrate for the restoration and enhancement of the existing degraded estuarian marsh and mudflat;
- Re-use onsite for construction purposes;
- Temporarily stockpiling on-site for subsequent re-use and/ or re-sale off-site;
- Disposal at an approved upland site, such as a licensed landfill; and
- Disposal at an existing ocean disposal site, such as Sand Heads or Point Grey, subject to the terms and conditions of a DAS Permit.

The following five dredge disposal alternatives were considered within the scope of the EA:

- **Alternative 1**: Construction Material for Habitat Creation and Enhancement;
- **Alternative 2**: Commercial Upland Use;
- **Alternative 3**: Land-based Disposal;
- **Alternative 4**: Marine-based Disposal at Sands Heads DAS site; and
- **Alternative 5**: Marine-based Disposal at Point Grey DAS site.

The *Alternatives Assessment Supplemental Report* noted that the preferred options for dredge disposal are beneficial commercial upland uses and/ or disposal at a landfill facility; however, marine disposal of the dredge material cannot be excluded at this time. Given that the potential land-based location(s) and markets for commercial upland uses of the dredge marine sediments

[16] https://laws-lois.justice.gc.ca/eng/acts/c-15.31/

are unknown at this time, the assessment of dredged sediment disposal considers both marine and land-based alternatives. The TMJ may require a combination of the alternative marine and land-based dredge disposal methods, rather than relying on one disposal method alone.

The EAO considered five dredge disposal alternatives identified in the *Alternatives Assessment Supplemental Report* in its conclusions for relevant VCs in this Report. Table 34 (Appendix 3) provides a summary of these alternatives and potential effects to VCs associated with each dredge disposal method.

The *Alternatives Assessment Supplemental Report* noted that the final selection of dredge disposal methods and locations would depend on commercial market demand for sand at the time of dredging, and physical and chemical characteristics of the dredge material. Several of the alternative dredge disposal options may be required. Possible dredge disposal scenarios considered in the alternatives assessment include:

1. The preferred scenario would be no disposal at sea. This would result in 5 percent of dredge material from the capital dredge going to beneficial reuse for habitat restoration/ enhancement, 10 percent going to upland disposal, and 85 percent going to commercial sand sales; and 100 percent of materials from maintenance dredging going to commercial sand sales;
2. The least preferred dredge disposal scenario would be no material going to commercial sand sales. This would result in 5 percent of dredge material from the capital dredge going to beneficial reuse for habitat restoration/ enhancement, 10 percent going to upland disposal, and 85 percent going to disposal at sea; and 100 percent of materials from maintenance dredging going to disposal at sea; and
3. The most likely scenario is a portion of the dredge materials going to both commercial sand sales and disposal at sea.

Scenario 3 was carried forward for further analysis based on an estimated volume of dredge materials going to commercial sand sales (40 percent) and disposal at sea (60 percent). Over the past five years, Fraser River Pile and Dredge has disposed of approximately 3.4 million m^3 of sediment from the annual navigational channel maintenance dredge program at a ratio of 40 percent commercial sand sales and upland disposal sites to 60 percent ocean disposal. This ratio was conservatively used in the alternatives assessment as the estimated distribution for dredge disposal from the TMJ site.

During the Application review, ECCC clarified that dredge material identified as suitable for disposal at sea at Sand Heads or Point Grey (Alternatives 4 and 5) requires the concentrations of metals and organic parameters to meet the Lower Level Limits specified in the DAS Regulations under the *Canadian Environmental Protection Act*. During the Application review, ECCC has clarified that the Sand Heads disposal at sea site (Alternative 4) is only used for the

disposal of sand from the lower reaches of the Fraser River navigation channel maintenance dredging program. The sand goes through additional chemical analysis to ensure that the activity would not harm SRKW critical habitat. The alternatives assessment noted that ECCC has indicated that the material generated by TMJ is not eligible for disposal at Sand Heads (Alternative 4). Therefore, as noted in the alternatives assessment, TJLP selected Point Grey (Alternative 5) has been selected as the likely preferred disposal at sea site.

The Point Grey Disposal Site is located outside the of SRKW critical habitat. However, to transit from the TMJ area to the Point Grey Disposal Site, the dredge vessel and tug assisted barges would need to travel through SRKW critical habitat.

The alternatives assessment noted that capital dredging (construction phase) and annual maintenance dredging (operations phase) would be completed during the least risk fisheries work window specified by DFO (that is, June 16 – February 28). Where possible, maintenance dredging would be limited to the months of December to February when white sturgeon is least likely to be present or migrating through the Fraser River. However, in-water construction activities are expected to require more than 3 months to complete. Most of the capital dredging is expected to be conducted using a trailer suction hopper dredge (80 percent) with the remainder using a hopper clamshell dredger (20 percent). This assumption was used to estimate the number of vessel trips to receiving locations for each of the five disposal alternatives. Sediment within the lower Fraser River is dredged annually by both dredge methods to maintain the navigational shipping channel.

2.3 PROJECT BENEFITS AND PURPOSE

ECONOMIC BENEFITS OF TMJ

This section summarizes the estimated economic benefits of TMJ during construction, operations, and decommissioning, as reported in the Application. The capital costs for TMJ are estimates and would be revised during the preliminary and detailed design phases. More details are in Section 8.4 (Assessment of Economic Effects) of this Report.

ECONOMIC BENEFITS FROM TMJ CONSTRUCTION

Table 1 summarizes the estimated annual economic benefits from TMJ construction, as reported in the Application. Depending on the final project configuration, the total construction cost for TMJ would range between $154 million and $260 million, of which, approximately $106.7 million would go to B.C. and $93.5 million to Metro Vancouver over the five-year construction period.

***Table 1: Summary of Estimated Annual Economic Benefits from TMJ Construction* ($million)**

	LAA (Metro Vancouver)	BC[1]
Gross Output		
Direct	18.7	21.3
Indirect	5.7	10.1
Contribution to Gross Domestic Product (GDP)		
Direct	not calculated	4.6
Indirect	12.2	17.0
Labour Income		
Direct	4.4	4.4
Indirect	8.7	11.9

[1] B.C. estimates include LAA estimates.

During construction, an estimated total of $22.8 million in tax revenues would be generated, $10 million to the federal government, $9.8 million to the provincial government, and $3 million to the local governments. Table 2 is a summary of the estimated annual average tax revenues to government.

Table 2: Summary of Estimated Annual Average Tax Revenues to Government

Average Tax Revenues from TMJ Construction ($million) [1]	LAA (Delta)[2]	BC	Federal
Direct	0.2	0.5	0.9
Direct Suppliers	0.2	0.7	0.8
Indirect	0.1	0.2	0.5
Induced	0.1	0.1	0.2
Total	**0.6**	**1.7**	**2.3**

[1] The individual estimates are rounded to once decimal point, and therefore do not add to the presented total.

[2] Economic benefits in the form of property taxes.

Table 3 summarizes the estimated total construction employment opportunities (Full-time equivalents [FTEs]) that might be created by TMJ[17]. TJLP estimates that TMJ would create a total of 1,083 FTEs in B.C. over the four-year construction (276 direct FTEs, 407 direct supplier FTEs, 271 indirect FTEs and 129 induced FTEs). A large portion of job opportunities would be created in the local communities within Metro Vancouver in the engineering construction industry. According to the Application, there would be a total of 852 FTEs in Metro Vancouver

[17] Based on the model used for this assessment, Person years and FTEs are synonymous in this context. In the model used for this analysis, one FTE is considered 1,750 hours per year to account for vacation and statutory holidays.

of which 276 FTEs would be direct employment opportunities, and 340 FTEs would be direct supplier, 161 indirect and 76 induced employment opportunities in the Local Assessment Area (LAA) communities within Metro Vancouver. TJLP expects 126 FTEs in direct employment would be needed in the first year of construction, during peak construction, when the construction of the FTBB and PMTJ would take place at the same time.

***Table 3: Estimated Total Employment during TMJ* Construction**

	Metro Vancouver Person-Years (FTEs)	BC (FTEs)
Direct[18]	276	276
Direct Supplier[19]	340	407
Indirect	161	271
Induced	76	129
Total Employment	**852**	**1,083**

ECONOMIC BENEFITS FROM PROJECT OPERATIONS

The Application estimates that TMJ would spend between $3.6 million and $6.6 million annually, or $86.3 million to $160.1 million over the operational life of TMJ. Much of the costs would be incurred for maintenance dredging and tug escorts.

According to the Application, approximately seven direct FTEs would be required during operations. Economic benefits through indirect and induced employment during operations are anticipated to be negligible because employment opportunities during operations would be filled by existing Fortis employees. The average annual wage for direct employees is expected to range between $89,000 and $166,600. During operations, TJLP, their suppliers and contractors would continue to pay tax to the federal, provincial and local governments.

Direct annual operational expenditures ($3.6 million to $6.6 million), employment and labour income would result in very small annual changes in goods and service contracting opportunities and in direct and indirect output, labour income, GDP and government revenue from income tax, corporate tax, and taxes on products – relative to that of the provincial and local (Metro Vancouver) economy.

ECONOMIC BENEFITS FROM TMJ DECOMMISSIONING

The Application states that capital spending during decommissioning would be dependent on

[18] Number of job opportunities created for the construction of the Project on the Tilbury site.

[19] Number of job opportunities created by suppliers who would supply goods, materials and services for and during construction (for example, transportation and warehousing, manufacturing, technical services).

the labour required to remove all TMJ infrastructure, foreshore restoration, and maintenance. At this time, the Application states it is not possible to accurately predict the baseline labour supply and demand conditions in the LAA in 30 years when the decommissioning of TMJ is expected to begin. TJLP anticipates very few new direct and indirect job opportunities would be created. All TMJ-related employment would cease when decommissioning is complete. After TMJ ceases to operate and the infrastructure is fully dismantled and removed from the site, economic benefits to local governments would return to levels similar to those under baseline conditions.

PROJECT CONTRIBUTIONS TO BUSINESS DEVELOPMENT

TJLP anticipates that TMJ would contribute to procurement opportunities for businesses. Goods and services revenues for direct supplier industries in B.C. due to project spending for constructing TMJ is estimated to be $132.8 million over the four-year construction. Of this amount, $106.7 million is expected to go to goods and services revenues for B.C. businesses. The highest share of the direct supplier revenue is expected to be in engineering and construction services. Local businesses are expected to realize $122 million in goods and services contracting revenues due to TMJ over the construction. Additional spending is expected to benefit economies in other parts of Canada and internationally. Total household spending related to operations, over the life of TMJ, ranges from an estimated $86.3 million to $160.1 million.

COMMUNITY, ECOLOGICAL AND SOCIAL BENEFITS OF THE PROJECT

This section summarizes TJLP's perspective on the community, ecological and social benefits of the TMJ, as reported in the Application and during the EA.

With access to international shipping lanes and with navigation and safety regimes developed for marine LNG bunkering and export bulk LNG carriers, TJLP views TMJ as being well-placed to bring environmental, societal and economic benefits to B.C. While the TMJ is a relatively small-scale project on the world-scale, in TJLP's view, TMJ would resolve a vital infrastructure challenge in the LNG supply chain on Canada's west coast. Providing low carbon intensity LNG to ships and overseas customers would enable meaningful emissions reductions, and other environmental benefits as well as economic benefits for B.C. Without the TMJ in place and delivering LNG to customers, TJLP believes the local and regional environmental benefits would not be realized and this newer generation of LNG-powered vessels would be more likely to serve other ports.

TJLP stated that LNG remains a vital fuel to reduce emissions in sectors that are difficult to decarbonize such as global shipping and industrial processes. According to TJLP, TMJ would support the Port of Vancouver in its ambition to create the world's most sustainable port and

open up B.C.'s natural resources to markets that need low-carbon energy to displace coal. By providing LNG from the Tilbury LNG Plant as a marine fuel and as a fuel to displace coal, TJLP considers TMJ as a significant step in reducing greenhouse gas emissions and air pollution locally and overseas and represents an important economic opportunity. TJLP notes that TMJ can offer LNG from the Tilbury LNG Plant, which has lower facility carbon intensity than does the global average LNG because it is powered by electricity from renewable sources, mainly hydroelectricity. A study commissioned by TJLP for TMJ has shown LNG from the Tilbury LNG Plant could reduce GHG emissions in ships by up to 22 to 27 percent compared to conventional marine fuel, depending on the type of marine engine used. FortisBC is a provider of renewable natural gas (RNG), a carbon neutral form of energy that can be used as a drop-in fuel to lower carbon intensity even further. With respect to the Tilbury LNG Plant, TJLP confirmed that TMJ would make use of existing capacity from the Tilbury LNG Plant, and that TMJ does not require any of the Phase 2 expansion to proceed and that the storage tank for Tilbury Phase 2 would proceed whether the TMJ is built or not.

According to TJLP, TMJ would generate the following potential benefits:

- **Improving air quality**: Providing LNG as a lower-emission alternative to oil-based marine fuel in the Port of Vancouver would reduce harmful air pollutants and improve human health
- **Reducing GHG emissions**: Providing LNG as a lower-carbon alternative to oil-based marine fuel or coal would reduce emissions and support government climate targets
- **Reducing oil spill risk**: Reducing the potential for oil spills by displacing the use of oil in the Port of Vancouver with LNG
- **Encouraging newer, cleaner ships**: Attract the new LNG-powered vessels being built and deployed around the world that meet the latest emission reduction and vessel safety standards. These vessels would feature technology to improve efficiency and reduce underwater noise
- **Supporting fish and fish habitat**: Supporting the recovery of chinook, eulachon and sturgeon in the Fraser River and Salish Sea by providing funding to the First Nations Fisheries Legacy Fund, a program led by several Indigenous groups,
- **Habitat compensation**: restoring wetland areas impacted by past industrial practices to create a net gain of this type of habitat
- **Scientific studies**: providing new information and understanding of the Fraser River through new studies in cooperation with Indigenous groups and ongoing programs to monitor the river and manage potential impacts

Improving air quality: The Port of Vancouver sees over 3,100 vessel calls each year along with harbour tugs and dredging vessels, which currently use diesel or marine fuel oil. The global shipping fleet is increasingly moving to LNG-powered vessels in response to International Marine Organization (IMO) sulphur emission regulations that came into effect in 2020, and progressive greenhouse gas emission regulations that are coming in the years ahead. Until recently, almost all ships were fuelled by heavy oil or marine diesel oil, which emit high amounts of air pollutants compared to cleaner burning LNG. For example, based on LNG demand forecasting reported by the Port of Vancouver, a 1-million tonne LNG market in the Port of Vancouver supplied by TMJ could reduce air pollutants by more than 500 tonnes locally each year and more than 90,000 tonnes globally each year as ships travel to and from other ports.

Reducing greenhouse gas emissions – Shipping: An estimated 90 percent of the world's goods are moved by sea, and maritime trade is expected to triple by 2050. According to the IMO, international shipping is a significant source of global GHG emissions and accounted for about 2.9 percent of the total global anthropogenic carbon dioxide (CO_2) emissions in 2018. The IMO has set a target to reduce international shipping CO_2e emissions intensity (from 2008 levels) by at least 40 percent by 2030 and 70 percent by 2050, with an initial strategy for absolute annual GHG emissions reduction of 50 percent by 2050. TJLP asserts that TMJ can support this target by delivering LNG from the Tilbury LNG Plant.

A study commissioned by TJLP for TMJ has shown that LNG from Tilbury could reduce GHG emissions, in ships by up to 22 to 27 percent compared to conventional marine fuel, depending on the type of marine engine used. According to the VFPA, approximately 70 percent of the global fleet uses the two-stroke marine diesel engine type that lead to lower GHG emissions and a greater GHG advantage for LNG than do four-stroke engines.

This same study shows that a 1-million tonne per year LNG market in the Port of Vancouver supplied by TMJ could materially reduce global GHG emissions when including the ships' journeys to and from other ports, depending on the type of marine engine used. TJLP believes that TMJ would unlock the potential for GHG emissions reduction by enabling a ship-to-ship bunkering service for ocean-going vessels in the Port of Vancouver.

TJLP believes that there are opportunities to further reduce lifecycle LNG emissions in B.C. These include the implementation of the provincial government's CleanBC plan, federal methane regulations and other policy and industry initiatives to electrify upstream production and reduce upstream production emissions. Lifecycle emissions could be further reduced in the future by blending renewable fuels such as biogas with LNG.

Reducing greenhouse gas emissions – Overseas: Coal is the largest source of global energy-related carbon dioxide emissions, and TJLP consider that TMJ would support the displacement

of coal by facilitating the loading of LNG onto ships for overseas customers. LNG from the Tilbury LNG Plant has a lower facility carbon intensity than does the global average LNG and could have a greater potential, than LNG from other producers, to reduce emissions. FortisBC has been exporting LNG from the Tilbury LNG Plant via International Organization for Standards (ISO) shipping containers and is seeing increased interest in B.C. LNG from Asian markets. If the use of Tilbury LNG were to displace the use of coal by its customers it would lead to a significant decrease in their customers' lifecycle greenhouse gas emissions.

Reducing oil spill risk: In 2019, nearly 200,000 tonnes of marine fuel was burned in the Port of Vancouver. If spilled, this fuel becomes pollution in the marine environment penetrating the skin of marine life, and depending on the scale of a spill, potentially a long and costly clean up. TJLP believes that TMJ would help reduce the risk of oil spills by displacing conventional marine fuel with LNG. The properties of LNG make it a less harmful fuel compared with oil. LNG is non-toxic so in the unlikely event of a spill, LNG would quickly vaporize leaving no residue behind on the water or on land. However, TJLP acknowledges that in more than 60 years of LNG shipping there has never been a major accident or spill involving a ship.

Encouraging newer, cleaner ships: In response to IMO emissions targets, the global shipping fleet is increasingly switching to LNG-powered vessels and ports worldwide are developing infrastructure to fuel them. In 2021, 209 LNG vessels were ordered, more than the previous seven years combined. In addition to LNG-powered engines, these ships are featuring some of the latest technology to improve efficiency, reduce emissions and underwater noise. The benefits from the new generation of vessels are going to those ports that have the infrastructure in place to fuel them, which highlights the need for the TMJ.

Supporting fish and fish habitat: TJLP is proposing to make a $2 million contribution to the First Nations Fisheries Legacy Fund[20], a fish restoration initiative led by several Indigenous groups , to help address the underlying concern of reduced fish stocks including eulachon, sturgeon and chinook. Increases in chinook salmon stocks would support the recovery SRKW, which rely on chinook as their primary source of food.

Habitat compensation: The existing foreshore in the area near the TMJ has been disturbed by past industrial activity. TJLP stated that TMJ is designed to have a limited impact in the existing riparian and foreshore area, and that there is an opportunity to develop habitat enhancement

[20] TJLP's proposal for Unconventional Offsetting Accommodation for Residual Project and Cumulative Effects, dated July 5, 2021 (https://www.projects.eao.gov.bc.ca/api/document/61099898cd98620022b0832b/fetch/20210707_TilburyJettyLimitedPartnership_UnconventionalOffsetProposal.pdf).

at the site. The opportunity could include the creation of an estuarian marsh and mudflat habitat in the area.

Scientific studies: TJLP would be required to undertake environmental monitoring and follow-up programs to verify the accuracy of the environmental assessment. TJLP notes that these programs could have the added benefit of improving understanding of the Fraser River ecosystem. In addition to these programs, TJLP is committed to conduct broader studies of issues of importance to Indigenous Groups on the Fraser River. For example, TJLP conducted an eulachon spawning study of the Fraser River in 2021 and is preparing for a broader eulachon study in 2023 in partnership with Indigenous Groups on the Fraser River. These studies are expected to be the beginning of ongoing work supported by TJLP that would provide new information and improve understanding of the Fraser River, such as delineation of fish spawning habitat and movement patterns, through new studies in cooperation with Indigenous groups and ongoing programs to monitor the river and manage potential impacts.

The EAO understands that TJLP are continuing to engage Indigenous Groups regarding broader studies, which are outside the scope of the EA.

3.0 AUTHORIZATIONS

In addition to needing an EAC, TJLP would need various authorizations from federal, provincial and local governments. TJLP is not applying for concurrent permitting under the Act.

3.1 FEDERAL REGULATORY ENVIRONMENT

Prior to the start of construction, TJLP must obtain federal authorizations summarized in Table 4.

Table 4: Required Federal Authorizations

Name of Authorization	Statute (Authorizing Agency)	Reason for Requirement
Vancouver Fraser Port Authority (VFPA) authorization	*Canada Marine Act* SC 1998, c.10	The TMJ site is within the VFPA's navigational jurisdiction.
Environmental Assessment Decision	*Canadian Environmental Assessment Act, 2012* (CEAA 2012)	TMJ, as proposed, is a designated physical activity as it meets the definition of paragraph 24(c) of the *Regulations Designating Physical Activities* of the CEAA 2012.
Section 35.1(2)(b) Fisheries Authorization (DFO)	*Fisheries Act,* RSC 1985, c. F-14 (DFO)	Proposed dredging activities, disturbance of a riparian area, and construction of jetty infrastructure may result in harmful

Name of Authorization	Statute (Authorizing Agency)	Reason for Requirement
		alteration, disruption or destruction of fish habitat within the meaning of the *Fisheries Act.*
Section 15(3) Approval(s)	*Canadian Navigable Waters Act* (Transport Canada [TC])	The proposed construction and operations of the marine jetty infrastructure, and ancillary activities (including dredging and fish habitat offset works, FTBB) being located on the Fraser River have the potential to obstruct/ impede navigation and may need approvals under the *Canadian Navigable Waters Act*.
Disposal at Sea Permit	*Canadian Environmental Protection Act, 1999* (Environment Canada and Climate Change)	TMJ activities may include marine disposal of dredge material during construction and operations.

3.2 PROVINCIAL AUTHORIZATIONS

Prior to the start of construction, TMJ must obtain provincial authorizations summarized in Table 5 in addition to an EAC.

Table 5: Required Provincial Permits and Approvals

Name of Authorization	Statute (Authorizing Agency)	Reason for Requirement
Environmental Assessment Certificate	*BC Environmental Assessment Act, 2002* (EAO)	TMJ is a reviewable project under Reviewable Projects Regulation, Part 8, Table 3.
Pipeline Permit	*Oil and Gas Activities Act and Regulation* SBC 2008, c.36 (BC OGC)	TMJ, as proposed, requires a permit for the 470 m pipeline.
Crown Licence of Occupation	*Land Act* RSBC 1996, c.245 (BC OGC)	Oil and Gas Commission is the decision-maker on and responsible for the issuance of land tenures for Crown land available for oil and gas activities. TMJ, as proposed, requires a involves a new waterlot lease extending 150 m along the Fraser River shoreline.
Section 11 Approval	*Water Sustainability Act* SBC 2014, c.15 (BC OGC)	TMJ, as proposed, involves activities in and around a stream including dredging, clearing, foreshore modification activities.
Heritage Investigation Permit	*Heritage Conservation Act* RSBC 1996, c.187 (FOR, Archaeology Branch)	TMJ, requires a Heritage Investigation Permit to undertake systematic study and data recovery from an archaeological site.
Heritage Inspection Permit	*Heritage Conservation Act* RSBC 1996, c.187 (FOR, Archaeology	TMJ, as proposed, requires archaeological inspections to support the EA on non-federal land, and to conduct systematic

Name of Authorization	Statute (Authorizing Agency)	Reason for Requirement
	Branch)	study and data recovery from an archaeological site.
Site Alteration Permit	*Heritage Conservation Act* RSBC 1996, c.187 (BC OGC)	TMJ, as proposed, may involve the alteration of an archaeological site.
Waste Discharge Authorizations	Waste Discharge Regulation under the *Environmental Management Act* SBC 2003, c.53 (BC OGC)	TMJ, as proposed, involves the discharge of waste into the environment.
Section 25(2) permit	Environmental Protection and Management Regulation under the *Oil and Gas Activities Act* SBC 2008, c.36 (BC OGC)	TMJ, as proposed, involves the disturbance of wildlife and wildlife habitats. BC OGC considers the intent of Government's Environmental Objectives specified in Part 2 of the Environmental Protection and Management Regulation in making a decision on whether to issue a permit for oil and gas activities.

3.3 LOCAL GOVERNMENT AUTHORIZATIONS

TMJ is required to apply for a rezoning of the water lot portion of the TMJ site once the EAC is issued. As part of the Delta rezoning process, a review of servicing and diking requirements would be conducted. Prior to the start of construction, TMJ must obtain a building permit and a Development Permit for the Streamside Protection and Enhancement Development Permit Area from Delta.

4.0 ASSESSMENT PROCESS OVERVIEW

4.1 OVERVIEW AND SCOPE OF THE ENVIRONMENTAL ASSESSMENT

The EAO determined that TMJ is a shoreline modification project and subject to review pursuant to Part 5 (Table 9), of the Reviewable Projects Regulation because construction of TMJ would result in changes to at least 2 ha of foreshore or submerged land, or a combination of foreshore and submerged land, below the natural boundary of the Fraser River. Table 6 summarizes major milestones reached during the EA for TMJ.

TMJ is also subject to a federal EA as it meets the definition of paragraph 24(c) of the *Regulations Designating Physical Activities* under CEAA 2012, as follows:

> ***24*** *The construction, operation, decommissioning and abandonment of a new*
>
> > ***(c)*** *marine terminal designed to handle ships larger than 25 000 DWT unless the terminal is located on lands that are routinely and have been historically used as a*

marine terminal or that are designated for such use in a land-use plan that has been the subject of public consultation.

Table 6: Major Milestones of the EA

Date	Milestone
Apr 30, 2015	TJLP submitted their Project Description for TMJ to the EAO and the Agency.
May 6, 2015	The EAO issued a Section 10(1)(c) designating TMJ as reviewable and requiring an EA. TMJ is a shoreline modification project that would result in changes to at least two hectares of foreshore or submerged land, or a combination of foreshore and submerged land, below the natural boundary of the Fraser River, and subject to review pursuant to Part 5, Table 9, of the Reviewable Projects Regulation.
May 14, 2015	The EAO wrote a letter to the Agency requesting for substitution for the EA of TMJ under CEAA 2012.
Jul 10, 2015	The EAO received a letter from Minister Aqlukkaq, federal Minister of Environment, approving the request for substitution for the EA of TMJ.
Jul 10, 2015	The Agency posted the *Notice of Commencement of an Environmental Assessment and Substitution Approval* for TMJ on the federal Canadian Impact Assessment Registry at https://iaac-aeic.gc.ca/050/evaluations/document/129572
Jul 24, 2015	The EAO issued a Section 11 Order to specify the scope of the roles and responsibilities of TJLP and the EAO including requirements for public consultation and Indigenous consultation.
Sep 25, 2015	The EAO issued an Order under Section 13 of the Act to: • Make an administrative change to the definition of "Aboriginal Consultation Plan" in Section 1 of Schedule A; • Move Tsleil-Waututh Nation from Schedule C to Schedule B; and • Add the People of the River Referrals Office to Schedule C.
Nov 6, 2015	TJLP submitted an updated Project Description for TMJ to the EAO and the Agency.
Nov 20, 2015 to Dec 21, 2015	The EAO held a 30-day Public Comment Period on the draft Valued Components Selection document. The Public Comment Period included two open houses, one on December 2, 2015 in the City of Delta, and the other on December 3, 2015 in the City of Richmond.
May 11, 2016	The EAO issued a second Order under Section 13 of the Act to further amend the Section 11 Order to: • Move Semiahmoo First Nation from Schedule C to Schedule B; and • Move Squamish Nation from Schedule C to Schedule B.
Nov 29, 2016	The EAO issued the approved Application Information Requirements (AIR) to TJLP. The AIR establishes information that must be collected, analyzed and included as part of TJLP's Application for an EAC.
Feb 14, 2018	The EAO issued a third Order under Section 13 of the Act to remove Hwlitsum First Nation from Schedule B of the Order issued under Section 11 of the Act.
Jul 5, 2018	TJLP submitted an update to the Project Description to refine the project design for TMJ.
Oct 16, 2018	The EAO received TJLP's Application for an EAC for TMJ. The EAO began the 30-day Application screening process
Nov 15, 2018	The EAO advised TJLP in a letter that the Application received on October 16, 2018 did not satisfactorily reflect requirements specified in the approved AIR. The EAO did not accept the Application for a detailed EA review.
Feb 15, 2019	The EAO received a revised Application (https://projects.eao.gov.bc.ca/p/Tilbury Marine Jetty Project-tilbury-marine-jetty/docs) from TJLP.
Mar 15, 2019	The EAO approved the revised Application for a detailed EA review.
Mar 20, 2019	The EAO initiated the 180-day assessment of the Application under Section 16(1) of the Act.

Date	Milestone
Jul 9, 2019	The federal Minister of Environment and Climate Change required additional information under subsection 14(3) of CEAA 2012 regarding the expansion of the geographic extent of the assessment for potential effects of marine shipping activities to the 12-nautical mile limit of the territorial sea of Canada.
Jul 30, 2019	TJLP submitted a letter to the EAO requesting a temporary suspension of the EA review under Section 24(2) of the Act to provide additional time to conduct studies required to prepare a Marine Shipping Assessment Supplemental Report.
Aug 6, 2019	The EAO granted TJLP's request for a temporary suspension of the 180-day time limit for the EA review under Section 24(2) of the Act. The suspension was effective on day 139 of the 180-day review period.
Aug 6, 2019	The EAO issued a fourth Order under Section 13 of the Act to require: • Expansion of the marine shipping scope of include the assessment of effects of marine shipping activities from TMJ's marine terminal to the 12-nm limit of Canada's territorial sea; • Addition of Indigenous Groups for consultation as described in a new Schedule D; and • Establishment of a new Marine Shipping Working Group.
Nov 15, 2019	The EAO issued TJLP an Information Request for the supplemental assessment memo to consider potential marine shipping activities within the expanded geographic extent described by Canada.
Dec 9, 2019	TJLP submitted to the EAO the TMJ Marine Shipping Assessment Report.
August 5, 2021 to September 7, 2021	The EAO held a public comment period on a draft of its decision materials, prior to referral to Ministers.
September 17, 2021	The EAO determined that TJLP satisfied the requirements necessary to lift the suspension and resumed the timeline at day 139 of the Application review period.
November 23, 2021	TJLP submitted a letter to the EAO, informing the EAO that additional analysis is proposed to assess a bunker vessel scenario with more annual vessel calls than assessed in the Application.
December 2, 2021	The EAO issued a Section 24(4) Order under the Act, to extend the Application review time limit.
January 19, 2022	The EAO issued a fifth Order under Section 13 of the Act to further amend the Section 11 Order to: • add Snuneymuxw First Nation to Schedule B and • add kʷikʷəƛ̓əm (Kwikwetlem) First Nation to Schedule C.
May 18, 2022	TJLP submitted to the EAO the final TMJ Bunker Vessel Scenario Assessment Report
July 14, 2022 to August 15, 2022	The EAO held a public comment period on the revisions to the draft decisions materials, prior to referral to Minsters.
October 11, 2022	The EAO issued a Section 24(4) Order under the Act, to extend the Application review time limit.
October 11, 2022	The EAO referred TMJ to Ministers for decision on whether to issue an EAC under Section 17 of the Act.

4.2 ROLE OF THE ADVISORY WORKING GROUP

The EAO established a Working Group made up of federal, provincial and local government staff or representatives with the mandates and expertise relevant to the review of TMJ, as well as representatives of potentially affected Indigenous Groups listed on Schedules B of the Section 11 Order. Refer to the list of Working Group members in Appendix 4: List of Working Group Members.

The EAO sought and considered advice from the Working Group to understand and assess the potential adverse effects associated with TMJ. Working Group members were responsible for providing advice to the EAO on:

- Key EA documents including, but not limited to, the selection of VCs, AIR, Application, the EAO's Report and proposed EAC conditions and recommended KMMs under CEAA 2012;
- Marine Shipping Assessment Report;
- Bunker Vessel Scenario Assessment Report;
- TJLP's *Alternatives Assessment Supplemental Report*;
- Government policy direction and/ or gaps that could affect the conduct of the EA;
- Potential conflicts with the legislation and/ or regulations of their organizations;
- EA information requirements as compared with permitting design and information requirements; and
- Technical issues that were raised by the public during the public consultation process.

The following local governments participated in the Working Group:

- City of Delta (Delta);
- City of Richmond (Richmond); and
- Metro Vancouver Regional District.

The following federal departments with specialist information or expert knowledge relevant to TMJ participated in the evaluation and the review of TJLP's Application:

- The Agency provided guidance and information directly to the EAO regarding the substituted process and federal EA requirements under CEAA 2012. The Agency also provided guidance and information directly to the EAO regarding the expanded geographic extent for the MSA;
- DFO provided comments and information related to its regulatory and statutory responsibilities within the themes of fish and fish habitat and marine mammals;

- Health Canada (HC) provided advice and information related to its regulatory and statutory responsibilities regarding human health, with a primary focus on Indigenous health;
- ECCC provided comments and information related to its regulatory and statutory responsibilities within the themes of vegetation, wildlife, marine mammals, water quality, human health, cumulative effects, air quality, GHG management, accidents and malfunctions and Aboriginal Interests;
- Port of Vancouver provided comments and information related to its regulatory responsibilities within the themes of dredging and navigation; and
- Transport Canada (TC) provided comments and information related to its regulatory and statutory responsibilities within the themes of ensuring the navigability of the Fraser River and marine shipping.

The EAO reviewed the adequacy of TJLP's responses to all comments received from Working Group members during the review of the draft AIR, Application, MSA Report and BVSA Report, and held various meetings with Working Group members to discuss outstanding issues and concerns. In the development of this Report, proposed provincial conditions and recommended KMMs under CEAA 2012, the EAO considered all comments and issues raised during the EA. Snuneymuxw First Nation were added to Schedule B of the Section 11 Order on January 19, 2022 and were invited to participate in the development of its Part C chapter in collaboration with the EAO, participate on the Working Group for the remainder of the EA related to the BVSA, review and comment on TJLP's BVSA Report, the EAO's Assessment Report, Summary Assessment Report, draft Certified Project Description, proposed provincial conditions, and the recommended KMMs under CEAA 2012.

During the EA, the EAO received requests from Working Group members regarding the use of vessel technology mitigation for TMJ-related vessels to mitigate effects to air quality and GHGs and underwater noise. For vessel technology mitigation, TJLP communicated the limitations of TJLP's care and control of the vessels to the EAO, the Agency and TC, including that TJLP do not expect to have any commercial agreements with shipowners or builders, and would not have control of the design of vessels. TJLP also expressed their perspective that requirements for ships / shipping (e.g., vessel technology) should be applied across the sector and not on specific projects. TJLP further noted that based on TC statements it understands that vessel technology including vessel quieting technology is an ongoing area of research and development. The TMJ proponent notes that they have not yet signed any contracts with LNG customers and so cannot discern at the EA stage what the commercial implications would be of various vessel/shipping requirements through contracts. The EAO engaged with the Agency and TC and acknowledge that TJLP's perspective is reasonable. As such, the EAO has recommended KMM's under CEAA 2012 that are within the care and control of TJLP for a Vessel Traffic Management

Plan and Air Quality Management Plan, which are described in more detail in the Marine Mammal (Section 5.7) and Air Quality (Section 5.1) chapters, respectively.

During the EA, several Working Group members expressed concerns about regional cumulative effects, particularly in the lower Fraser River and Salish Sea. The EAO received requests from Working Group members that federal and provincial governments conduct regional environmental assessments for the Fraser River estuary and Salish Sea, and for that information to be used to develop a long-term environmental management plans for the Fraser River Delta and Salish Sea to guide future conservation efforts and sustainable development in the region. The EAO has identified the broader, regional concerns raised by Working Group members with provincial ministries.

4.3 ROLE OF THE MARINE SHIPPING WORKING GROUP

The Section 13 Order issued on August 6, 2019, established the EAO Marine Shipping Working Group, an advisory sub-committee of the Working Group made up of representatives of Indigenous Groups identified in Schedule B and Schedule D, and federal, provincial and local government agencies. The purpose of the Marine Shipping Working Group was to provide input as requested by the Project Assessment Lead on aspects of the EA regarding matters related to potential adverse effects that may result from the movement of TMJ-related vessels along the marine shipping channel to and from the pilot station at Sand Heads to the 12-nm limit of Canada's territorial sea.

4.4 INDIGENOUS CONSULTATION

On May 15, 2015, the EAO issued an Order establishing the scope and procedures of the EA (Section 11 Order) which specified the consultation activities that both the EAO and TMJ must undertake with all identified Indigenous Groups potentially affected by TMJ.

At the initial stages of the EA for TMJ, the EAO conducted a preliminary assessment to determine whether an Indigenous Group would be included on Schedule B or C of the Section 11 Order.

Indigenous Groups in Schedule B[21] of the Section 11 Order were consulted at the deeper end of the *Haida* consultation spectrum, and provided the following opportunities to participate in the EA:

- Participation in the Working Group;

[21] Schedule B Indigenous Groups are described in Section 2.2.1 of this Report.

- Participation in meetings to identify and discuss the exercise of proven and asserted Aboriginal Interests that may be affected by TMJ and potential measures to avoid, mitigate, address or otherwise accommodate effects;
- Opportunities to review and comment on key documents, including the draft Section 11 Order, draft AIR, TJLP's Application, TJLP's MSA Report, TJLP's BVSA Report, and the EAO's proposed conditions and recommended KMMs under CEAA 2012, Summary and Assessment Reports including the Aboriginal Consultation Report (Part C);
- Submission of a document outlining the Indigenous Group's views on the Summary and Assessment Reports to be included in the package of materials sent to Ministers when TMJ is referred for decision;
- Notification of key milestones such as the issuance of the AIR, acceptance of the Application for review, timing of public comment periods (including open house) – when the final Assessment Report is referred to Ministers and the resulting decision;
- Invitation to meet with the EAO to discuss any Aboriginal Interests in the TMJ area; and
- The option to submit a separate report describing the Indigenous Group's views on TJLP's EAC Application and their view on whether an EAC should be issued. If an Indigenous Group provides a separate report, the report will be included in the package of materials the EAO sends forward to Ministers for decision.

Hwlitsum First Nation was initially listed on Schedule B in the Section 11 Order. On February 14, 2018, the EAO wrote to Hwlitsum First Nation to advise that the EAO had decided to remove Hwlitsum First Nation from Schedule B of the Section 11 Order as a result of the court's decision on *Hwlitsum First Nation v. Canada (Attorney General),* 2017 BCSC 47. The EAO encouraged Hwlitsum First Nation to engage in the EA process through the public consultation process.

During the EA, the EAO received additional information with respect to the Snuneymuxw First Nation's assertion of Aboriginal rights and title in the area in which TMJ would be constructed. As such, Snuneymuxw First Nation were added to Schedule B of the Section 11 Order on January 19, 2022, for the remainder of the EA, related to the BVSA, and were provided an opportunity to review and comment on TJLP's BVSA Report, the EAO's Assessment Report, Summary Assessment Report, draft Certified Project Description, proposed provincial conditions and recommended KMMs under CEAA 2012.

Indigenous Groups in Schedule C[22] of the Section 11 Order were consulted at the lower end of the *Haida* consultation spectrum, and provided the following opportunities to participate in the EA:

- Notification of key milestones – such as the issuance of the AIR, acceptance of the Application for review, timing of public comment periods (including open houses) – when the final Assessment Report is referred to Ministers and the resulting decision;
- Invitation to meet with the EAO to discuss any Aboriginal interest in the TMJ area; and
- Invitation to review and comment on the EAO's draft Summary and Assessment Reports, including the Aboriginal consultation Report.

During the EA, kʷikʷəƛ̓əm (Kwikwetlem First Nation) expressed an interest in engaging in, and learning more about, the EA for TMJ. As such, kʷikʷəƛ̓əm were added to Schedule C of the Section 11 Order on January 19, 2022, for the remainder of the EA, related to the BVSA.

Indigenous Groups in Schedule D[23] of the Section 11 Order were consulted at the deeper end of the *Haida* consultation spectrum. The EAO provided Schedule D Indigenous Groups the following opportunities to participate in the EA:

- Participation in the Marine Shipping Working Group;
- Review and comment on TJLP's MSA Report that TJLP developed and submitted regarding potential effects from marine shipping for TMJ;
- Identify Aboriginal Interests that may be adversely affected by marine shipping activities associated with TMJ and measures to avoid, mitigate, or otherwise address or accommodate potential adverse effects on Aboriginal Interests, as appropriate;
- Opportunities to review and comment on key documents, including the EAO's proposed conditions and recommended KMMs under CEAA 2012, Summary and Assessment Reports including the Aboriginal Consultation Report (Part C); and
- The option to submit a separate report describing the Indigenous Group's views on TJLP's EAC Application and their view on whether an EAC should be issued. If an Indigenous Group provides a separate report, the report will be included in the package of materials the EAO sends forward to Ministers for decision.

[22] Schedule C Indigenous Groups are described in Section 2.2 of this Report

[23] Schedule D Indigenous Groups are described in Section 2.2 of this Report.

4.4.1 MEETING THE CROWN'S DUTY TO CONSULT AND ACCOMMODATE INDIGENOUS GROUPS

The EAO is required to ensure that the honour of the Crown is discharged by ensuring appropriate consultation and accommodation of potential effects of TMJ on the exercise of proven Aboriginal rights and asserted Aboriginal Interests in respect of the decision by Ministers as to whether to issue an EAC. Although the TMJ EA was conducted under the 2002 Act, the EAO has integrated aspects of the 2018 Act in the TMJ EA process, including seeking consensus with Indigenous Groups throughout the EA.

In accordance with the *Memorandum of Understanding on Substitution of Environmental Assessments*[24], on substituted projects, the EAO is responsible for the procedural aspects of consultation on behalf of Canada and is required to ensure that consultation is carried out in a manner consistent with Canada's determination of the scope and content of consultation. Indigenous Groups' comments and interests in terms of consultation and specific consideration of the Crown's duty of consult and accommodate Aboriginal Interests are factored into the analysis of Part C of this Report.

There is often considerable overlap between the interests of Indigenous Groups and the assessment of environmental, economic, social, heritage and health effects. Indigenous Groups' comments and interests that directly relate to the environmental, economic, social, heritage and health assessments are discussed in this Report. More details regarding consultation with Indigenous Groups are provided in Part C of this Report.

4.5 PUBLIC CONSULTATION

Public consultation is an important aspect of the EA process. The EAO required TJLP to prepare a Public Consultation Plan. The plan describes TJLP's consultation objectives and activities.

On November 19, 2015, TJLP submitted a Public Consultation Plan[25] to the EAO. TJLP designed the PCP to meet the public consultation requirements under the Section 11 Order for both the pre-Application and Application review phases of the EA for TMJ and in accordance with the Public Consultation Policy Regulation.

[24] https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/environmental-assessments/working-with-other-agencies/substitution-links/eao-ceaa-substitution-mou.pdf

[25] https://projects.eao.gov.bc.ca/api/document/5886b134e036fb01057695e4/fetch/WesPac%20Midstreams%20Public%20Consultation%20Plan%20for%20the%20proposed%20WesPac%20Tilbury%20Marine%20Jetty%20Project%20-%20November%202015%20%28Updated%20Nov%2019%2C%202015%29.pdf

4.5.1 SUMMARY OF CONSULTATION ACTIVITIES LED BY TJLP

Based on the location of TMJ, TJLP focused their public consultation activities on communities in Delta and Richmond. TJLP identified potentially affected stakeholders on the basis of proximity to the TMJ site, anticipated interest in potential effects, review of consultation activities undertaken by other proponents in the same communities, and feedback from early stakeholder consultation.

TJLP established six categories of key stakeholders:

- Federal and provincial regulatory agencies;
- Federal and provincial elected officials;
- Municipalities including elected officials and staff;
- Adjacent land owners;
- Economic development and marine organizations and users; and
- Members of the public.

Details on the six categories of key stakeholders are in Section 13 of the Application.

TJLP's Public Consultation Plan describes key activities and timelines for each of four phases: Initial engagement, pre-Application consultation, Application review consultation, and post-EA Certificate engagement. The Public Consultation Plan and all Public Consultation Reports[26] are posted on the EAO's Project Information Centre (EPIC).

INITIAL ENGAGEMENT

Initial engagement was conducted from May 2014 to June 2015, prior to and outside the formal EA process. The purpose of initial engagement was to identify key stakeholder, inform the development of project website and information brochures, and to identify preliminary concerns and questions that need to be addressed during project development.

PRE-APPLICATION CONSULTATION

TJLP consulted with key stakeholders via phone calls, meetings and other forms of communication. The purpose of pre-Application consultation was to inform the development of public consultation materials on candidate VCs, TMJ, and the scope of technical studies. During this phase, TJLP participated in the Public Comment Period on the draft VC Selection document that included two EAO-led Open Houses, one in North Delta and one in South Richmond. TJLP

[26] https://projects.eao.gov.bc.ca/api/document/5886b1b1e036fb01057695f9/fetch/Public%20Consultation%20Report%20%231%20dated%20July%202016.pdf

considered public comments received during the Public Comment Period[27] and responded to those comments in a tracking table[28]. This phase of public consultation was conducted during the formal EA process throughout Q2 2015 and Q2 2016.

Appendix A of the Application is TJLP's Record of Consultation which provides a summary of themes that TJLP understood to be main public concerns, based on comments received during the pre-Application Public Comment Period. The following are some of the themes summarized in TJLP's Table 5 in the Application that are specific to TMJ:

- Marine navigation safety;
- Cumulative effects;
- Effects on property values;
- Effects on orcas and marine mammals;
- Potential loss of farmland;
- Effects of dredging.

APPLICATION REVIEW CONSULTATION

TJLP continued to consult with key stakeholders via phone calls, meetings and other forms of communication. This phase of public consultation was conducted during the formal EA process beginning in Q2 2016. The focus of this phase in TJLP's public consultation plan was to inform the development of public consultation materials on the TMJ EAC Application. TJLP participated in the Public Comment Period on the Application that included two EAO-led Open Houses, one in South Delta and one in South Richmond. TJLP considered public comments received during the Public Comment Period and responded to those comments in a tracking table[29].

POST-ENVIRONMENTAL ASSESSMENT CERTIFICATE ENGAGEMENT

TJLP has committed in its Public Consultation Plan to providing updates and undertake information-sharing activities to inform key stakeholders and the public on issues and concerns regarding construction, operations, and decommissioning. TJLP committed to undertaking post-EAC engagement if an EAC is granted for TMJ.

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[27] https://projects.eao.gov.bc.ca/api/document/5d793fb0fa1745001ad6d1c7/fetch/WesPac%20Tilbury%20Marine%20Jetty-%20Collected%20Public%20Comments%20-%20VC%20Selection%20Document%20-%2020151221.pdf

[28] https://projects.eao.gov.bc.ca/api/document/5886b1a6e036fb01057695f6/fetch/Public%20Comment%20Period%20Tracking%20Table%20dated%20August%202016.pdf

[29] https://www.projects.eao.gov.bc.ca/api/public/document/60f83c4e4222de00226ef2e8/download/20210713_WesPac_Public%20Comments%20Tracking.pdf

THE EAO'S CONCLUSION ON THE ADEQUACY OF PUBLIC CONSULTATION

Based on consideration of TJLP's Public Consultation Plan and Reports, the EAO is satisfied with TJLP's understanding and responsiveness to public interests. Public comments from Public Comment Periods and TJLP's responses are posted on the EAO's EPIC website for the pre-Application and Application review phases.

4.5.2 SUMMARY OF CONSULTATION ACTIVITIES LED BY EAO

PRE-APPLICATION PHASE

During the pre-Application phases, the EAO held a 31-day Public Comment Period from November 20, 2015 to December 21, 2015, on the draft VC Selection document, which describes how key areas of studies were selected for assessment. During the 31-day Public Comment Period, the EAO held two Open Houses, one in South Delta on December 2, 2015 (50 attendees) and a second Open House in South Richmond on December 3, 2015 (31 attendees). A total of 791 comments were received during the Public Comment Period.

APPLICATION REVIEW PHASE

During Application review, the EAO held a 45-day Public Comment Period on the TMJ EA Certificate Application from April 2, 2019 to May 17, 2019. During the 45-day Public Comment Period, the EAO held two Open Houses, one in North Delta on April 9, 2019 (24 attendees), and one in South Richmond on April 10, 2019 (17 attendees). TJLP considered public comments received during the Public Comment Period and responded to those comments in a tracking table[30]. A total of 506 comments were received from the public during the Public Comment Period which are posted on EPIC.

Below is a summary of the key issues or themes raised by the public during the Public Comment Period on the VC Selection Document and TMJ EA Certificate Application during Pre-Application and Application review phases:

- **Project location/ siting** – Concerns that TMJ would be located close to communities along the South Arm of the Fraser River in Richmond and Delta and in a constrained waterway with active fisheries;
- **Public safety** – Concerns about accidents and malfunctions and risks to public safety and the surrounding properties;

[30] https://www.projects.eao.gov.bc.ca/api/public/document/60f83c4e4222de00226ef2e8/download/20210713_WesPac_Public%20Comments%20Tracking.pdf

- **Air quality and human health** – Concerns about emissions from TMJ and potential effects on the local airshed and human health and a concern for the LNG processes of fracking in northern B.C.;
- **Economic benefits** – Concerns that the amount of tax revenues and creation of jobs would be insufficient compared to the potential for adverse effects of TMJ. Questions about the financial viability of the LNG industry in B.C.;
- **Industrialization of the Fraser River** – Concerns that TMJ would jeopardize the overall health of the Fraser River and Fraser River estuary, including fish and marine mammals, wildlife and migratory birds, through industrial discharges to the marine environment;
- **Health of Fraser River** – Concerns that TMJ would jeopardize ongoing restoration and the overall health of Fraser River through increased marine traffic and the potential for marine spills;
- **Marine fish** – Concerns that vessel size, scour, dredging and fish habitat would affect local populations of marine fish, specifically sturgeon and salmon;
- **Effects to marine mammals** – Concerns that underwater noise and collisions with LNG carriers would have negative effects on marine mammal populations;
- **Hydraulic fracturing, greenhouse gas emissions and climate change** – Concerns about the potential environmental effects of upstream gas production and associated pipelines. Concerns about the GHG emissions from TMJ and potential effects to climate change;
- **Government oversight, regulation, compliance and enforcement** – Apprehension that under the current regulatory regime there is insufficient government oversight and regulation of LNG facilities and shipping of LNG in B.C. Concern that there would be a lack of compliance by TJLP and limited enforcement capability by the regulators to ensure compliance;
- **EA process** – Comments and questions related to the rigour of the EA process such as, technical review, neutrality of the EAO and transparency; and
- **Public consultation process** – Concerns that there has not been significant public input and that no detailed project information was available at the open houses. Questions and comments about the format and locations of the open house events. Concerns that the public comments would not be considered in the decision by the Ministers.

During Application review, the EAO held two Public Comment Periods on drafts of the referral materials. The EAO held a 30-day Public Comment Period from August 5, 2021 to September 7, 2021 on the draft Assessment Report, draft Summary Assessment Report, proposed provincial

Conditions and Certified Project Description of the Environmental Assessment Certificate, and the potential federal Conditions of the federal Decision Statement. A total of 1,816 comments were accepted from the public during the Public Comment Period which are posted on EPIC, including 134 individual comments (of which 33 were letters of support), and 1,682 letters from letter-writing campaigns. Following the BVSA Report, the EAO revised the draft referral materials and held a 30-day Public Comment Period on the updates to the draft referral materials from July 14, 2022 to August 15, 2022. The referral materials for public comment consist of the draft Assessment Report, draft Summary Assessment Report, proposed provincial Conditions and Certified Project Description of the Environmental Assessment Certificate. The EAO also prepared a "Road Map" summary document to describe the assessment and updates made to the draft referral materials since the last Public Comment Period in August 2021. A total of 3,076 comments were accepted from the public during the Public Comment Period which are posted on EPIC, including 145 individual comments (of which three were letters of support) and 2,931 letters from letter-writing campaigns.

Below is a summary of the key issues and themes raised by the public during the Public Comment Periods held on the EAO's draft referral materials:

- **Economic benefits** – Support for TMJ's potential to create jobs, investment, and other regional economic benefits;
- **Emissions reduction** – Support for LNG as a vessel fuel and its potential to reduce GHG emissions and reduce concentrations of atmospheric pollution when compared to conventional vessel fuel types, and LNG's potential to provide a transitionary fuel while greener solutions are developed; and
- **Indigenous rights and title** – Concerns about TMJ's impacts to Indigenous rights and title;
- **Economic viability** – Concerns about the long-term economic viability of TMJ;
- **Marine wildlife** – Concerns about the impacts of dredging and vessel traffic to marine life – particularly for salmon, eulachon and SRKW;
- **Cumulative effects** – Concerns about the cumulative effects from multiple projects and industrialization of the lower Fraser River region;
- **Emissions and Climate change** – Concerns about GHG emissions related to TMJ, including upstream gas production, and the consequential impacts from climate change;
- **Public safety** – Concerns about potential accidents and malfunctions and risks to public safety; and
- **EA process** – Concerns about the linkage between TMJ and Tilbury Phase 2 LNG Expansion Project, and about the neutrality and transparency of the EAO.

The Washington State Department of Ecology submitted comments to the EAO during both Public Comment Periods on the EAO's draft referral materials. The Department of Ecology commented on the priority of the rights and resources of Tribes in Washington, in particular in related to potential spills, impacts to SRKW from potential spills and underwater noise, TJLP participation in regional vessel safety and engagement forums, TJLP funding of the existing Emergency Response Towing Vessel in Washington (operating at the entrance of the Strait of Juan de Fuca), and provided broader comments encouraging international discussion between the United States and Canada on evaluation of, and agreement on, an emergency response system. The Department of Ecology also commented on the importance of community air monitoring as part of emergency response planning, and transboundary collaboration and coordination for rapid response related to any incidents in shared waterways.

4.5.3 SUPPLEMENTAL REQUESTS FOR INFORMATION DURING APPLICATION REVIEW

During Application review, the EAO requested additional reference materials and supplemental information from TJLP to support the EA. The EAO's requests for additional information were primarily driven by concerns raised and requests submitted by the public, Working Group and Indigenous Groups.

Key information that was provided to the EAO by TJLP, in addition to responses to comments raised by the Working Group, during Application review included:

- The MSA Report;
- *Alternatives Assessment Supplemental Report – WesPac Tilbury Marine Jetty Project*; and
- BVSA Report.

During Application review, TJLP's responses to the Working Group comments on the Application and supplemental information, MSA Report and BVSA Report were captured in the tracking table posted to the EPIC.

In the development of this Report, the EAO considered comments received from the public, Working Group and Indigenous Groups, and TJLP's responses to those comments.

The EAO hosted Working Group meetings during Application review where TJLP was required to respond to questions and concerns. The summary meeting notes were posted to EPIC.

All TMJ-related information was made available to the public on EPIC.

PART B – ASSESSMENT OF POTENTIAL ADVERSE EFFECTS

5.0 ASSESSMENT OF ENVIRONMENTAL EFFECTS

5.1 AIR QUALITY

5.1.1 BACKGROUND

This chapter assesses the potential effects TMJ would have on the Air Quality VC. Air Quality was chosen as a VC due to its importance to Indigenous Groups, the public, stakeholders, regulators, as well as the requirement under Section 5(1)(c) of the CEAA 2012. For the EAO's assessment of potential effects of dredgeate disposal to the Air Quality VC, refer to Section 2.2.5 (Alternative Means of Undertaking the Project) of this Report.

The Application evaluated the following air quality parameters because they are predicted to be emitted as a result of TMJ and have applicable Metro Vancouver, B.C. or federal ambient air quality criteria:

- Nitrogen dioxide (NO_2);
- Sulphur dioxide (SO_2);
- Carbon monoxide (CO);
- Fine particulate matter (PM) with a diameter of less than 2.5 microns ($PM_{2.5}$); and
- Respirable PM with a diameter of less than 10 microns (PM_{10}).

The Air Quality VC assessment supports the assessment of TMJ's effects on the Human Health VC in Section 6.1 of this Report. It is also considered in the assessments of potential effects to Socio-Community (Section 8.1), Land and Marine Resource Use (Section 8.2), Federal Lands, Other Provinces, and Outside Canada (Section 11.1), Health and Socio-Economic Conditions of Indigenous Peoples (Section 11.3), and Current Use of Land and Resources for Traditional Purposes (Current Use) (Section 11.4) of this Report.

MARINE SHIPPING ASSESSMENT

The MSA presents the potential effects of TMJ-related shipping between Sand Heads and the 12-nautical mile limit on the Air Quality VC. The MSA evaluates the same air quality parameters as the original scope.

The Air Quality MSA supports the assessment of TMJ marine shipping effects on the Human Health MSA assessment in Section 6.1 of this Report.

5.1.1.1 REGULATORY CONTEXT

The Application considered the following key regulatory requirements, guidelines, standards and Best Management Practices (BMPs) informed the scope and methods of the Air Quality effects assessment for TMJ:

- Metro Vancouver's Ambient Air Quality Objectives;
- B.C. Ambient Air Quality Objectives;
- Canadian Ambient Air Quality Standards;
- B.C. Air Quality Dispersion Modelling Guidelines; and
- Greater Vancouver Regional District Air Quality Management Bylaw No. 1082.

The Application made comparisons to the most stringent Ambient Air Quality Objectives at the time. Comparison was made to Metro Vancouver's Ambient Air Quality Objectives in the effects assessment for all compounds with the exception of one-hour and eight-hour CO which were compared with the B.C. Ambient Air Quality Objectives.

MARINE SHIPPING ASSESSMENT

The same key regulatory requirements, guidelines, standards and BMPs listed above informed the scope of the MSA with the addition of the International Convention for the Prevention of Pollution from Ships (MARPOL) Annex VI[31].

5.1.1.2 BOUNDARIES

The LAA for the Air Quality VC includes a 10 km by 10 km area centered on the TMJ site and extends along the proposed LNG shipping route, 1 km on either side (2.5 km wide in total), between the TMJ site and Sand Heads. The Regional Assessment Area (RAA) includes a 25 km (north-south) by 30 km (east-west) rectangle comprising the TMJ site and the LAA.

MARINE SHIPPING ASSESSMENT

The MSA LAA (MLAA) for the Air Quality VC extends along the shipping lanes, 5 km on either side (10 km width) between Sand Heads and the 12-nautical mile limit. The MSA RAA (MRAA) corresponds to the Salish Sea area which includes the southern part of the Georgia Strait, Rosario Strait, Middle Channel and Juan de Fuca Strait from north of Puget Sound to the 12-nautical mile limit. This is considered a separate and additional assessment area from the original scope.

[31] International Maritime Organization. 2019. MARPOL Annex VI, 2019.

5.1.2 POTENTIAL PROJECT EFFECTS AND PROPOSED MITIGATIONS IN THE APPLICATION

5.1.2.1 BASELINE INFORMATION

In the Application, the existing air quality conditions were assessed through existing ambient air quality data gathered from local and regional monitoring stations in the greater Vancouver area (Richmond South Station and Burnaby South Station), as well as Baseline Case model predictions.

The Baseline Case represents the predicted air quality conditions without TMJ but including the Tilbury LNG Plant as an existing source (including predicted emissions from the approved and proposed Phase 2 plant expansions). The maximum emissions from the Tilbury LNG Plant were included in the modelled emissions and were therefore considered very conservative. In the Application, Baseline Case modelling predictions show that the one-hour and annual SO_2 and NO_2, and one-hour and eight-hour CO were below the relevant Ambient Air Quality Objectives. Baseline Case modelling predictions for 24-hour and annual $PM_{2.5}$ and PM_{10} were well below the Metro Vancouver Ambient Air Quality Objectives. Potential effects are quantified by the changes in the predicted concentrations between the Baseline Case and Application Case (air quality after the addition of TMJ).

MARINE SHIPPING ASSESSMENT

The MSA stated that existing conditions were determined through the use of data from regional monitoring stations. The background concentrations of NO_2, SO_2, CO and PM_{10} for all averaging periods in the MSA were below the Ambient Air Quality Objectives. 24-hour $PM_{2.5}$ exceeded the objective by up to 28 percent at certain monitoring locations mainly due to forest fires in B.C. during the summer of 2018 (comparison against the Metro Vancouver Ambient Air Quality Objectives were used for SO_2, B.C. Ambient Air Quality Objectives for CO and both objectives for $PM_{2.5}$ and PM_{10} as the objectives are the same).

5.1.2.2 POTENTIAL PROJECT EFFECTS

The potential effects of TMJ on air quality were assessed in the Application through air dispersion modelling of emissions associated with operations, as the Application stated that emissions during this phase of TMJ would be the most substantial. Two scenarios were identified in the Application to represent operations: The Normal Operations Scenario which represents the typical operation at the facility (LNG carrier and bunker vessel calls and loading, security boat and tug activity as well as fugitive emissions from the pipeline) and the Dredger Operations Scenario which represents the two-week period of maintenance occurring once per year where dredging would take place at the TMJ site (no LNG vessels would call during this period).

The Application noted that the majority of emissions from TMJ in the LAA for the Normal Operations Scenario would be intermittent, short-term emissions from diesel engines on board marine vessels (one LNG carrier and associated tugs or one bunkering vessel are expected every three days) and fugitive emissions from the pipeline system. Emissions would occur from the Dredger Operations scenario during the yearly, two-week maintenance dredging period. Dredger emissions are mostly due to dredger diesel engine combustion sources.

The Application noted that predicted emissions were modelled conservatively, particularly the one-hour and 24-hour scenarios. For short term scenarios, emissions were assumed to be the worst case, that is, from the largest, diesel-powered LNG carriers. Additionally, the maximum emission rates were modelled as if they were continuous in the short term. The Application explained that 90 percent or more of vessels are expected to be LNG powered which would produce much lower emissions, particularly Nitrogen Oxides (NO_x) emissions, than diesel powered vessels. The maximum hourly emissions that were modelled for the short-term scenario would occur only while the largest, diesel-powered LNG vessels are berthing and departing, which would occur for only 0.16 percent[32] of the year. TJLP's NO_x modelling was based on emission factors provided by ECCC for carriers and tugs that were approximately 8 times and 6 times, respectively, than the IMO Tier III NO_x emission standards.

Application Case maximum NO_2 concentrations in the RAA were predicted to exceed the one-hour Metro Vancouver Ambient Air Quality Objective for a maximum of 6 hours per year (Table 7), based on modelling a diesel vessel berthing for every hour of the year[33]. The change from Baseline conditions due to the addition of TMJ maximum one-hour NO_2 predicted concentrations is up to 164 percent of the air quality objective during the Normal Operations Scenario. TMJ emissions would bring NO_2 levels from below to above the air quality objective. The area of exceedance of the one-hour NO_2 objective is in the LAA over the Fraser River and slightly onto land on the north bank of the Fraser River just north of the TMJ site boundary and contains one discrete receptor (indicating a sensitive location). Maximum predicted Application Case annual NO_2 concentrations are below Metro Vancouver's Air Quality Objective at all receptors. The change due to TMJ is predicted to be 0.16 percent of the annual air quality objective in the Normal Operations Scenario. During the Dredger Operations Scenario, one-hour NO_2 emissions are predicted to exceed Metro Vancouver Air Quality Objectives at a

[32] The Application conservatively assumed the maximum hourly emissions for berthing/ de-berthing for all 137 project vessel calls (LNG and diesel-powered vessels), resulting in the estimated maximum hourly emissions occurring for approximately 3% of the year. TJLP informed the EAO that, more realistically, the maximum hourly emission rate would only occur when diesel-powered LNG carriers with tug assist call to TMJ (68 vessel calls) which equates 0.16% of the year.

[33] TJLP informed the EAO that, more realistically, the maximum emission rates are only expected to occur during berthing and departing activities for 274 hours a year, and concentrations are predicted to be above the 1-hour NO_2 criteria less than one hour per year.

maximum of 2 hours per year affecting a small area over water on the Fraser River. Annual emissions were not assessed for the Dredger Operations Scenario as the dredging activities are planned to take place only once per year for a period of two weeks.

In the Application, CO maximum one-hour and 8-hour Application Case predictions were shown to increase slightly from the Baseline while remaining well below both the one-hour and 8-hour Metro Vancouver Ambient Air Quality Objectives in both the Normal and Dredger s scenarios. The change due to TMJ was equivalent to approximately 3 percent and 2.5 percent of the one-hour and 8-hour objectives respectively in both the Normal and Dredger Operations Scenario.

Maximum predictions for SO_2, $PM_{2.5}$ and PM_{10} were predicted in the Application to remain below both the relevant one-hour, 24-hour and annual Metro Vancouver Ambient Air Quality Objectives for both the Normal and Dredger Operations Scenarios. For SO_2, the change due to TMJ was shown to be negligible at the maximum prediction location in both the one-hour and annual scenarios. For PM, the change due to TMJ for short term (that is, 24-hour) was equivalent to a maximum of 26 percent and 14 percent of the $PM_{2.5}$ and PM_{10} objectives respectively. TMJ effects on annual concentrations at the maximum prediction was shown to be negligible.

A summary of the maximum predicted concentrations of NO_2, SO_2, CO, $PM_{2.5}$ and PM_{10} in the RAA is presented in Table 7 for both the Normal Operations and Dredger Operations scenarios.

Table 7: Summary of the maximum predicted air concentrations in the RAA

Air Quality Parameter	Averaging Period	Ambient Air Quality Objective (µg/m³)	Predicted Maximum Baseline Case (µg/m³)	Predicted Maximum Application Case (µg/m³) (Baseline Case plus change due to TMJ)	Predicted Max Number of Exceedances (Objective Exceedances/ year)
NO_2	one-hour	200	95.8	**Normal*: 423.2**	**6**
				Dredger: 407.4**	**2**
	Annual	40	25.8	Normal: 26.8	0
SO_2	one-hour	183	20.0	Normal: 20.0	0
				Dredger: 20.0	0
	Annual	13	1.5	Normal: 1.5	0
CO	one-hour	14,300	858	Normal: 1,304	0
				Dredger: 1,329	0
	8-hour	5,500	725	Normal: 860	0
				Dredger: 855	0
$PM_{2.5}$	24-hour	25	17.8	Normal: 23.4	0
				Dredger: 24.4	0
	Annual	8	6.2	Normal: 6.2	0
PM_{10}	24-hour	50	23.3	Normal: 29.5	0
				Dredger: 30.4	0
	Annual	20	10.1	Normal: 10.1	0

Bold text indicates Metro Vancouver Air Quality Objective exceedances.
*Normal Operations Scenario represents the typical operation at the facility (LNG carrier and bunker vessel calls and loading, security boat and tug activity as well as fugitive emissions from the pipeline).
**Dredger Operations Scenario represents the two-week period of maintenance occurring once per year where dredging would take place at the TMJ site.

BUNKER VESSEL SCENARIO

For the BVS, TJLP updated the LNG vessel emission rates of air quality measurable parameters based on the increased bunker vessel traffic, fewer LNG carriers, and updated bunker vessel information available at the time of the BVSA. The BVSA focused on changes to emissions of the following criteria air contaminants: NO_2, SO_2, $PM_{2.5}$ and PM_{10}. To assess potential effects of the BVS to air quality, the 1-hour, 24-hour and annual emissions scenarios assessed in the Application were reviewed to determine if the changes to bunker vessel traffic would affect these maximum emission scenarios. TJLP determined that the 1-hour and 24-hour air emissions scenarios assessed in the Application would still be appropriate and assessed a conservatively high level of air emissions since the types of LNG carriers (e.g., engine size and capacity) are not changing in the BVS. No changes are proposed for dredger operations; therefore, the Dredger Scenario remains unchanged from what was assessed in the Application.

TJLP undertook additional assessment of annual emissions to determine the effects to Air Quality due to annual increase in bunker vessel traffic for the Normal Operation Scenario. For Project Emissions, compared to the Application, TJLP determined the increase in bunker vessels

would decrease TMJ NO_X emissions by 19%, increase TMJ SO_2 emissions by 28%, and decrease TMJ $PM_{2.5}$ and PM_{10} emissions by 18%. For the Application Case, TJLP concluded that the Application Case annual NO_2 predictions have decreased by 10% from that predicted in the Application, due to the reduction in NO_X emissions realized with the updated bunker vessels (i.e., elimination of three tugs per bunker vessel and using the IMO Tier II NOX factor for the ATB). TJLP concluded that there are minor changes to the SO_2 (less than 1% decrease), $PM_{2.5}$ (4% decrease) and PM_{10} (4% decrease) predictions when compared to the Application, as the TMJ emissions do not have a measurable change on the maximum predictions because they are being driven by other regional background contributions.

Consistent with the Application, TJLP confirmed that the BVS is predicted to result in an increase in annual NO_2, SO_2, $PM_{2.5}$, PM_{10}, and that there were no changes to the characterization, and that the conclusions of the Application remain unchanged.

MARINE SHIPPING ASSESSMENT

In the MSA, potential effects were modeled using a screening-level air dispersion model to predict ambient concentrations as a result of TMJ at the closest shoreline receptor point to a TMJ-related vessel. The air quality modelling in the MSA considered two emission scenarios and predicted the following:

- Normal Operations Scenario (LNG powered carrier with a tethered diesel tug): One-hour SO_2, one-hour and eight-hour CO, and 24-hour $PM_{2.5}$ and PM_{10} would be less than one percent of the relevant air quality objective. The concentration of NO_2 is predicted to increase to 21.1 percent of the B.C. Ambient Air Quality[34];
- Abnormal Operations Scenario[35] (Diesel powered carrier with a tethered diesel tug): One-hour and eight-hour CO and 24-hour PM_{10} would be less than one percent of the relevant air quality objectives. One-hour SO_2 would be approximately 2.1 percent of the Metro Vancouver Ambient Air Quality Objectives. The concentration of NO_2 is predicted to increase to 22.7 percent of the B.C. Ambient Air Quality Objective; and
- Normal and Abnormal Scenario: 24-hour $PM_{2.5}$ would exceed the Metro Vancouver and B.C. Ambient Air Quality Objectives in both the Baseline and Application Cases as background concentrations are already higher than the air quality objectives. The

[34] Comparison against the Metro Vancouver Ambient Air Quality Objectives were used for SO_2, B.C. Ambient Air Quality Objectives for CO and both objectives for $PM_{2.5}$ and PM_{10} as the objectives are the same.

[35] TJLP expects that all LNG carriers and bunker vessels would be LNG powered; however, there could be occasions for diesel powered LNG carriers (a predicted maximum of 10 percent diesel fueled vessels, or 13 vessels per year).

predicted change from Baseline Case concentrations is around one percent of the air quality objective.

5.1.2.3 MITIGATION MEASURES PROPOSED IN THE APPLICATION

The Application proposed the following mitigation measures to avoid or minimize the potential adverse effects of TMJ on Air Quality:

- Project Design mitigations would reduce emissions through technology/ component selection, process design, fugitive emissions management, as well as cryogenic systems designed to avoid leaks (Project Design mitigations are already incorporated into TMJ emissions used in the assessment);
- LNG fueled vessels will comprise 90% of the vessels called to TMJ and that up to 10% may primarily be diesel fuel powered;
- It is TJLP's intention that LNG vessels and barges would meet MARPOL, 1973 as Modified by the Protocol of 1978, Annex VI, Tier III emission requirements for the priority elements, where applicable, to a specific vessel type;
- Mitigation measures designed to minimize potential adverse effects to Air Quality would be included in relevant management plans; and
- The Air Quality Management Plan would be put in place to manage air emissions and fugitive dust during facility construction, operations, and decommissioning.

No additional mitigation measures were proposed by TJLP as part of the MSA or BVSA.

5.1.3 POTENTIAL PROJECT EFFECTS AND PROPOSED MITIGATIONS IDENTIFIED DURING APPLICATION REVIEW

The following key issues related to the assessment of Air Quality for TMJ were identified during Application review and based on feedback from the Working Group:

- Assessment criteria;
- Assessment of construction emissions; and
- Assessment of annual air quality effects in the MSA;
- Use of shore power as mitigation measure; and
- Bunker Vessel Scenario Assessment.

ASSESSMENT CRITERIA

Tsleil-Waututh Nation, ECCC, HC, Metro Vancouver, Richmond and the BC OGC requested the constituents of potential concern for TMJ be compared to the 2025 Canadian Ambient Air Quality Standards (CAAQS) (coming into effect when TMJ is operational) which are the most stringent air quality objectives and that this comparison be considered when determining

significance of effects for both the original and MSAs. ECCC noted the following in making this request: CAAQS are applicable throughout Canada; CAAQS were developed in consideration of both human health and the environment; and the operations phase of TMJ would occur post-2025.

Particular concerns were expressed regarding the assessment of NO_2 effects due to TJLP's predictions of high magnitude effects for the one-hour average period. HC noted that NO_2 is a non-threshold contaminant (meaning health effects may occur at any level of exposure). Furthermore, Metro Vancouver and ECCC stated that Metro Vancouver has now adopted more stringent Ambient Air Quality Objectives for NO_2 which align with the federal 2020 CAAQS. The previous, less stringent Metro Vancouver Ambient Air Quality Objectives which were used in the Application are no longer applicable.

Metro Vancouver and ECCC disagreed with TJLP's view that the assessment is overly conservative and indicated that the most conservative method was not used to calculate the background concentrations and near-road environments were not considered. Tsleil-Waututh Nation stated that although the CAAQS are generally used for airshed management and not at a project-level, TMJ cannot be considered in isolation and these TMJ-related effects need to be considered when managing an airshed.

In response to the concerns raised, TJLP provided a supplemental memo[36] which included comparison of annual and one-hour NO_2 against the 2020 and 2025 CAAQS, consideration of this comparison in TJLP's significance determination of NO_2 effects and justification for why the CAAQS are not, in TJLP's view, an appropriate metric to evaluate TMJ effects. The memo included the following:

- Comparison of potential NO_2 concentrations to the CAAQS: The memo predicted exceedances for both the one-hour and annual NO_2 standards. Baseline Case one-hour NO_2 concentrations already exceed the CAAQS. The predicted change in the maximum one-hour concentration of NO_2 due to TMJ was 152 percent of the CAAQS. Both the Baseline Case and Application Case predicted 358 hourly exceedances per year, meaning there were no predicted increases in the number of exceedances from baseline due to TMJ;
- Use of CAAQs for TMJ EA: In TJLP's view, the CAAQS are not an appropriate metric to evaluate TMJ effects as they are designed to be used for airshed management, not for

[36] TJLP's NO_2 Supplemental Memo, dated September 16, 2019 (https://projects.eao.gov.bc.ca/api/public/document/60a49221148b4a00233060fa/download/20190916_ECCC_MV_OGC_TWN_AQ_NO2%20Assessment.pdf).

assessing maximum concentrations outside the TMJ area at a local scale (the LAA and RAA are not representative of an airshed). TJLP noted that the Canadian Council of Ministers of the Environment (CCME) stated CAAQS were not developed for assessing individual project-related effects at a local scale and that achievement of the CAAQS is to be compared against an airshed or air zone;

- Air quality conclusions: TJLP indicated that the conclusion that one-hour NO_2 emissions would not have a significant effect is appropriate even though there are exceedances of the most stringent air quality criteria because of the conservative nature of the short-term NO_2 assessment (air dispersion modelling used the largest LNG carrier, the longest LNG loading duration, diesel powered LNG carriers and maximum one-hour NO_2 emission rates) as well as the short duration of the air quality effects; and
- Mitigations: TJLP stated that comparison against the CAAQS would not facilitate additional mitigation measures as the majority of TMJ one-hour NO_2 emissions are from the tugs not under operational control of TJLP. Therefore, it would not be feasible to include more mitigations than those already presented in this assessment.

The EAO considered this information and found that comparison of NO_2 against the CAAQS would not change the EAO's overall assessment of TMJ effects on air quality. TMJ effects on one-hour NO_2 were one of the primary air quality concerns for the Working Group. These predictions were conservatively based on the largest diesel operated LNG carrier, with the longest LNG loading duration and the maximum one-hour NO_2 emission rates. In reality, most vessels would be LNG powered with varying engine sizes. Maximum emission rates were modelled as if continuous (that is, emission sources emitting at their maximum hour emission rates every hour of the year), when in reality, the maximum emissions would only occur when LNG vessels are berthing and departing (only 0.16 percent of the year) leading to a reduction in likelihood of one-hour NO_2 concentrations being as high as modeled in the Application.

One-hour and annual SO_2 were compared to the 2025 CAAQS in the Application and found that both the one-hour and annual predictions for the Normal Operations and Dredger Operations were below the CAAQS.

The EAO notes that comparison against the 2025 CAAQS was conducted in the assessment of human health for the original Application area and the MSA which incorporates risk and exposure to constituents of potential concern (Section 6.1 of this Report). The EAO is satisfied that this issue is adequately resolved for the purposes of the EA. The EAO is proposing Condition: 19: Air Quality Management Plan, which would include mitigation measures TJLP would implement to reduce adverse effects to air quality, require TJLP to estimate or measure air quality parameters attributable to TMJ, and include triggers that would cause TJLP to take corrective action to reduce those parameters. The EAO is also recommending a KMM under

CEAA 2012 for an Air Quality Management Plan, which would include how TJLP is participating in the identification and implementation of regional environmental management measures and cumulative effects monitoring to manage air quality, including relevant initiatives that might exist in the future that have a role for marine terminal operators. The EAO also recommends a non-LNG vessel limitation KMM under CEAA 2012, requiring that the number of LNG vessels, excluding LNG barges driven by tugs, calling on the jetty that use crude oil-based fuels (such as diesel) as their primary fuel shall not exceed 13 calls annually. This KMM captures TJLP's assumption used in the air quality analysis in the Application that up to 10% of the 137 vessel calls would be diesel-powered.

ASSESSMENT OF CONSTRUCTION EMISSIONS

ECCC, Metro Vancouver and Tsleil-Waututh Nation expressed concerns that TJLP did not assess emissions from construction and decommissioning and only qualitatively stated that they would not be the phases with the largest air quality effects, thereby making operations the "bounding" phase. These Working Group members felt that insufficient justification was provided in the Application to substantiate this claim and that minimal explanation was provided on how emissions from construction would be mitigated. Tsleil-Waututh Nation indicated that they would like to see further efforts to reduce emissions during construction. Metro Vancouver stated that, because $PM_{2.5}$ emissions would be the highest during construction, $PM_{2.5}$ either needs to be modeled to understand the effect on ambient air quality or monitored during construction. Additional information to justify limiting the assessment to TMJ's operations only and details on mitigation measures to limit the emissions during construction were requested.

> TJLP provided a supplemental memo[37] detailing the construction activities and quantified air emissions, including a comparison of construction emission rates against predicted Normal Operations and Dredger Operations Scenario emission rates. The memo from TJLP concluded that the maximum one-hour NO_x emission rates during construction would be slightly greater than Dredger Operations but less than Normal Operations. Maximum construction one-hour SO_2 and CO construction emission rates would be less than both the Normal and Dredger Operations scenarios. Maximum 24-hour $PM_{2.5}$ and PM_{10} emission rates during construction would be slightly greater than both the Project Normal and Dredger Operations scenarios. Maximum construction annual NO_x, CO, $PM_{2.5}$ and PM_{10} emission rates would be greater than the Normal

[37] TJLP's Construction Phase – Air Quality Supplemental Memorandum, dated December 9, 2019 (https://www.projects.eao.gov.bc.ca/api/public/document/60a4941b148b4a0023306116/download/20191209_MV_TWN_AQ%20Construction%20Assessment.pdf).

Operations scenario while annual SO_2 would be slightly lower. TJLP stated that construction activities associated with TMJ would be relatively small. TJLP noted that it is important to consider that construction emission rates are expected to be highly variable and intermittent over the three-year construction. Therefore, the comparison of the maximum short-term (one-hour and 24-hour) emission rates between construction and the Normal Operations Scenario is the most important. In the context of total regional emissions, the annual construction emissions would be less than 0.1 percent of the regional emissions and would likely be masked by any existing trucks on the road. TJLP also noted that the emission rates presented are maximum emission rates that assume all construction activities that can happen concurrently are active, which is a highly conservative approach. The supplemental memo also listed the construction mitigation measures which included industry standard mitigation measures such as air quality and fugitive dust management plans (which would include site-specific mitigation measures and recommendations for action in order of effectiveness) which were already incorporated into the emission rates. No additional mitigation measures were proposed.

The EAO is of the view that sufficient information on the TMJ construction activities and emission rates was provided by TJLP and that the issue discussed is adequately resolved for the purposes of the EA. Although emission rates of some air quality parameters during construction were predicted to be higher than operations during certain times, estimates of these rates were highly conservative as they assumed all construction activities would be happening concurrently, which is an unlikely scenario given the multi-staged approach inherent to the construction schedule. Construction activities for TMJ contribute little to the total regional emissions. In addition, TJLP have committed to implementing standard management practices for the control of fugitive dust at the TMJ site. The EAO is proposing Condition 19: Air Quality Management Plan, Condition 20: Greenhouse Gas Reduction Plan, and recommending KMM under CEAA 2012 for an Air Quality Management Plan.

ASSESSMENT OF ANNUAL AIR QUALITY EFFECTS IN THE MARINE SHIPPING ASSESSMENT

HC and Fraser Health expressed concern that TJLP did not consider annual air quality effects in the MSA; only one-hour and 24-hour averaging periods were assessed. HC stated that while emissions from the vessels associated with TMJ may be intermittent, exposure to air contaminants is expected on a regular basis for a number of years, which makes considering the chronic health effects of this exposure appropriate. HC found TJLP's rationale for not including the annual air quality assessment insufficient and this remains an area of uncertainty in the MSA.

In response to this concern, TJLP indicated that annual air quality effects were not

considered in this assessment because the TMJ-related shipping traffic compared to the existing marine traffic is minimal. TMJ-related shipping would result in 236 vessel movements per year (less than one per day) in the MSA. The number of all TMJ-related vessel movements ranges from 0.2 percent to 1.1 percent over the shipping corridor in the Marine Shipping Assessment Area (MSAA).

The EAO is satisfied with TJLP's response to HC's request and conclude that an annual assessment of effects to air quality is not necessary. This is due to the prediction that TMJ-related shipping traffic compared to existing marine traffic would be minimal and the EAO is therefore of the view that TMJ would have a negligible effect on annual air quality effects.

USE OF SHORE POWER AS MITIGATION MEASURE

ECCC and Metro Vancouver requested that TMJ-related vessels calling to TMJ be required to connect to shore power as a mitigation to reduce GHGs and air quality effects while the vessels are at berth, and Delta expressed interest in a provincial condition requiring TJLP to investigate the feasibility of providing shore power to LNG carriers and bunkering vessels.

In response, TJLP stated that connecting an LNG carrier to shore power has to be reviewed against all applicable codes, standards and detailed risk assessments for the facility. TJLP noted that the design, certification and approval is not yet available for the shore power of LNG carriers and may not be compatible with emergency un-berthing requirements. Although there are a few early adaptors, the BC OGC, as a regulator, would need to be consulted and may not be receptive to the introduction of a new, unproven practice which is not widely used in other jurisdictions. In a meeting with the EAO on November 6, 2020, TJLP explained that shore power would not mitigate the main source of one-hour NO_2 emissions as the peak emissions are heavily influenced by the tugs during berthing and would only minimally mitigate annual NO_2 emissions. TJLP stated that they could report on NO_2, $PM_{2.5}$ and GHG emissions related to operations and include a plan to ensure that these emissions were not above levels in the Application.

The EAO is satisfied with TJLP's response and concludes that the use of shore power should not be required for TMJ.

BUNKER VESSEL SCENARIO ASSESSMENT

During the BVS review, Metro Vancouver noted that the assessment relied on a background value for annual NO_2 (2012-2016), which is no longer representative of current air quality in the study areas. Metro Vancouver noted that NO_2 levels have steadily improved in the study area over the years, the outdated data is no longer relevant to the current or future air quality in the study areas, and the background is not appropriate for the BVSA. Using more recent (2019-

2021) data, Metro Vancouver stated that the predicted maximum annual concentrations for the Baseline Case do not exceed the 2025 annual NO_2 CAAQS, while the Application Case does. Metro Vancouver submits that this results in a "high" magnitude rating for annual NO_2.

> TJLP responded that the assessment approach used the same methods and existing conditions as the Application to allow for comparison between the Application scenario and BVS. On an annual basis, TJLP concluded that the BVS resulted in slightly lower offsite annual NO_2 concentrations compared to the Application. As such, TJLP stated that the magnitude assignment of annual NO_2 in the BVSA is in line with that assigned in the Application. TJLP noted that the background annual NO_2 concentrations used in both the Application and BVSA are conservative (i.e., higher), which adds to the conservatism of the Application and BVSA.

The EAO acknowledges that the NO_2 levels in the region have improved and the background values for annual NO_2 have changed since the Application was submitted in 2019. Given that the BVSA was conducted to understand how the predicted residual effects changed from the Application scenario to the BVS, the EAO supports the comparison using the same data. The EAO concludes that use of more current background NO_2 values would not result in any additional provincial conditions or recommended KMMs under CEAA 2012.

5.1.4 THE EAO'S ANALYSIS AND CONCLUSIONS

The EAO evaluated the potential effects to air quality by considering construction, operations and Decommissioning activities that could affect air quality due to the increase in combustion exhaust from LNG carriers and bunker vessels while berthing, loading and departing; associated vessels such as tugs and security vessels, as well as fugitive emissions from the pipeline system. These effects may result in residual adverse effects from increased one-hour and annual NO_2 and CO emissions as well as increased 24-hour $PM_{2.5}$ and PM_{10}. One-hour and annual SO_2 emissions as well as annual $PM_{2.5}$ and PM_{10} have a negligible effect on Air Quality and were therefore not carried forward to significance determination.

Proposed Provincial Conditions and Key Mitigation Measures (CEAA 2012)

Based on mitigations proposed in the Application and issues raised during Application review, the EAO proposes the following provincial conditions and recommends KMMs under CEAA 2012:

- Conditions 10: Construction Environmental Management Plans (provincial condition);
- Condition 11: Operations Environmental Management Plans (provincial condition);

- Condition 19: Air Quality Management Plan (provincial condition) and Air Quality Management Plan (KMM) with best management practices to mitigate effects to air quality; and
- Non-LNG-Fueled vessel limitation KMM

Residual Effects: After considering the proposed mitigation measures, the EAO concludes that TMJ would result in the following residual adverse effects to Air Quality during operations for the Application scenario and BVS (MSA residual effects are considered separately below as they cannot be readily combined with predictions from the jetty to Sand Heads):

- One-hour and annual NO_2;
- One-hour and annual CO; and
- 24-hour $PM_{2.5}$ and PM_{10}.

The EAO's characterization of the predicted residual effects of TMJ on Air Quality is summarized below and reflects the EAO's level of confidence in the effects determination (including their likelihood and confidence).

Table 8: Summary of residual effects for Air Quality (Jetty to Sand Heads)

Criteria	Assessment Rating	Rationale
Context	Low to Moderate Sensitivity	Predicted maximum Baseline Case data indicated that air quality in the region is well below Metro Vancouver's Ambient Air Quality Objectives, with the exception of 24-hour $PM_{2.5}$ (which is at 89 percent of the Ambient Air Quality Objective) indicating that sensitivity to TMJ effects are considered Low to Moderate. Additionally, effects from TMJ are not expected to occur off-site where humans are present, with the exception of one-hour NO_2. Human activity is possible at one of the single discrete receptors in the Normal Operations Scenario, but no residences, schools or hospitals are at this location.
Magnitude	**Annual NO_2**: Low **One-hour NO_2**: High **CO**: Low to Moderate **24-hour $PM_{2.5}$**: Moderate **24-hour PM_{10}**: Moderate	The magnitude of the annual averaging period for NO_2 is considered low as concentrations would remain below the air quality objective with an increase to two percent of the air quality objective. The magnitude of residual effects for the one-hour averaging period of NO_2 concentration is assessed as high as TMJ emissions have the potential to increase the concentration to up to 164 percent of the Metro Vancouver air quality objective. These magnitude ratings apply to the Application scenario and BVS. For the Application, scenario the magnitude of CO concentrations is low for both the one-hour and annual averaging periods as the increase due to TMJ from the Baseline Case is two percent and three percent, respectively. For the BVS, the one-hour remains the same as the Application, and for annual averaging periods TMJ is predicted to contribute approximately 11% respectively of existing marine emissions along the South Fraser resulting in a moderate magnitude.

Criteria	Assessment Rating	Rationale
		The 24-hour $PM_{2.5}$ and PM_{10} residual effects are classified as moderate as the contribution from TMJ sources would be 26 percent and 14 percent of the Metro Vancouver Ambient Air Quality Objectives, respectively bringing the 24-hour $PM_{2.5}$ predicted Application Case concentrations to 97 percent of the Metro Vancouver Ambient Air Quality Objective and 24-hour PM_{10} Predicted Application Case concentrations to 59% of the Metro Vancouver Ambient Air Quality Objective. These magnitude ratings apply to the Application scenario and BVS. During construction, the magnitude for NO_2, CO and 24-hour $PM_{2.5}$ and PM_{10} would be the same as during operations as the emission rates between the two phases are similar.
Extent	Local	Effects on Air Quality from TMJ are expected to be localized in the LAA as maximum concentrations and any exceedances of the relevant air quality objectives occur within the LAA for both construction and operations.
Duration	**Normal Operations:** Long-term **Dredger Operations:** Long-term **Construction:** Medium-term	The duration of the effect of TMJ on Air Quality during the Normal Operations scenario is classified as long-term as effects would persist throughout the entire life of TMJ but are not expected to surpass that. The duration of the effect of TMJ on Air Quality during the Dredger Operations scenario is classified as long-term as effects would persist for up to two weeks per year during maintenance dredging for the life of the TMJ. The duration of the effect of TMJ on Air Quality during construction is classified as medium-term as effects would persist for just over 3 years.
Reversibility	Reversible	Residual effects on air quality for both construction and operations would cease following decommissioning. Note that any consequent health effects may not be reversible.
Frequency	**Normal Operations:** Frequent **Dredger Operations:** Infrequent **Construction:** Frequent	For the Application scenario and BVS, the greatest emission sources, such as LNG bunker vessels and carriers, during the Normal Operations scenario are not continuous but would be present frequently in the LAA. Residual effects are predicted to be frequent, however, the frequency of one-hour NO_2 exceedances would be infrequent as exceedances of one-hour NO_2 are predicted to occur for a maximum of 6 hours per year for the Application scenario and BVS. Dredging would only occur once per year for a duration of up to two weeks during operations. Effects of TMJ on Air Quality during construction is classified as frequent as effects from construction would occur regularly over around a 3-year period.
Likelihood	There is a high likelihood of effects to air quality during construction, Normal Operations and Dredging Operations scenarios.	
Confidence	The EAO has a high level of confidence that, based on the conservative nature of the NO_2, SO_2, CO, PM_{10} and $PM_{2.5}$ emission estimates, TMJ actual effects would be lower than predicted. The one-hour predictions were based on emissions from the largest diesel operated LNG carrier, with the longest LNG loading duration and the maximum one-hour NO_2 emission rates. In reality, most vessels would be LNG powered with varying engine sizes. Maximum emission rates	

Criteria	Assessment Rating	Rationale
	were modelled as if continuous (that is, emission sources emitting at their maximum hour emission rates every hour of the year), when in reality, the maximum emissions would only occur when LNG carriers are berthing and departing (up to 0.16 percent of the year in the Application scenario, and less frequent considering the BVS) leading to a reduction in likelihood of one-hour NO_2 concentrations being as high as modeled in the Application and BVS.	
Significance	In consideration of the above analysis and the conditions identified in the Table of Conditions (TOC) (which would become legally binding if an EAC is issued) and recommended KMMs under CEAA 2012 (Appendix 1), as well as the conservative nature of the modelling of effects, the EAO concludes that TMJ would not have significant adverse residual effects on the Air Quality VC from the jetty to Sand Heads.	

MARINE SHIPPING ASSESSMENT

After considering the proposed mitigation measures, the EAO concludes that the TMJ would result in residual adverse effects to Air Quality due to an increase in the following air quality concentrations during operations: One-hour NO_2, one-hour SO_2, one-hour and eight-hour CO, and 24-hour $PM_{2.5}$ and PM_{10}.

The EAO's characterization of the predicted residual effects of TMJ on Air Quality in the MSA is summarized below and reflects the EAO's level of confidence in the effects determination (including their likelihood and confidence).

Table 9: MSA Summary of residual effects for Air Quality

Criteria	Assessment Rating	Rationale
Context	Low to High sensitivity	Predicted maximum Baseline Case data indicated that air quality in the region is well below the Ambient Air Quality Objectives, with the exception of 24-hour $PM_{2.5}$ (which is at 127 percent of the Ambient Air Quality Objective due to the B.C. forest fires in 2018) indicating that sensitivity to TMJ effects are considered Low to High.
Magnitude	Negligible - Moderate	**Normal Operations Scenario (considered LNG powered carriers with a tethered diesel tug):** Residual effects of one-hour NO_2 are assessed as moderate as the percent of change of the B.C. Ambient Air Quality objective due to TMJ is 21 percent (remaining below the B.C. Ambient Air Quality Objective). All other constituents were assessed as negligible as the percent of change of the objective is 0.4 percent or less. **Abnormal Operations Scenario (considered diesel powered carriers with a tethered diesel tug):** Residual effects of one-hour NO_2 are assessed as moderate as the contribution from TMJ sources would be 23 percent of the air quality objective. One-hour SO_2 and 24-hour $PM_{2.5}$ are assessed as low as the contribution from TMJ sources would be 2.2 percent and 1.2 percent respectively of the air quality objective. All other constituents are assessed as negligible as the contribution from TMJ sources are 0.7 percent or lower of the air quality objective.

Criteria	Assessment Rating	Rationale
Extent	Local	Predicted concentrations for Air Quality were assessed at the closest receptor locations (shoreline) to the shipping corridor (or vessel location) geographically set in the MLAA. Predicted concentrations at other receptor locations are expected to be lower as they are a greater distance from the shipping corridor.
Duration	Long-term	The duration of the effect of TMJ on Air Quality for the MSA is classified as long-term as effects would persist throughout the entire lifespan of TMJ but are not predicted to surpass that.
Reversibility	Reversible	Residual effects on Air Quality would cease following the decommissioning of TMJ. Note that any consequent health effects may not be reversible (Please see the Human Health in Section 6.1 of this Report).
Frequency	**Normal Operation:** Frequent **Abnormal Operation:** Infrequent	The Normal Operations Scenario's effects are defined as frequent as effects from the vessels on Air Quality would occur intermittently (approximately once every three days) over the life-span of TMJ. The Abnormal Operations Scenario's effects are defined as infrequent as diesel powered LNG carrier vessel calls would be infrequent (maximum of approximately 13 vessels per year).
Likelihood	There is a high likelihood of air quality effects during the Normal Operations and Abnormal Operations scenarios.	
Confidence	The EAO has a high level of confidence that effects have not been underestimated based on the conservativism of the emission inventory, the screening level dispersion modelling approach, and the conservative approach to establishing baseline conditions. Based on this conservativism in the assessment, the EAO finds it likely that air quality effects would be lower than modeled.	
Significance	In consideration of the conditions identified in the TOC and other KMMs, as well as the conservative nature of the modelling of effects, the EAO concludes that TMJ MSA would not have significant adverse residual effects on the Air Quality VC.	

5.1.5 CUMULATIVE EFFECTS ASSESSMENT

There are four existing and reasonably foreseeable future projects and activities that have the potential to interact cumulatively with TMJ's residual effects on Air Quality in the original Application area (that is, jetty to Sand Heads).

Past, present and reasonably foreseeable future projects and activities that were considered in the cumulative effects assessment for the Air Quality VC include:

- Vancouver Airport Fuel Facilities Corporations Fuel Delivery Project (VAFFC);
- Seaspan Ferries Tilbury Terminal Expansion;
- Tilbury Phase 2 LNG Expansion Project (this project was not included in TJLP's Application for the original Application area, but was requested by Working Group members that the EAO consider it in the cumulative effects assessment);

- Delta Grinding Facility (this project was not included in TJLP's Application for the original Application area, but was requested by Working Group members that the EAO consider it in the cumulative effects assessment); and
- RBT2 (TJLP determined this project would not have any potential interaction with TMJ due to approximate distance from TMJ. The Working Group requested that the EAO consider it in the cumulative effects assessment).

The emissions of the VAFFC and the Seaspan Ferries Tilbury Terminal Expansion are similar to those of TMJ. Construction on these two projects are expected to be completed before the start of TMJ, therefore, interactions during operations were the focus of the cumulative effects assessment. For the Application scenario and BVS, the maximum predicted change in concentration of one-hour NO_2 due to the addition of TMJ sources at the location of these future projects is 22 percent of the Metro Vancouver Ambient Air Quality Objective, 3 percent for 24-hour $PM_{2.5}$, and 2 percent for annual NO_2 and 24-hour PM_{10}. For one-hour and eight-hour CO, the maximum predicted change is less than 1 percent for the Application scenario and BVS. The extent of the residual effects at the reasonably foreseeable future projects for all measurable parameters and averaging periods was determined to be within the LAA, similar to TMJ based on the similarity in emission sources. The mitigation measures to assist in minimizing the cumulative effects of the projects would be the same as those described above in Section 5.1.2.3. The residual cumulative effects for the Application scenario and BVS are assessed as long-term, and frequent. The magnitude for one-and-eight-hour CO would be negligible as less than a 1 percent change compared to the relevant Ambient Air Quality Objective due to the projects for the Application and BVS scenario. Annual NO_2 and 24-hour $PM_{2.5}$ and PM_{10} would be affected at a low magnitude at 2-3 percent of the relevant Ambient Air Quality Objective for the Application and BVS scenario. One-hour NO_2 would be affected at a moderate magnitude at 22 percent of the relevant Ambient Air Quality Objective for the Application and BVS scenario. No additional mitigation measures have been proposed.

Emissions from the Delta Grinding Facility which could affect air quality in the region include road and marine traffic, the use of mobile equipment and process equipment on site as well as routine dredging activities. Potential pollutants expected to be generated during these activities include NO_x, SO_2, CO, $PM_{2.5}$, PM_{10}, Diesel Particulate Matter (DPM) and Volatile Organic Compounds (VOCs). The Delta Grinding Facility's March 2019 project description estimates 10-14 marine vessel movements per year. The EAO is not yet aware of the predicted air quality effects associated with these vessel movements, but there is the potential for TMJ to act cumulatively with these activities. The Delta Grinding Facility is currently in the provincial EA process and TMJ effects could be considered in the cumulative effects assessment for that project, should residual effects be predicted for Delta Grinding.

Emissions from the RBT2 which could affect air quality in the region include air emissions from fuel combustion in diesel, propane and gasoline powered equipment and activities, as well as marine shipping. Potential pollutants expected to be generated during these activities include NO_x, SO_2, CO, $PM_{2.5}$ and PM_{10}. The federal panel concluded that construction and operations of RBT2 would result in exceedances of the applicable air quality standards and guidelines for NO_2 and $PM_{2.5}$. The federal panel concluded that ambient air pollution conditions in the marine shipping area are unlikely to be materially affected by project associated marine shipping as it would emit a very small fraction of total pollutants in the marine shipping area. RBT2 is anticipated to be operational by 2025 and overlaps geographically with both the TMJ air quality RAA and the MRAA indicating a potential cumulative effect within the airshed.

As indicated in FortisBC's Initial Project Description for the Tilbury Phase 2 LNG Expansion Project, emissions from the Tilbury Phase 2 LNG Expansion Project which could affect air quality in the region include operations of the electric drive compression liquefaction facility, gas-and diesel-powered operational vehicles and equipment, thermal oxidizers, gas flare and fired heaters. Other sources of air emissions may include transportation, TMJ site maintenance and equipment operations. Potential pollutants expected to be generated during these activities include NO, CO_2, SO_2, hydrocarbons and PM. The EAO is not yet aware of the predicted air quality effects associated with these activities, but there is the potential for TMJ to act cumulatively. The Tilbury Phase 2 LNG Expansion Project is currently in the EAO EA process and TMJ effects could be considered in the cumulative effects assessment for that project, should residual effects be predicted for Tilbury Phase 2 LNG Expansion Project. The effects of the FortisBC Tilbury LNG Facility Expansion Project (Phase 1) on emissions were considered in the assessment of baseline emissions and were therefore already assessed under residual effects.

The Fraser Surrey Docks Direct Transfer Coal Facility, Pattullo Bridge Replacement (PBRP), Fraser River Tunnel Project, VFPA Habitat Enhancement Program, TMX and Delta Link Business Park projects were all considered in the cumulative effects assessment but were determined to not have any potential interaction with TMJ due to either the distance to TMJ or low contribution of air quality parameters.

MARINE SHIPPING ASSESSMENT

Reasonably foreseeable future projects and activities which have a vessel transit component along the marine shipping corridor were identified as having the potential to act cumulatively with MSA Air Quality residual effects. Consideration in the MSA Application was given specifically to the cumulative effects assessment undertaken for RBT2 and TMX MSAs.

The air quality parameters that were considered in the cumulative effects assessment include one-hour NO_2 under the Normal Operations (LNG powered carrier and tethered tug), and NO_2, SO_2 and $PM_{2.5}$ under the Abnormal Operations Scenario (diesel powered carrier and tethered

tug). The MSA Application predicted the total projected increase in vessel traffic from 2017 to 2030. As a percentage of future total vessel movements in 2030, the number of all TMJ-related vessel movements ranges from 0.4 percent to 1.7 percent over the shipping corridor.

To further consider the potential cumulative effects, the MSA Application included the cumulative effects assessment undertaken for the TMX. The TMX is expected to add 710 diesel powered tanker vessel movements plus 710 tug vessel movements annually. The TMX MSA concluded that the cumulative effects from marine vessel traffic is of low magnitude, long-term duration, periodic frequency and short-term reversibility. The overall significance determination for cumulative effects to the Air Quality VC was not significant. The RBT2 project is expected to add 520 diesel powered container vessel movements annually. RBT2 considered the potential cumulative effects on air quality, but air quality was included as an intermediate component, not a VC, so an overall significance determination of cumulative effects was not defined.

The EAO concludes that TMJ would not have significant adverse residual cumulative effects on the Air Quality VC for both the original Application area and MSA area.

5.1.6 CONCLUSIONS

Considering the above analysis, and having regard to the mitigation measures identified in the provincial TOC including Condition 10: Construction Environmental Management Plan, Condition 11: Operations Environmental Management Plan, Condition 19: Air Quality Management Plan (which could become legally binding as conditions of the provincial EAC) and recommended KMM under CEAA 2012 for an Air Quality Management Plan (Appendix 1), the EAO is satisfied that TMJ would not have significant adverse residual or cumulative effects on the Air Quality VC.

5.2 GREENHOUSE GAS MANAGEMENT

5.2.1 BACKGROUND

Greenhouse Gas Management was selected as a sub-component of the Air Quality VC due to its importance to Indigenous Groups, the public, other stakeholders and its regulatory importance.

5.2.1.1 REGULATORY CONTEXT

The Government of Canada has set a target of reducing Canada's total GHG emissions by 40 to 45 percent from 2005 levels by 2030. At present, ECCC requires that any facility emitting more than 10 kilotonnes (kt) of carbon dioxide equivalents (CO_2e) report their annual GHG emissions online. In the fall of 2019, the Government of Canada announced further commitments to

strengthen existing measures and introduce new actions to exceed Canada's 2030 emission reduction target and to develop a plan to set Canada on a path to achieve a net-zero emissions future by 2050.

In 2019, the provincial government passed the *Climate Change Accountability Act*, (updating the *Greenhouse Gas Reduction Targets Act*) requiring the province to achieve GHG emission reductions of 40, 60, and 80 percent below 2007 emission levels by 2030, 2040 and 2050, respectively. The provincial government has also committed to legislating a province-wide net-zero emission reduction target for 2050. Achieving these targets will require emission reductions from all sectors of the economy. In October 2021, the provincial developed the CleanBC Roadmap to 2030 that outlined the path to achieve the 2030 target and put us on the path to achieve future emission reduction targets. As new emission sources come online, climate policy will need to become incrementally more stringent to lower Provincial emissions by the amount added by a project. At the current time, there are no project-level emission reduction requirements and level of emissions alone is not being used to determine the acceptability of a project. For this reason, the Roadmap also contained a commitment to require new industrial facilities to develop a plan to achieve net-zero emissions by 2050 and to consider the project's implications for the 2030 and 2040 targets. In the Province's Greenhouse Gas Emissions Inventory Report (the 2019 inventory), B.C.'s 2019 net CO_2e emission levels were reported at 68.6 million tonnes of carbon dioxide equivalent (CO_2e), 4.5 percent above 2007 levels (65.7 Mt CO_2e). To achieve the legislated GHG reduction goals, B.C. has designed and implemented a suite of policy, regulatory, and legislative measures to reduce emissions across the province. Using the public information in the 2019 inventory, the specific emission levels would be 39.42 Megatonnes (Mt) in 2030 (40% reduction), 27.44 Mt in 2040 (60% reduction) and 13.72 Mt in 2050 (80% reduction). At the current time, a net-zero plan is not yet required of new facilities and the level of a project's emissions alone is not being used to determine the acceptability of a project.

CEAA 2012 Sections 5(1)(b)(i)(iii) pertain to the assessment of changes in the environment on federal lands, in a province outside that of a project, or outside of Canada. This includes potential TMJ-related contributions to GHGs which are global in nature and have the potential for effects beyond the TMJ boundaries. In addition, an assessment of upstream GHGs is required under Canada's Interim Approach that was announced on January 27, 2016 and is consistent with objectives of Canada's Strategic Assessment of Climate Change initiative. ECCC informed the EAO that an upstream GHG assessment provides important information on how a project will influence upstream emissions from all stages of production from the point of resource extraction to the project under review. Unlike direct GHG emissions, upstream GHG emissions are outside the project scope and, therefore, are included neither in the federal determination of significant adverse environmental effects nor in the EAO's characterization of

effects and determination of significance of effects on GHG emissions. However, the assessment of upstream GHG emissions is required as it helps to inform the federal decision-making process. The EAO acknowledges Metro Vancouver's view that upstream GHG emissions should be included in the EAO's characterization of effects and determination of significance to conduct a complete assessment of the GHG impacts of TMJ.

MARINE SHIPPING ASSESSMENT

GHG Management is included as a VC for the MSA because vessel movements between Sand Heads to the 12 nm limit would result in GHG emissions from LNG carriers, bunker vessels and tug boats during transit.

5.2.1.2 BOUNDARIES

GHG management spatial boundaries are not defined as GHG and climate change are, by nature, both regional and global. Boundaries for GHG management correlate with the provincial and federal GHG policy, regulations and legislation.

5.2.2 POTENTIAL PROJECT EFFECTS AND PROPOSED MITIGATIONS IN THE APPLICATION

5.2.2.1 BASELINE INFORMATION AND POTENTIAL PROJECT EFFECTS

TJLP considers that TMJ would help lower provincial, national and global GHG emissions by supporting the transition from higher carbon intensity fuels used in marine shipping or for power generation to lower carbon intensity. Without the LNG bunkering infrastructure proposed by TMJ, TJLP expect regional and global shipping would continue to burn marine grade oil and diesel fuels. TJLP stated that ship to ship LNG fueling, enabled by TMJ, would enable local marine users to convert to LNG fuel through 'onboard' refueling from LNG truck tankers to ship would reduce GHG and other air quality pollutants. TJLP concluded that TMJ aligns with B.C. and Canada GHG reduction targets.

TMJ has the potential to emit GHGs throughout all phases of TMJ. Only the GHG emissions that occur during operations were considered, as annual GHG emissions are expected to be largest during this phase. In the Application, TJLP calculated that during operations, approximately 15.25 kt of CO_2e would be released annually (Table 10). This included direct emissions from fugitive losses, dredging vessel combustion, pump and thruster emissions and security vessel combustion emissions and indirect emissions from purchased electricity, marine vessel traffic within the TMJ boundary, marine vessel traffic between TMJ and Sand Heads, and domestic marine vessels from the MSA. In the Application, TJLP reported this would increase B.C.'s

emissions total by 0.02 percent and Canada's emissions total by 0.002 percent over 2017 levels[38].

Table 10: Comparison of GHG emissions during TMJ Operations to baseline conditions (Application scenario)

Source	Annual GHG Emissions (kt CO_2e/yr)	Project Total as a Relative Percentage (%)
Direct Emissions		**N/A**
Fugitive losses	4.16	
Dredging	1.03	
Security vessels	0.03	
Indirect Emissions		
Purchased electricity	0.06	
LNG carrier (within project boundary)	0.19	
LNG bunker vessel (within project boundary)	0.02	
Tugs	0.66	
Supply chain marine vessel combustion (between TMJ site and Sand Heads)	6.56	
Marine Shipping Assessment		
Domestic Marine Vessels	2.54	
International Marine Vessels	14.03	
Project Total with Domestic Marine Vessels	**15.25**	
Project Total with International Marine Vessels	**29.28**	
British Columbia (2017)	62,100	0.02
Transportation – domestic navigation (Canada)	4,380	0.3
Fugitive sources – natural gas (Canada)	13,000	0.1
Canada (2017)	716,000	0.002

BUNKER VESSEL SCENARIO

For the BVS, TJLP updated annual TMJ emission rates based on the increased bunker vessel calls per year and updated bunker vessel information. Consistent with the Application, TMJ has the potential to emit CO_2, methane (CH_4) and nitrous oxide (N_2O), which were recalculated for the BVS. For the BVS, TJLP calculated that 17.91 kt of CO_2e would be released annually during operations. The GHG emissions sources considered for the BVS are consistent with those in the Application for direct and indirect emissions described above. As in the Application, operations is expected to be the bounding phase (e.g., phases resulting in the highest GHG emissions) for the BVS; therefore, construction and decommissioning emissions were not assessed.

[38] In the Application, TJLP used the provincial Greenhouse Gas Emissions Inventory Report (2017) that was the most up to date at the time. In Section 5.2.4 of this Report (Table 11), the EAO also compared the increase in B.C.'s emissions from TMJ to the 2019 levels based on the provincial Greenhouse Gas Emissions Inventory Report (2019), and concluded they were 0.02 percent over 2019 levels.

The estimated direct and indirect GHGs for operations were estimated for the two bounding operation conditions for the BVSA: 1) 307 LNG Powered Bunker Vessels with a capacity of 7,600 m^3 and 2) 307 diesel powered ATBs with a capacity of 4,000 m^3. The GHG emissions from the 307 LNG Powered Bunker Vessels with a capacity of 7,600 m^3 results in the higher annual GHG emissions for the increase in bunker vessel traffic at TMJ. In comparison with the Application, the change in bunker vessel traffic increased the anticipated TMJ-related GHG emissions by approximately 20% (see Table 19 in Appendix B of TJLP's BVSA Report). TJLP explained that the higher GHG emissions are largely due to increased LNG bunker vessel traffic between the TMJ site and Sand Heads (i.e., supply chain emissions), as well as a minor increase in LNG bunker vessel GHG emissions during activities at the TMJ site (i.e., berthing, loading, departing).

TJLP considered the proposed GHG emission mitigation measures for TMJ as part of proposed federal and provincial conditions for TMJ and did not propose additional mitigation measures for GHG management as part of the BVSA. TJLP concluded, considering the BVSA, that all residual effect characterization parameters remain unchanged from those determined in the Application. In the BVSA Report, TJLP reported that the BVS would increase B.C.'s emissions total by 0.02 percent and Canada's emissions total by 0.002 percent over 2017 levels[39].

MARINE SHIPPING ASSESSMENT

The MSA determined that during operations the amount of emissions from TMJ-related vessels traveling along the marine shipping corridor would be 16.57 kt of CO_2e/yr. This included indirect emissions from both domestic marine vessels and international marine vessels. The marine shipping emissions would increase both B.C. and Canada's emissions totals by <0.01 percent.

UPSTREAM GHG ASSESSMENT

The upstream GHG emissions information is not included in the EAO's characterization of effects or considered in the determination of significance of TMJ effects on GHG emissions because upstream GHG emissions are outside the scope of the TMJ and are considered only for context. TJLP's upstream GHG assessment analysis concluded that upstream annual GHG emissions would range from 1,750 – 2,164 kt CO_2e in 2023 to 1,689 – 2,414 kt CO_2e in 2053. These values do not necessarily represent an increase in upstream production for export and

[39] In the BVSA Report, TJLP used the provincial Greenhouse Gas Emissions Inventory Report (2017) that was the most up to date at the time at the time of the Application, for comparison purposes. In Section 5.2.4 of this Report (Table 11), the EAO also compared the increase in B.C.'s emissions from TMJ to the 2019 levels based on the provincial Greenhouse Gas Emissions Inventory Report (2019), and concluded they were 0.02 percent over 2019 levels.

local/regional markets. The values include all emissions upstream of TMJ, including all extraction, pipeline transport and processing of natural gas into LNG.

As part of the upstream GHG assessment, ECCC required a discussion of how much of the upstream emissions would occur if TMJ was not built. The assessment includes Tilbury LNG Plant Phase 1 and 2. TJLP stated that, regardless of the development of TMJ, the same volume of gas would be extracted from the gas field and transported to the Tilbury LNG Plant for liquefaction. TJLP's No Project Case consisted of the current transportation methods of the Tilbury LNG Plant (i.e., mixture of truck transport for local and national end users, and ISO containers for sea transportation). The Project Case consisted of the shipment of all LNG to international and domestic markets using a mixture of barges and carriers.

5.2.2.2 MITIGATION MEASURES PROPOSED IN THE APPLICATION

TJLP proposed mitigation that focuses on avoidance and minimization of GHG emissions through project design, management plans and BMPs. KMM recommended included:

- Implementation of a leak detection and repair program for the LNG conveyance system;
- Ongoing routine maintenance of vehicles/ vessels, implementation of engine idling time restrictions, and reduced engine use where practical on vehicles/ vessels; and
- Technology and component selection, process design and managing fugitive emissions.

No additional mitigation measures were proposed by TJLP as part of the BVSA.

During the MSA review, TJLP acknowledged an additional mitigation measure:

- LNG carriers and bunkering vessels would have a mechanism to handle boil-off gas during vessel transit to prevent GHG emissions, through direct use or re-liquification into LNG during transit.

5.2.3 POTENTIAL PROJECT EFFECTS AND PROPOSED MITIGATIONS IDENTIFIED DURING APPLICATION REVIEW

The following key issues related to the assessment of GHG management for TMJ were identified during Application review and based on feedback from the Working Group:

- Fugitive emissions;
- No project case;
- Offsetting and GHG comparisons; and
- Shipping mitigation measures.

In addition to feedback received through the Working Group on key issues related to the assessment of GHG management, Indigenous Groups also provided feedback related to climate

change and impacts from upstream natural gas extraction activities. See Section 13.2.3 of Part C for more information on concerns raised by Indigenous Groups related to GHGs and climate change.

FUGITIVE EMISSIONS

The City of Richmond raised concerns about fugitive emissions from the boil-off line, venting for maintenance and repairs as well as boil-off from tank cooling on ships prior to loading and after loading not being accounted for in the emissions estimate. Kwantlen First Nation also requested that mitigations be put into place to prevent fugitive emissions of methane and ongoing monitoring for GHG emissions throughout the life of TMJ.

> TJLP responded that fugitive emissions from TMJ infrastructure which included the LNG supply pipeline, loading pipeline and return line have been estimated in the assessment. The boil-off line is a closed loop system with a return line back to the FortisBC Tilbury facility for processing. The FortisBC Tilbury LNG Plant was not the subject of this assessment. Prior to maintenance activities on the LNG supply or return line, the LNG within the lines would be evacuated back to the Fortis Facility using nitrogen. Any maintenance activities undertaken on the pipelines after the nitrogen evacuation is expected to result in minimal fugitive emissions.
>
> In terms of the shipping related boil-off, TJLP responded that the larger LNG export carriers that would visit TMJ would be LNG powered and would utilize boil-off gas within the engines. LNG carriers and bunkering vessels are not under the direct control of TJLP and were therefore considered within the indirect GHG emissions estimate. The vessel emissions were quantified using emission factors from ECCC's National Marine Emissions Inventory Tool, which provides one factor for each vessel type in a geographic region. The majority of all vessels visiting TMJ (90 percent) would be LNG powered.

The EAO is proposing Condition 19: Air Quality Management Plan and is recommending a KMM under CEAA 2012 for an Air Quality Management Plan, and Condition 20: Greenhouse Gas Reduction Plan. Plans include measures to reduce emissions including requirements for routine maintenance of vehicles/ vessels, implementing a designed leak detection, repair programs for TMJ's LNG conveyance system, and a mechanism to handle boil-off gas.

TC and ECCC requested that TJLP include fugitive methane emissions from LNG vessels in the MSA estimate of GHG emissions. ECCC recommended that TJLP calculate the total methane emissions resulting from fugitive releases from both the LNG carriers and the LNG bunkering vessels (including any loading or unloading of LNG from bunkers) in the marine shipping area out to the 12 nm limit and update the total marine shipping GHGs and total GHGs for TMJ.

In response, TJLP derived the emission factors for three different engine types[40] and the emissions factors included emissions from methane slip as well as combustion emissions. In comparison, the GHG emission factor (617 g CO_2e/kWh) used for LNG powered vessels within the MSA assessment was higher. The GHG calculations in the MSA for the LNG carrier are considered conservative.

The EAO is of the view that the issue discussed is adequately resolved for the purposes of the EAO. The EAO does not propose any related conditions specific to the issue identified.

NO PROJECT CASE

ECCC requested information demonstrating that the chosen No Project Case is a reasonable baseline case, including evidence that it would be economically feasible for the facility to produce and ship 2.6 M tonnes (75 percent of the 3.5 M tonnes throughput) by ISO container trucks and through an alternate port. ECCC also requested that TJLP provide examples of the relative costs and competitiveness of ISO container trade.

Tsleil-Waututh Nation and Metro Vancouver were of the view that TMJ and the proposed Tilbury Phase 2 Expansion project are interconnected, and that one project would not occur without the other. Tsleil-Waututh Nation stated that it is important for their own decision-making process to understand if the projects are inter-dependent and if TMJ is causing an increase in upstream GHGs. Tsleil-Waututh Nation does not accept the amount of uncertainty provided in TJLP's "No Project Case" and requested more information on whether the LNG plant would operate at full capacity if it were only shipping LNG using ISO containers. If not, then Tsleil-Waututh Nation would like to understand how TMJ is encouraging upstream production as a new source of demand as opposed to how it is currently being considered as an alternative way of transporting LNG. Metro Vancouver commented about the interdependencies between the two projects and that it was difficult to evaluate the GHG impact of TMJ without also considering the GHG impact of the Tilbury Phase 2 Expansion project. Metro Vancouver stated that when considering the additional impacts of upstream and downstream GHG emissions, it is Metro Vancouver's view that there would be significant adverse effects related to GHG emissions associated with TMJ.

TJLP confirmed that the existing facilities and Tilbury Phase 1 expansion (approved via provincial Order in Council) would produce LNG that would be shipped through TMJ,

[40] Emission factors were derived from Pavlenko, N., Comer, B., Zhou, Y., Clark, N., & Rutherford, D. (2020). The climate implications of using LNG as a marine fuel. International Council on Clean Transportation. January 2020. The CO_2e emission factors derived for the three engine types were 1) 565 g CO_2e/kWh, 2) 474 g CO_2e/kWh and 3) 400 g CO_2e/kWh.

and that TMJ does not require any of the Phase 2 expansion to proceed. The storage tank for Tilbury Phase 2 would proceed whether the TMJ is built or not, as the purpose of Phase 2 is to improve gas delivery system resiliency.

TJLP responded that, according to the Port of Vancouver, over 3,100 vessels call on Vancouver ports annually. Shipments are projected to increase to over 4,000 vessels in the next five years. The addition of 66 vessels carrying ISO containers would not be a significant addition to these numbers. The additional container traffic would represent only an eight percent increase in container volume handled by the port in 2018 and would not tax ports currently operating below capacity. Containers could be shipped from any port in the Vancouver area and may entail use of multiple ports.

FortisBC currently delivers an increasing amount of LNG to both marine bunkering and exporting customers through trailers and trailer mounted containers (ISO tanks). In 2020, TJLP noted that, to meet this growing demand, FortisBC has significantly expanded its truck loading capacity in the previous three years and planned to further expand its truck loading capacity in the following year. At that time, TJLP also noted that the ISO container export business had grown rapidly in the previous 12 months. FortisBC is developing opportunities with other customers interested in this specific mode of delivery as an alternative to bulk LNG delivery. TJLP provided additional information on market factors driving the growing demand for shipping LNG by ISO containers including the availability of customers, reliability, not requiring expensive LNG infrastructure, and price competitiveness.

TJLP noted that there is uncertainty related to the markets associated with the No Project Case ISO container markets. Similar uncertainty exists for all markets TJLP is pursuing for the marine jetty including the bunkering and bulk export markets. Due to the relatively small capacity of TMJ, TJLP is pursuing niche markets.

ECCC replied that their view is that the TJLP's base scenario is reasonable, although some uncertainty remains. FortisBC's agreement to supply 53,000 tonnes of LNG via ISO container to China is evidence that shipping LNG to Asia via ISO container can be economical, at least for some volumes. ECCC would have more confidence in the base scenario if more detailed cost and price evidence demonstrating that shipping ISO from Canada to Asia via ISO container would be economical for the 2.6 million tonnes included in the base scenario. Tsleil-Waututh Nation communicated to the EAO that this issue is not resolved, and Tsleil-Waututh Nation continues to be concerned with the interconnection between TMJ and increased LNG production related to Tilbury Phase 2 Expansion project, and associated questions on upstream GHG emissions. Tsleil-Waututh Nation noted the importance for Tsleil-Waututh Nation decision-making to have a full sense of GHG emissions (upstream, downstream and indirect).

Maa-nulth First Nations and Esquimalt First Nation considered that upstream GHG emissions should have been included in the EAO's conclusions on GHG management and that the no baseline case for upstream GHG emissions was unfounded given the uncertain economic viability of shipping that volume of LNG via truck and ISO container.

The EAO is of the view that the issue discussed is adequately resolved for the purposes of the EA. The EAO understands that the capacity of Tilbury Phase 2 would exist regardless of TMJ, and that TMJ is not FortisBC's only path to serve LNG customers. TJLP confirmed that TMJ does not require any of the Phase 2 expansion to proceed and that the storage tank for Tilbury Phase 2 would proceed whether the TMJ is built or not. The EAO concludes that TJLP has provided sufficient information about the relationship between TMJ and the Tilbury Phase 2 Expansion project, and although there is some uncertainty in the shipment of LNG via ISO container, TJLP has provided reasonable information about the economic viability of the alternative transportation of LNG. The EAO does not propose any related conditions specific to the issue identified.

OFFSETTING AND GHG COMPARISONS

Richmond, Metro Vancouver, Tsawwassen First Nation, Maa-nulth First Nations, Malahat Nation and Tsleil-Waututh Nation requested that TMJ offset its GHG emissions. During both Application and MSA review, Tsleil-Waututh Nation requested that GHG emissions be compared to municipal, provincial and federal climate targets, and requested more information on how TJLP intends to support the IMO targets of reducing GHG emissions.

> TJLP responded that the requirement to offset annual GHG emissions from TMJ is beyond the current regulatory requirements applicable to TMJ. Mitigation measures have been put in place to avoid and minimize GHG emissions as much as possible. There is currently no plan for offsetting GHG emissions for TMJ.

TJLP produced a technical memorandum[41] about comparing emissions to reduction targets and how it intends to support the IMO emission reduction targets. TJLP summarized the relevant municipal, provincial and federal emissions targets, and explained why the MSA did not compare TMJ emissions to these targets:

- The emission reduction targets apply to a specific geographic region as a whole, not an individual source or project within that region;

[41] TJLP response to TWN comments on the Marine Shipping Assessment Information Request dated January 15, 2020 (https://projects.eao.gov.bc.ca/api/public/document/60a5644e7429e10022397849/download/20200115_TWN%20MSA%20IR%20Supplemental.pdf).

- TMJ-related shipping between Sand Heads and the 12 nm limit does not take place within a municipal jurisdiction; therefore, a municipal target does not apply;
- GHG emissions associated with international navigation are not accounted for within provincial and federal inventory totals. Reduction targets use this inventory as a baseline; therefore, comparing emissions from international shipping to reduction targets that do not include marine shipping emissions in their baseline would be inconsistent; and
- The IMO sets out air emission limits and fuel restrictions for international shipping.

TJLP also noted in the memo that they would comply with any future regulations from IMO around GHG emissions.

TJLP highlighted goals in the 2018 CleanBC Plan that are aimed at reducing emissions while balancing economic growth in transportation corridors and promoting the use of clean fuel sources in transportation corridors and ports. The intention of B.C. to expand the BC Low Carbon Fuel Standard (LCFS) to apply to marine fuels, which TJLP noted could be instrumental in driving change in the marine transportation sector, was described in the CleanBC Roadmap. Specifically, the LCFS requires fuel suppliers to progressively decrease the average carbon intensity of the fuels they supply to users in B.C. New amendments to provincial *Low-Carbon Fuels Act* include provisions to incent demand for LNG as a marine fuel via the LCFS. TJLP understands that B.C. is now in the process of developing the associated regulations to fully enable this tool to incent the use of lower carbon fuels like LNG and bio LNG in B.C. It is TJLP's view that TMJ is aligned with this provincial policy direction as it provides critical infrastructure to enable the use of LNG as an alternative to conventional marine fuel. With a ready supply of lower-carbon LNG from B.C., TJLP stated that TMJ can support the decarbonization of the shipping industry.

TJLP has also outlined its conceptual approach to be net zero by 2050 for TMJ. TMJ would enable a local and regional net reduction in GHG and criteria air contaminant emissions by promoting transition from oil-based marine fuel to the cleaner LNG marine fuel, and it has relatively low direct and acquired emissions (<6 kt CO_2(e)/yr operating at full capacity). TJLP expects that detailed design incorporating energy efficiency and GHG reduction considerations, as well as operations and maintenance practices, would be the best opportunities to manage the direct GHG emissions associated with TMJ (of which most are fugitive emissions). TJLP notes that the TMJ facility concept is very efficient, relying on electrification of pumps and compressors, and incorporating modern fugitive emissions management and prevention techniques. While design has not been finalized, with the combination of modern design, operating techniques, and relatively low direct emissions, TJLP anticipates that offsetting approaches would be employed to manage residual GHG emissions and achieve net zero by 2050.

The provincial Climate Action Secretariat (CAS) informed the EAO that TMJ emissions were compared with current provincial emission totals to demonstrate the level to which they would contribute, upon beginning of operations, to Provincial emissions. As the Province moves towards its 2030, 2040 and 2050 targets, climate policies and programs will be implemented Province-wide to help B.C. achieve its targets. Some of these programs will likely affect the emissions related with TMJ. As a result of the incremental climate policy required to meet the targets that would affect TMJ's emissions, it is inappropriate to compare current projections of a facility's emissions with future emission target levels.

The EAO does not currently require GHG offsetting because the Province has legislated GHG reduction targets, a plan for GHG reductions (CleanBC), and a wide variety of regulatory tools to help achieve these targets. The EAO is of the view that the issues discussed are adequately resolved for the purposes of the EA and does not propose any related conditions specific to GHG offsetting. The EAO proposes Condition 20: Greenhouse Gas Reduction Plan, which includes mitigation measures to reduce GHGs during operations, require TJLP to estimate or measure GHG parameters attributable to TMJ, include triggers that would cause TJLP to take corrective action to reduce GHG parameters, and describe how TMJ would achieve any municipal, provincial, national or international government GHG regulations or objectives that are made mandatory for TMJ. The EAO is also proposing Condition 19: Air Quality Management Plan and recommending a KMM under CEAA 2012 for an Air Quality Management Plan.

SHIPPING MITIGATION MEASURES

Tsleil-Waututh Nation disagreed with TJLP's approach to excluding vessels visiting TMJ from the application of mitigation measures for GHGs. They noted that even if the vessels are not directly owned or operated by TJLP, vessel traffic must be included when assessing the effects of TMJ on the environment and required mitigation. During the MSA review, Metro Vancouver also requested that, at a minimum, mitigation measures should be identified to address all marine vessel emissions.

> TJLP responded that further mitigation measures are not feasible since TJLP does not directly own or operate the visiting vessels. The minimal mitigation measures present represent the extent to which TJLP can influence the behavior of users (LNG fueling) at their facility (that is, through management practices and contractual agreements). One of the mitigation measures noted in the Application was ensuring the majority of vessels calling at TMJ would utilize LNG as a fuel. TJLP made a commitment that 90 percent of visiting carriers would be LNG powered.

The EAO proposes Condition 19: Air Quality Management Plan which requires TJLP to include how the mitigation measures in Section 4.4.1.6.3 of the Application would be implemented including the mitigation measure ensuring that the majority of vessels calling at TMJ would use

LNG as a fuel. The EAO proposes Condition 20: Greenhouse Gas Reduction Plan which requires TJLP to include how mitigation measures in Section 4.4.2.4.3 of the Application would be implemented, including a process for TJLP to identify additional mitigation to minimize GHG emissions.

5.2.4 THE EAO'S ANALYSIS AND CONCLUSION ON EFFECTS TO GREENHOUSE GAS MANAGEMENT

This section presents the EAO's conclusions on the potential adverse residual effects from TMJ on GHGs.

Proposed Provincial Conditions and Key Mitigation Measures (CEAA 2012)

Based on the mitigation measures proposed in the Application and issues raised during Application review the EAO proposes the following provincial conditions and KMM under CEAA 2012:

- Condition 10: Construction Environmental Management Plan (provincial condition);
- Condition 11: Operations Environmental Management Plan (provincial condition);
- Condition 19: Air Quality Management Plan (provincial condition) and Air Quality Management Plan (KMM); and
- Condition 20: Greenhouse Gas Reduction Plan (provincial condition).

Residual Effects

After considering all relevant proposed mitigation measures, the EAO concludes that TMJ would have residual adverse effects due to increased GHG emissions for the Application scenario and BVS. The EAO's characterization of the expected residual effects of TMJ on GHG Management is summarized below and reflects the EAO's level of confidence in the effects determination (including their likelihood and confidence).

Table 11*: *Summary of residual effects to Greenhouse Gas Management.

Criteria	Assessment Rating	Rationale
Context	Moderate to high sensitivity	The Intergovernmental Panel on Climate Change (IPCC) has confirmed that GHG emissions are at levels that are affecting the global climate.
Magnitude	Low	For Application scenario and BVS, the maximum GHG emissions associated with TMJ-related vessels traveling from the TMJ site to the 12 nm limit may range from up to 29.22 to 31.64 kt CO_2e/yr, depending on the mix of domestic and international vessels. Total TMJ emissions, including only domestic vessels, are expected to be 15.25 kt CO_2e/yr for the Application scenario and 17.91 kt

Criteria	Assessment Rating	Rationale
		CO_2e/yr for the BVS. Both scenarios increase B.C.'s provincial GHG emissions by 0.02 percent over 2019 levels.
Extent	Global	The geographic effect of GHG emissions from TMJ is cumulative globally.
Duration	Long-term	CO_2 constitutes the majority of TMJ's GHG emissions. CO_2 remains in the atmosphere for 100 years or more.
Reversibility	Irreversible	Given current technology and the persistence of CO_2 in the atmosphere, the effects of the GHG emissions are effectively irreversible.
Frequency	Frequent to Continuous	The greatest emission sources, such as LNG bunker vessels and carriers, during operations are continuously emitting GHGs.
Likelihood	There is a high certainty that TMJ would emit GHGs.	
Significance Determination	In consideration of the conditions identified in the TOC and KMMs recommended under CEAA 2012 (Appendix 1), as well as the conservative nature of the predicted effects, the EAO concludes that TMJ would not have significant adverse effects on GHG Management.	
Confidence	The EAO has a high level of confidence in the magnitude of the residual effects based on the conservative nature of the GHG emissions. The GHG emissions estimates used a worst-case scenario based on the maximum expected vessel calls (i.e., 365 vessel calls) in any given year.	

5.2.5 CUMULATIVE EFFECTS ASSESSMENT

GHG emissions are a global issue, and the Intergovernmental Panel on Climate Change (IPCC) has produced several scenarios projecting potential global GHG emissions trajectories and the potential effects associated with these emissions levels. As such, the EAO did not require TMJ's Application to include a cumulative effects assessment for GHG emissions and the EAO did not conduct a cumulative effects assessment for the same reasons.

5.2.6 CONCLUSIONS

Considering the above analysis and having regard to the mitigation measures identified in the provincial TOC, including Condition 10: Construction Environmental Management Plan, Condition 11: Operations Environmental Management Plan, and Condition 19: Air Quality and Management Plan, and Condition 20: Greenhouse Gas Reduction Plan (which could become legally binding as conditions of the provincial EAC) and recommended KMM under CEAA 2012 for an Air Quality Management Plan (Appendix 1), the EAO is satisfied that TMJ would not have significant adverse residual effects on GHG Management.

5.3 RIVER PROCESSES

5.3.1 BACKGROUND

River Processes was assessed because TMJ components and activities, such as the jetty structure and dredging, have the potential to affect sediment processes, river currents, and geomorphology. River Processes was assessed as a Pathway Component (PC) as it has the potential to influence changes in end-of-pathway VCs including Water Quality (Section 5.5), Fish and Fish Habitat (Section 5.6), Marine Mammals (Section 5.7), Vegetation (Section 5.8), Wildlife and Wildlife Habitat (Section 5.9), Heritage Resources (Section 7.1), Land and Marine Resource Use (Section 8.2), and Current Use (Section 11.4) sections of this Report.

5.3.1.1 REGULATORY CONTEXT

The provincial *Water Sustainability Act* applies to the use and protection of water resources, including requirements with respect to any changes in or about a water course. The federal *Fisheries Act* provides for the protection of fish and fish habitat from harmful changes to and from depositing deleterious substances into habitats. The CEAA 2012 Section 5(1)(a)(i) requires an assessment of environmental effects on fish and fish habitat as defined in subsection 2(1) of the *Fisheries Act*. The federal *Canadian Navigable Waters Act* deals with interferences to navigation on navigable waters. TC administers this legislation and issues approvals to construct or place works in navigable waters. TC and VFPA are responsible for matters relating to dredging. VFPA are responsible for matters related to navigation in the lower Fraser River; it does not have regulatory obligations for TMJ.

5.3.1.2 BOUNDARIES

The LAA for River Processes includes the area upstream (approximately 4 km) of the TMJ site to the extent of the salt wedge (approximately the western tip of Annacis Island) and downstream of the TMJ site to Sand Heads. The RAA includes the entire South Arm of the Fraser River from New Westminster (approximately 10 km upstream of the TMJ site), including a portion of the Annacis channel, downstream to Sand Heads.

5.3.2 POTENTIAL PROJECT EFFECTS AND PROPOSED MITIGATIONS IN THE APPLICATION

5.3.2.1 BASELINE INFORMATION

River processes in the Fraser River have been affected since the early 20th century by development activities including flood protection dikes, bank hardening, and dredging. An annual navigational dredging is conducted by the VFPA in the Fraser River, which removes approximately 170,000 m^3 of dredge material from the Gravesend Reach where the TMJ site is located.

In the Gravesend reach, river bed material composition, changes in turbidity and total suspended solids (TSS), hydrology and water levels are largely affected by river discharge (flow rate through an area) and tidal influence from the Strait of Georgia. The maximum turbidity and TSS levels occur during the annual freshet but fluctuate daily due to the tides and river discharge. Water movement at the TMJ site is also affected by the formation of a salt wedge (mass of saline sea water underneath freshwater flowing downstream). The Application stated that turbidity and TSS levels caused by annual navigational dredging are not discernible from baseline levels, indicating that the natural processes like river discharge and tidal forces are the primary causes to changes in TSS and turbidity levels.

Geomorphology at the TMJ site is affected by sediment transport, which can influence bedforms, and by anthropogenic effects (e.g., dredging) which can create longer term changes. The Application noted that although there were changes in the Gravesend Reach bed elevation from year to year, there were no significant trends in scour or deposition from 2001 to 2017. In comparison, a channel bank comparison indicated that the TMJ site is an area of active deposition with infilling of salt marshes, formation of sediment bars and some channel migration and erosion.

5.3.3 POTENTIAL PROJECT EFFECTS

This section provides a summary of potential effects identified in the Application for River Processes during construction, operations and decommissioning of TMJ.

The Application included a Fraser River vessel wake assessment that estimated that wake generated by TMJ-related vessels would be less than those produced by other existing vessels in the LAA. “Wakewash” (the waves produced from the sides of the boats) at 50 m from the sailing line were estimated to be 0.03 m for LNG carriers and 0.17 m for LNG barges (similar or less than wake from current vessels in the Fraser River). The vessel wake assessment concluded that TMJ-related vessels travelling at their proposed speeds would have a very small effect on overall wake height in the river and vessel wake was not assessed further in the Application.

LOCAL CHANGES IN HYDRAULICS AND SEDIMENTATION RESULTING FROM THE DREDGE AREA AND SCOUR PROTECTION

During construction and operations, the Application predicted velocities of the river current (velocities) would be reduced by around 0.2-0.3 metres per second (m/s) in the berth area and adjacent navigation channel. The Application also predicted that velocities would be increased on the mudflat (sidebar) downstream of the berth area by up to 0.05-0.10 m/s. The Application explained that the typical annual variation in channel velocities was 2.8 m/s (ranging from -1 m/s to 1.8 m/s); therefore, the predicted changes from TMJ would be within baseline variation.

In terms of local morphological changes, the Application estimated the dredge area would have depths ranging from 0 to 5 m below the present river bed level. Over a period of two years, sediment would accumulate in the dredge area (up to 2.5 m), necessitating maintenance dredging. Dredging would result in an increase in sediment accumulation behind the dredge area at the shoreline and an increase in erosion at the downstream edge of the dredge cut and on the upstream flat. During decommissioning, the Application predicted that there would be natural (and manual, if needed) infilling such that the river would re-equilibrate with surrounding conditions. The Application compared predicted effects from TMJ to historical bathymetric changes and concluded that the modelled changes were within the baseline variation of river bed changes of plus or minus several metres.

LOCAL CHANGES IN HYDRAULICS AND SEDIMENTATION AROUND IN-RIVER STRUCTURES

The Application reviewed effects of neighbouring in-river structures on patterns of sedimentation as the morphological model was not able to predict effects on in-river structures and floating objects. The Application stated that during construction, the FTBB would extend a similar distance into the river as the existing timber piles such that expected changes in local sedimentation and erosion from these changes would be within baseline conditions.

RELEASE OF FINE SEDMENTS

The Application described the two main pathways, dredging and propeller wash, for the mobilization and suspension of fine sediments, which might increase TSS and turbidity in the LAA.

Dredging during construction would remove approximately 500,000 m^3 of material and could increase TSS and turbidity by releasing fine sediments. The Application compared estimated increases in TSS at a distance of 100 m from TMJ dredging with estimated TSS increases at a distance of 100 m from historical channel maintenance dredging (the latter were not distinguishable from ambient TSS levels outside of freshet). The Application predicted that dredging during construction would cause:

- negligible additional fine sediment suspension during high flows (increases of 2-4 milligram per litre [mg/L] in flows >3,000 cubic metres per second [m^3/s]); and
- non-negligible fine suspended sediment (same order of magnitude as “baseline” conditions) during low flows (increases of 8-15 mg/L of sediment in flows <3,000 m^3/s).

The Application estimated that over 14,000 vessel transit pass the TMJ site annually, but that there is no baseline information on the propeller (prop)-wash[42] from these vessels. TMJ would increase vessel traffic by approximately 2 percent in that reach of the Fraser River. A supplemental report[43] provided by TJLP to assess propeller scour found that sediment mobility associated with prop-wash would vary with a variety of factors (for example, the vessel power, water flow). Baseline water velocity near the river bed ranged from 0.95 m/s in low flows to 1.64 m/s in an ebb tide. The maximum incremental change from TMJ -related vessels accessing and egressing from the jetty to baseline water velocity near the river bed from propellers was predicted to vary from 0.25 m/s for a tug boat in low flows to 1.8 m/s for an LNG carrier in the freshet ebb tide scenario (the latter would be the result of the combined influence of the prop-wash and natural river forces). The supplemental report also predicted that scour effects would be minor (up to 8 millimetres [mm] scour depth per vessel) and would be short term (the duration of each vessel manoeuvre), but that this would be within the existing levels of variation in the TMJ area.

REGIONAL CHANGES IN SEDIMENTATION

Sediment input enters the Fraser River through suspended sediments in river flow from the upper reaches of the river and removals occur through dredging or sediment leaving the river and depositing in the Strait of Georgia. TJLP predicted that the existing requirement for navigational dredging combined with TMJ maintenance dredging would total 295,000 m^3/year at Gravesend Reach. Although there is large uncertainty and high variability in the annual sediment budget, the Application predicted that the proposed dredging during construction and operations (295,000 m^3/year) would be a small fraction of the available sediment surplus predicted for the Gravesend Reach (8.5 million m^3/year) and that TMJ would not result in regional morphological changes.

BUNKER VESSEL SCENARIO

For the BVSA, TJLP considered whether the proposed increased bunker activity would change the characterization of effects on river currents, sediment processes, and geomorphology from vessel loading, berthing and departure activities.

For vessel loading, similar to the Application, berthed vessels were treated as floating

[42] The term for the currents behind the propeller of vessels, which could cause scour disturbance to the river bed, shorelines and intertidal areas.

[43] TJLP's Propeller Scour Assessment dated July 11, 2019 (https://projects.eao.gov.bc.ca/api/public/document/60a489f9148b4a0023306081/download/20190711_Prop%20Scour_River%20Processes.pdf).

structures that may affect local river currents and, as a result local river geomorphology and sedimentation. TJLP stated that the effect of vessel calls, which are transient in nature, on river currents is anticipated to be small in comparison to the effects of in-water structures and dredging proposed for TMJ. The effects of LNG carriers on river currents are considered small compared to the effects of in water structures, and bunker vessels are smaller (approximately 14 times smaller in terms of DWT) with a shallower draft and narrower beam. As such, bunker vessels and ATBs are expected to have less of an effect on river currents than LNG carriers. TJLP noted the average time for vessel loading, from berthing to departure, is shorter for the bunker vessels and ATB (7 to 12.3 hours) than for LNG carriers (22.0 hours).

For berthing and departure activities, it is expected that bunker vessels would have near-river bed propeller-generated velocities and scour potential similar to those of tugboats that were modelled as part of the Application. TJLP expects bunkering to result in scour of <1 mm, which is predicted to be within the natural variation of the system, while LNG carriers may result in minor scour (7.2 mm). Because of the short duration of each vessel maneuver in the river, TJLP expected river flow to dominate the morphologic changes in the river over longer time scales.

In the Application, wake associated with TMJ-related vessels was estimated to be less than the wake of other vessels operating in the Fraser River shipping lanes and the interaction was assessed as negligible. TJLP concluded that the increased frequency of vessels would not change the magnitude of the effect (e.g. the wake waves associated with the bunker vessels are not large enough to have an impact in the BVSA); as such the interaction remains negligible, consistent with the Application.

TJLP considered the proposed mitigation measures for TMJ as part of proposed federal and provincial conditions for TMJ and did not propose additional mitigation measures for River Processes. TJLP concluded that the BVSA is not predicted to change the residual effects or characterization presented in the Application, and that the effects to river currents and river geomorphology as a result of the BVSA are predicted to be negligible.

5.3.4 MITIGATION MEASURES PROPOSED IN THE APPLICATION

The Application did not propose any mitigation measures for river processes; however, the following monitoring and follow-up programs were proposed:

- **Annual sounding surveys:** Annual monitoring of the river bed covering the extent of the TMJ site to monitor potential changes in scour and erosion. The surveyed river bed elevations would be regularly compared to evaluate short and long terms trends; and
- **Analysis of reach-wide bathymetry data:** A reach-wide bathymetry comparison to identify any long-term effects in river bed morphology from removing sediment conducted approximately every five years during operations.

No additional mitigation measures were proposed by TJLP as part of the BVSA.

5.3.5 POTENTIAL PROJECT EFFECTS AND PROPOSED MITIGATIONS IDENTIFIED DURING APPLICATION REVIEW

The following key issues related to the assessment of River Processes for TMJ were identified during Application review and based on feedback from the Working Group:

- Potential effects on dike infrastructure;
- River bed monitoring and mitigation; and
- Effects assessment and mitigation.

POTENTIAL EFFECTS ON DIKE INFRASTRUCTURE

Richmond raised concerns about potential effects of TMJ's dredging on Richmond's existing and future diking infrastructure across the river from the TMJ site. Richmond requested a liquefaction and geotechnical analysis to quantify effects of dredging to Richmond's dike infrastructure.

> TJLP noted that TMJ dredging would not extend north beyond the existing navigation channel; therefore, it would be unlikely that any TMJ-related effects would negatively affect Richmond's flood protection infrastructure. TJLP explained that dredging and the associated steepening of river bands can affect the stability of shoreline slopes under both static and seismic conditions. The steeper part of the TMJ dredge cut would be closer to the south bank, which would limit instability effects and lateral spreading hazards mostly to the area local to the south bank (that is, to the Delta side). TJLP explained that the dredging would flatten out the existing river bed slope, which would reduce liquefaction-induced geohazards on the Richmond side. TJLP issued a memo[44] signed and sealed by a consulting engineer that included this information and concluded that the effect of the dredge with respect to geo-hazards would be very much limited to the south bank of the river with minimal effects to the north (Richmond) side.

Richmond informed the EAO that it was satisfied with the information provided and the EAO is of the view that this issue has been adequately addressed for the purposes of the EA.

RIVER BED MONITORING AND MITIGATION

Musqueam Indian Band, Tsawwassen First Nation, and Tsleil-Waututh Nation requested that the monitoring programs for river processes include follow-up plans to address potential variation from predicted effects, in addition to mitigation and offsetting measures. Tsleil-

[44] Response to City of Richmond Comments CoR-01.1 and CoR-11.1 dated September 25, 2019 (https://projects.eao.gov.bc.ca/api/public/document/60a492b2148b4a0023306103/download/20190925_CoR_River%20Processes.pdf).

Waututh Nation also recommended that bathymetry surveys be combined with other environmental surveys to fully understand TMJ-related changes at the ecosystem level.

> TJLP responded that the Application predicted residual effects to river processes due to uncertainty surrounding the sediment budget due to its seasonal and annual variability. TJLP concluded that changes to river bed morphology would be within natural variability and limited to the LAA; therefore, monitoring of river beds was an adequate and conservative response. TJLP noted that mitigation measures to address changes in morphology within the LAA could include scour protection or changes in dredging (volume, schedule). The monitoring measures would be provided in the operations Plans would be developed in consultation with Indigenous Groups, including Tsawwassen First Nation, Tsleil-Waututh Nation and Musqueam Indian Band.

EFFECTS ASSESSMENT AND MITIGATION

Tsawwassen First Nation and Musqueam Indian Band raised concerns about the assessment of effects on river processes and the implications of these effects on other VCs and their rights. These concerns included the following:

- Lack of clarity on the how Indigenous knowledge was used in the understanding of baseline conditions;
- Lack of consideration of how location-specific effects on river processes would affect vegetation, fish (e.g., eulachon, juvenile salmonids and sturgeon) and fishing; and
- Need to assess cumulative effects on the river system, using Indigenous knowledge.

The Application noted that the Indigenous knowledge obtained through consultation with Indigenous Groups and available through other sources provided no specific information on River Processes.

Location-specific effects to fish and fish habitat and vegetation are assessed in Fish and Fish Habitat chapter (Section 5.6) and Vegetation chapter (Section 5.8). The EAO assessed the incremental effects of TMJ based on current ecological conditions. The EAO does not assess the effect of a proposed project compared to a historic baseline (i.e., pre-industrial conditions), but notes that the effects of past activities are reflected in current conditions. Potential effects to Indigenous Interests and Treaty Rights are assessed in Part C and draw from the findings of Part B (effects assessments on VCs).

The EAO proposes Condition 13: River Bed Monitoring Plan to address adverse effects to the river bed, including monitoring and mitigation of effects caused by dredging and a requirement that it be developed by a Qualified Professional (QP) in consultation with Indigenous Groups, including Tsawwassen First Nation. The plan would require monitoring parameters related to fish habitat. The EAO also recommends KMMs under CEAA 2012 for Fish Mitigations to Reduce Harm and Mortality, and River Processes Monitoring that would include consideration of

location-specific effects on bathymetry and fish habitat. In addition, most of the conditions/ plans would also include requirements to consider additional traditional use information shared by an Indigenous Nation. Based on the above analysis, the EAO is of the view that the assessment and mitigation of effects to river processes is adequate for the purposes of the EA.

5.3.6 THE EAO'S ANALYSIS AND CONCLUSIONS

This section presents the EAO's conclusions on the potential adverse residual effects from TMJ to River Processes.

Proposed Provincial Conditions and Key Mitigation Measures (CEAA 2012)

Based on mitigations proposed in the Application and issues raised during Application review, the EAO proposes the following provincial conditions and recommends KMMs under CEAA 2012:

- Condition 10: Construction Environmental Management Plan (provincial condition); and
- Condition 13: River Bed Monitoring Plan (provincial condition) and River Processes Monitoring (KMM) to monitor for and mitigate potential adverse effects to the river bed caused by dredging.

Residual Effects: After considering the proposed mitigation measures, the EAO concludes that TMJ would result in the following potential residual adverse effects to the River Processes for the Application scenario and BVS:

- Change in sediment processes:
    - Construction and operational dredging could cause increases of fine sediments, as compared to historical maintenance dredging ("baseline"); and
    - Prop-wash could cause a short-term effect of up to 8 mm of scour depth per vessel and increased sediment mobility near the river bed from propeller-induced near river bed velocities;
- Change in river currents:
    - Construction and operations dredging could cause a reduction of river velocity in the berth area and in the adjacent navigation channel; and
    - An increase in velocity downstream of berth area;
- Change in geomorphology:
    - Increase in deposition behind the dredge area at the shoreline; and
    - Increase in erosion at the downstream edge of the dredge cut and on the upstream flat.

The EAO's characterization of the expected residual effects of TMJ on the River Processes PC (Table 12) is summarized below, as well as the EAO's level of confidence in the effects determination (including likelihood).

Table 12: Summary of Residual Effects to River Processes

Criteria	Assessment Rating	Rationale
Context	Moderate resilience	Levels of TSS and turbidity in the Fraser River, including the Gravesend Reach, vary seasonably. Levels are affected primarily by river discharge and tidal forces. Seasonal flow conditions are highly dynamic
Magnitude	Low to Moderate	**Changes to sediment processes**: • **Dredging low tides** - Moderate: the predicted increases to TSS (8-15 mg/L) are the same order of magnitude as baseline conditions. • **Dredging high tides -** Low: the predicted increases to TSS from dredging (2-4 mg/L) are within baseline conditions. • **Prop-wash** - Low: the predicted increases to near river bed velocities and scour effects are within or less than the range of natural river morphology change. **River currents** - Low: Predicted changes to river currents of +/-0.3 m/s would be within the range of baseline variation (-1 to 1.8 m/s). **Local Geomorphology** - Low: Predicted effects to local sedimentation and erosion due to the dredge area and scour protection would be within the baseline levels of variation plus or minus several metres.
Extent	Local	All predicted effects would be limited to the LAA.
Duration	Long-term	Predicted effects in increased suspended sediments disturbances from prop-wash, changes to river currents and local erosion and sedimentation are anticipated for the life of the TMJ.
Frequency	Frequent/ Continuous	Frequent: Increases to suspended sediments would occur annually during dredging and disturbances from prop-wash would occur during vessel operations for both Application scenario and the BVS, in particular during LNG carrier operations. Continuous: Predicted changes to river currents and local patterns of sedimentation and erosion would be continuous throughout the life of the TMJ.
Reversibility	Reversible	Effects would be reversible, once dredging and vessel operations cease, and infrastructure removed.
Likelihood	There is a high likelihood of increase in turbidity and suspended sediments, effects from prop-wash, changes to river currents and local patterns of erosion and sedimentation.	
Confidence	There is a moderate degree of confidence that sediment processes, river currents and geomorphology would change due to TMJ. There is a high level of natural variability in Fraser River flows and sediment transport yields regular changes of several metres in bed levels and introduces a high degree of inherent uncertainty in model predictions.	

Note: Criteria and assessment ratings are defined in Appendix 5: Residual Effects Characterization Definitions.

5.3.7 CUMULATIVE EFFECTS ASSESSMENT

As River Processes is a PC, there is no requirement for a cumulative effects assessment. The residual effects from River Processes are incorporated into the assessments of linked VCs, which is where cumulative effects assessment would occur.

5.3.8 CONCLUSIONS

River Processes is a PC. Therefore, the significance of residual effects is assessed in the linked VCs.

5.4 VESSEL WAKE

5.4.1 BACKGROUND

Vessel Wake was selected as a PC to be included in the MSA due to the possibility of LNG carrier and bunker vessel movement creating wake waves which could potentially cause shoreline erosion, affect fish habitat or otherwise affect heritage resources, vegetation, and nearshore areas. Environmentally sensitive areas in the MSA include Important Bird Areas, wildlife critical habitat, rockfish conservation areas, national parks and park reserves, and provincial parks, sanctuaries and management areas. Tsawout First Nation has reported that vessel wake can cause disruptions and visibility challenges during seafood harvesting. Cowichan Nation Alliance[45] has also raised concerns regarding potential risk of vessel wake-associated erosion near a number of the Gulf Islands.

The vessel wake assessment is related to the following VCs: Marine Fish (Section 5.6), Marine Mammals (Section 5.7), Marine Birds (Section 5.9), Heritage Resources (Section 7.1), Marine Use (Section 8.2), and Current Use (Section 11.4).

The vessel wake assessment conducted by TJLP was based on two indicators:

- Increase in wave energy at shoreline – annual wave energy at affected shorelines due to TMJ-Related Vessel Wake (as a Percentage of Existing Annual Wind Wave Energy); and
- Increase in wave power at shoreline – annual wave power at affected shorelines due to TMJ-Related Vessel Wake (as a Percentage of Existing Annual Wind Wave Power).

[45] Cowichan Nation Alliance represents Cowichan Tribes, Halalt First Nation, Penelakut Tribe and Stz'uminus First Nation.

Wave energy is defined as the amount of energy transported in each wavelength, while wave power is the rate of transmission of wave energy through a wave group.

5.4.1.1 REGULATORY CONTEXT

Though no legislation or guidelines speak specifically to vessel wake, TJLP considered the following legislation and guidelines as relevant to the Vessel Wake PC:

- Canada *Fisheries Act*;
- CEAA 2012 including Section 5(1)c;
- *Migratory Birds Convention Act,* 1994; and
- Vancouver Fraser Port Authority Project & Environmental Review Guidelines – Habitat Assessment Guidelines.

5.4.1.2 BOUNDARIES

The spatial boundary of the MSA Area, which includes the area of the vessel wake assessment, covers the extent of TMJ-related inbound and outbound shipping that would take place between Sand Heads and the 12 nm limit. The MSA Area considers areas where effects might be expected from vessel wake, from source vessels in the shipping lane to shorelines. The MSA Area was separated into segments A through G to better understand the potential effects in smaller, discrete areas.

5.4.2 POTENTIAL PROJECT EFFECTS AND PROPOSED MITIGATIONS IN THE APPLICATION

5.4.2.1 BASELINE INFORMATION

The MSA assessed the existing vessel wake conditions using the following information sources:

- RBT2 Environmental Impact Statement[46];
- RBT2 Marine Shipping Supplemental Report[47];
- Port of Vancouver responses to Federal Panel Information Requests (Information Request Package 7 from the Review Panel for the RBT2 EA)[48];

[46] Roberts Bank Terminal 2 (RBT2) Environmental Impact Statement (https://iaac-aeic.gc.ca/050/evaluations/document/101482?culture=en-CA).

[47] RBT2 Marine Shipping Supplemental Report (https://iaac-aeic.gc.ca/050/evaluations/document/103683?culture=en-CA).

[48] Port of Vancouver responses to Federal Panel Information Requests (Information Request Package 7 from the Review Panel for the RBT2 EA), dated November 20, 2017 (https://iaac-aeic.gc.ca/050/documents/p80054/121106E.pdf).

- TransMountain Expansion Study[49]; and
- TJLP's Navigation Study for TMJ on LNG Cargo Loading and Marine Transit Risk Assessment in keeping with the Technical Review Process of Marine Terminal Systems and Transhipment Sites (TERMPOL) requirements under Element 3.13 Risk Assessment[50].

The MSA vessel wake assessment did not include information on Indigenous knowledge. However, the EAO heard directly from Indigenous Groups about their lived experience with respect to vessel wake, including and via the RBT2 Panel process, which has been captured below.

In the assessment, wind wave energy was assumed to be the same for RBT2, as TMJ and RBT2 assessed effects using the same MSA area. Wave energy was calculated using the estimated number of vessel-generated waves that would affect shorelines annually under both calm conditions and all wind wave conditions. The wave energy data then informed the vessel wake model conducted for the MSA area. The model included assumptions related to vessel speed (12.5 knots), annual vessel movement (236 vessel movements), number of waves per vessel movement (5), design vessel shape and other factors.

Through this analysis, three zones within Segment B were identified as being susceptible to effects from erosion caused by vessel wake due to the proximity of shorelines to the shipping lanes (Figure 4):

- Zone 1: Eastern ends of Tumbo and Saturna Islands:
  - Low energy wave climate; predominately North West and South East waves
- Zone 2: Western end of Stuart Island:
  - Low energy wave climate; predominately South and South East waves
- Zone 3: Vancouver Island in the vicinity of Victoria/ Discovery, Chatham, Chain and Trial Islands:
  - Higher energy wave climate; predominately South West waves.

[49] TransMountain Expansion Study; and Full study (https://apps.cer-rec.gc.ca/REGDOCS/Item/View/2392873 and Marine Transportation (http://transmountain.s3.amazonaws.com/application/V8A_1_of_4_1_TO_4.2.9_MAR_TRANS_ASSESS.pdf).

[50] TJLP's TMJ Tilbury Termpol Element 3.13 Risk Assessment dated August 2018 (https://projects.eao.gov.bc.ca/api/document/5cb902471e9bd50024762621/fetch/1.0-1_Navigation_Study.pdf).

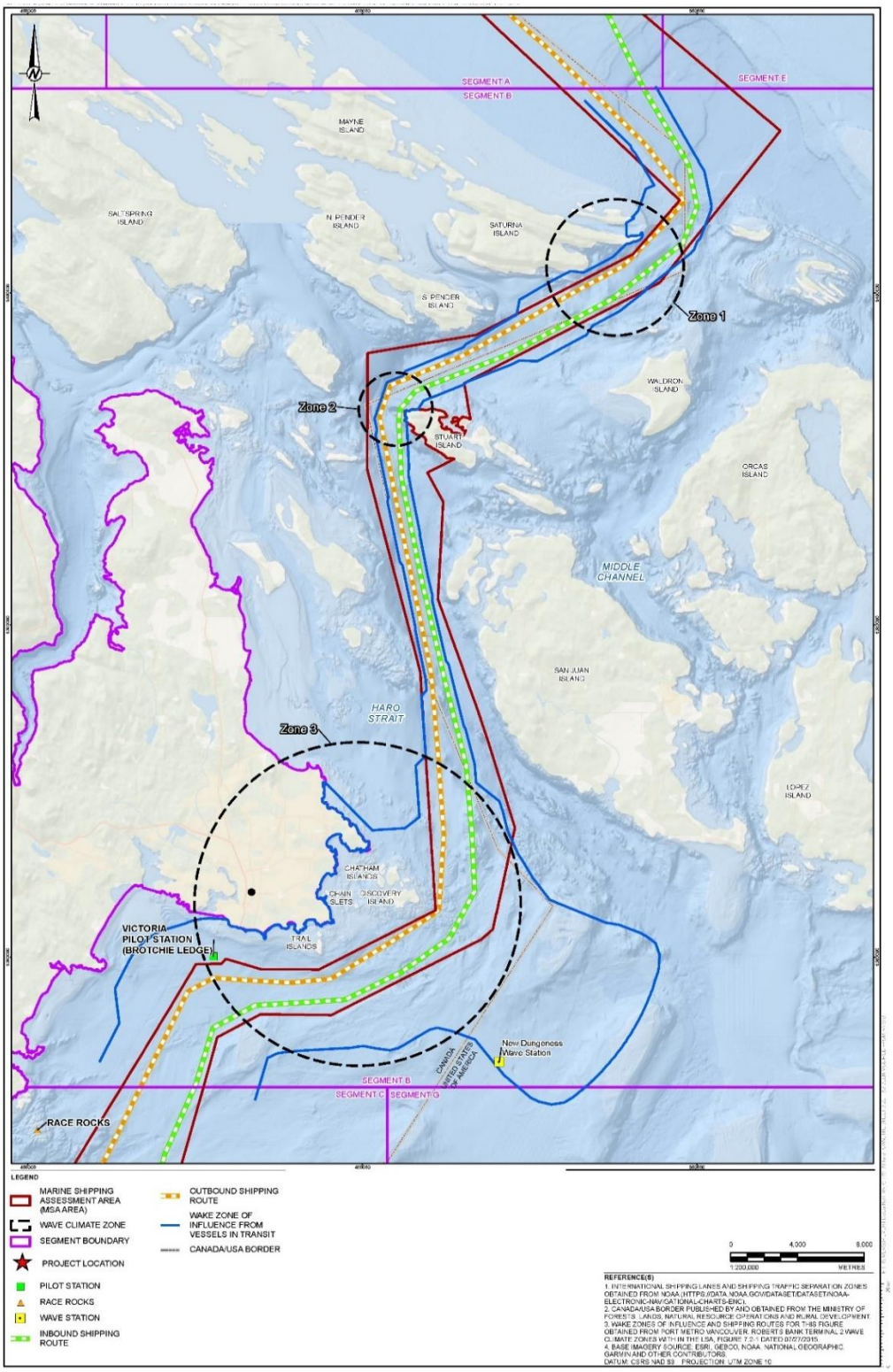

Figure 4: Wake Zone of Influence

5.4.2.2 POTENTIAL PROJECT EFFECTS

VESSEL TRANSIT - WAKE

Waves generated by vessel wake from TMJ-associated shipping have the potential to affect shorelines at Zones 1-3. Potential effects were expressed as a percentage increase over the existing wave energy and power to determine the magnitude of change in the wave environment.

The MSA showed that the increase in wave power and energy due to vessel wake were very small in comparison to the existing natural wave environment, or wave climate, with a majority of wake waves predicted to be between 10 and 12.5 cm in height once they arrive at shorelines in Zones 1 through 3. The greatest predicted increase in wave energy and power would occur in Zone 3.

The total TMJ-related increase in wave energy at all affected shorelines per year for all three zones combined was predicted to result in a 0.0013 percent increase when considering only calm conditions and a 0.0050 percent increase when considering all wave conditions. The total annual increase in wave power was calculated to be 0.00079 percent under calm conditions, and 0.0030 percent under all conditions. The MSA also predicted the increase in wave energy and power at potentially affected shorelines is expected to be very small in comparison to the current wave climate at all three zones. The MSA concluded that the effect of vessel wake caused by TMJ-related shipping would be negligible in comparison to baseline conditions.

5.4.2.3 MITIGATION MEASURES PROPOSED IN THE APPLICATION

TJLP did not propose any mitigation measures as the wave energy caused by TMJ-related vessel wake was expected to be negligible in comparison to baseline wave energy, based on the current estimates of vessel speed, size, shipping volume and shipping route.

5.4.3 POTENTIAL PROJECT EFFECTS AND PROPOSED MITIGATIONS IDENTIFIED DURING APPLICATION REVIEW

The following key issues related to the assessment of Vessel Wake for TMJ were identified during Application review and based on feedback from the Working Group.

STUDY DESIGN AND MODELLING

Marine Shipping Working Group members and the Agency had several questions regarding how the vessel wake study was designed and potential implications of these design choices in the study's conclusions. For instance, the Agency sought clarification regarding how the number of vessels per week in the outbound shipping lane was calculated and inquired whether there would be the potential for bunker vessels to result in greater wake effects than the LNG carriers.

Tsleil-Waututh Nation questioned why vessel wake was only assessed within Segment B, noting other segments were within reach of cultural sites or the shoreline generally and could be potentially affected, and why Pender Island and Mandarte Island were not included in the assessment. Pacheedaht First Nation commented about the design of the study, noting concerns about higher vessel speeds and closer distances to LNG vessels in the area of Swiftsure Bank, and of differences between the direction and frequencies of wake-generated waves compared to natural waves. Tsawwassen First Nation informed the EAO that potential changes in wave conditions, real or perceived, may affect Tsawwassen First Nation members' use of and experiences in their traditional territory. Additionally, the EAO reviewed the RBT2 Panel report and notes that Ditidaht First Nation, Maa-nulth First Nations, Cowichan Nation Alliance, Pauquachin First Nation, and Tsawout First Nation raised concerns about vessel wake and safety in the RBT2 process.

TJLP responded that the vessel wake analysis was expected to be conservative as the modelling of the vessel wake zone of influence assumed both LNG carriers and bunkering vessels to be operating at faster cruising speeds than would actually occur during operations. Consequently, the model overestimates the area which would be affected by discernible wake waves. Additionally, the wave energy analysis overestimated the number of measurable wake waves predicted as a result of each vessel movement (5 waves vs. 3 waves). This means that the potential wave energy and power predicted in the assessment are greater than the number expected to occur during operations. Additionally, TJLP provided information to demonstrate that the assumed speed of 12.5 knots would be conservative, as escorted carrier vessels are expected to travel at 10 knots, while bunker vessels would travel at 12 knots. TJLP also noted that the waves generated by vessel wake from TMJ-related shipping would be expected to be well within the natural variation of the wave environment in the MSA area, as the predicted increases in wave energy due to TMJ are very small. Another factor which is also expected to reduce vessel speeds at key times is the VFPA-led ECHO Program seasonal slowdown initiatives, which TJLP has committed to.

Regarding the assessment being limited to the area of Segment B, TJLP responded that Segment B was determined to be the only area where waves generated in the shipping channel could reach the shore and the only area with a calmer wave climate where vessel wake might have an effect. TJLP noted that waves would be expected to be indistinguishable from the existing wave climate at the greater distances and higher energy wave climates in the other Segments – for example, Race Rocks (in Segment C) is located over 4 km from the shipping lane, and by the time waves from the shipping lane reach Race Rocks, they would be so small as to be indiscernible from the natural wave environment. Even in Segments where the shoreline is closer to the shipping lanes, wake waves generated by TMJ vessels are expected to be well within the normal level of variability in the natural wave environment.

In Segment D (which includes Swiftsure Bank), TJLP compared the modelled wave heights against natural wave heights as recorded in the area at National Oceanic and Atmospheric Administration (NOAA) Wave Buoy #46087. Modelling indicated that TMJ vessel-generated wake waves would be expected to be indistinguishable from the high-energy natural wave conditions present on Swiftsure Bank. TJLP provided additional analysis in response to further concerns from Indigenous Groups about the PIANC model potentially underestimating wave heights at Swiftsure Bank due to the shallower water depth in that area. The additional analysis used a version of the PIANC model that uses shallow water depths, which assumed a 40 m water depth at Swiftsure Bank. The results of this analysis showed that TMJ-related vessel wake waves, when received at 350 m from the source vessel, are expected to be 0.13 m high if the vessel is travelling at 12.5 knots and 0.31 m if the vessel is travelling at 15.5 knots. TJLP noted that both are within the normal variability of the wave environment at Swiftsure Bank.

The EAO is satisfied with TJLP's responses to questions and clarifications about study design and modelling of vessel wake. In consideration of Pacheedaht First Nation's concerns regarding the effects of vessel wake on traditional activities, the EAO considers this issue to the assessment of potential effects of Current Use (Section 11.4) of this Report.

5.4.4 THE EAO'S ANALYSIS AND CONCLUSIONS

Having considered the information provided by TJLP and comments provided by Marine Shipping Working Group members, the EAO is of the view that vessel wake is expected to be within the range of natural variation and does not predict any residual adverse effects. As no residual effects are expected, and as this is a PC, the EAO has not conducted a cumulative effects analysis related to vessel wake. Concerns raised by Indigenous Groups regarding the effects of vessel wake are also addressed in Current Use (Section 11.4) and in Part C of this Report.

5.5 WATER QUALITY

5.5.1 BACKGROUND

Water Quality was selected as a VC due to its importance to public health and Indigenous Groups, its potential to affect fish, wildlife, and aquatic habitats, and water is a regulated resource. Water Quality was assessed through surface water quality, sediment quality and aquatic health.

Results of the water quality assessment were incorporated into the assessments of potential effects to Fish and Fish Habitat (Section 5.6), Marine Mammals (Section 5.7), and Human Health (Section 6.1) of this Report. For the EAO's assessment of potential effects of dredgeate disposal

to Water Quality, refer to the Alternative Means of Undertaking the Project chapter (Section 2.2.5) in this Report. The potential effects of accidents and malfunctions are assessed in the Accidents and Malfunctions chapter (Section 9) of this Report.

The MSA did not assess potential effects to Water Quality as the EAO does not predict potential pathways of effect from marine shipping to water quality. The EAO notes that potential effects from bilge or ballast water discharge would be sufficiently managed through adherence to federal regulations (*Canada Shipping Act*, 2001) and international conventions (for example, the MARPOL Convention) that prohibit these activities in the MSA. Similarly, grey water discharge is regulated through the Vessel Pollution and Dangerous Chemicals regulation of the *Canada Shipping Act,* 2001.

5.5.1.1 REGULATORY CONTEXT

The provincial *Water Sustainability Act* applies to the use and protection of water resources, including requirements with respect to any changes in or about a water course. The BC *Environmental Management Act* prohibits the introduction of waste into the environment unless the introduction of that waste is conducted in accordance with a permit, approval, order or regulation. The federal *Fisheries Act* protects fish and fish habitat from harmful changes and deposition of harmful substances. Disposal of dredged material at sea is subject to the DAS Regulations under the *Canadian Environmental Protect Act.*

The Application references a variety of science-based provincial and federal water and sediment quality guidelines, including the CCME Canadian Environmental Quality Guidelines (CEQG), the BC Ministry of Environmental and Climate Strategy Water Quality Guidelines (BC WQG) and the BC Working Water Quality Guidelines. The Application also considers ambient water and sediment quality objectives specific to the South Arm of the Fraser River (Surface Water Quality Guidelines [SWQGs] for sediments and Fraser River Sediment Quality Objectives [FROs], and Fraser River Ambient Water Quality Objectives [FRWQO]).

5.5.1.2 BOUNDARIES

The LAA includes the aquatic areas of the TMJ site including the nearshore and foreshore habitats associated with the footprint of the jetty and the dredge area, a 500 m buffer upstream of the site and a 100 m buffer downstream of the TMJ site. The 500 m upstream buffer was established to consider potential water quality effects upstream of TMJ site due to tidal influence. Riparian areas are assessed under the Vegetation (Section 5.8) and Fish and Fish Habitat (Section 5.6) VCs. The RAA includes the South Arm of the Fraser River downstream of the TMJ site to Sand Heads and includes the same upstream buffer as the LAA.

5.5.2 POTENTIAL PROJECT EFFECTS AND PROPOSED MITIGATIONS IN THE APPLICATION

5.5.2.1 BASELINE INFORMATION

The Application included a review of regional, provincial and federal water quality data, and reported on field studies conducted by TJLP including sediment and foreshore (water) characterization reports in the TMJ site area. The sampling study was comprised of 25-surface grab samples taken across the site, and five sonic drill sediment cores at separate locations in the dredge berth pocket.

SURFACE WATER QUALITY

The TMJ site is located in the Gravesend Reach of the Fraser River, which is slightly alkaline, has seasonal patterns of dissolved oxygen concentrations (highest in winter months), and naturally high levels of TSS during freshet when sediment is transported downstream. Annual navigational dredging occurs in the Gravesend and neighbouring reaches of the Fraser River. From 2015 to 2017, this dredging removed 306,000 to 582,000 m^3 of material annually. TJLP considered water quality conditions with the presence of this navigational dredge to be baseline conditions. Surface water quality parameters assessed include:

- *TSS and Turbidity*: The Application noted that navigational dredging did not coincide with identifiable increases in turbidity or TSS. Levels of TSS remained within the range of existing variability which is primarily driven by the tide and river discharge;
- *Metals and Nutrients*: During freshet, total concentrations of aluminum, chromium, copper, iron, zinc and phosphorus measured above FRWQO and BC WQG.;
- *Bacteriological Parameters*: The Application found fecal coliforms and *Escherichia coli* (*E.coli*) were below FRWQOs; and
- *Organic Constituents*: Organic constituents, including pesticides, alkylphenols, polychlorinated biphenyls (PCBs), and polycyclic aromatic hydrocarbons (PAHs) were below FRWQO and applicable water quality guidelines (that is, BC WQG and/ or CEQG) near the Annacis Wastewater Treatment Plant outfall in 2018 or the TMJ site in 2014.

SEDIMENT QUALITY

In the LAA, sediment varies from fine sediment in the nearshore to unconsolidated sand with a lower proportion of fines toward the centre of the river. Sediment quality parameters assessed include:

- *Metals*: The Application found that arsenic, chromium, copper, iron, manganese and nickel in some samples in the dredge pocket were above B.C. sediment quality guidelines. However, it noted that maximum concentrations were less than 95th percentile for the South Arm of the Fraser River, indicating that levels are on par with ambient conditions in the Fraser River that is influenced by natural geological inputs.

- *PAHs*: Concentrations of total and individual PAHs were lower than B.C. sediment quality guidelines in all but three samples. In the three samples, individual PAH levels exceeded guidelines and the 95th percentile for the area.
- *Dioxins and Furans:* Concentrations were above guidelines in some sediment samples, but were below the 95th percentile, suggesting that levels reflect ambient conditions in the Fraser River.

5.5.2.2 POTENTIAL PROJECT EFFECTS

This section provides a summary of potential effects identified in the Application for Water Quality during construction, operations and decommissioning of TMJ and considered if FRWQO, BC WQG or CEQG would be exceeded at the assessment point (defined as the outer boundary of the work zone 100 m from the source of TMJ activities).

INCREASED SUSPENDED SEDIMENT DUE TO SEDIMENT DISTURBANCE

The Fraser River naturally carries a high sediment load. The Application explained that TMJ might increase TSS levels through sediment disturbance through a variety of activities, with dredging potentially causing the most disturbance. The Application predicted the total initial volume of materials dredged during construction would be 510,000 m^3, at a rate of 14,000 m3 per day, over 36 working days.

The Application compared the predicted increases in TSS from TMJ dredging to TSS increases from recent navigational dredging because it has generated suspended sediment levels that are not distinguishable from downstream sediment transport in the river. The total capital dredge is estimated to be twice the volume of the recent (January 2018) navigational dredge in the Gravesend Reach and neighbouring reach. The Application estimated that TSS levels during construction at the point of assessment (100 m from the point of discharge) would result in predicted TSS levels of 14-54 milligrams per litre (mg/L), higher than the TSS increase estimated from past navigational dredging (8-31 mg/L). The Application predicted that TSS levels would remain within the range of natural variability at high and low flows. TSS levels are expected to remain below those that would cause adverse effects to fish.

During operations, annual maintenance dredging is expected to be approximately 125,000 m^3 per year which would increase the levels of TSS. Although this is considered a residual effect, the lower volume of dredging involved in maintenance dredging compared to capital dredging (approximately a quarter of the volume) means increases in TSS would also be expected to be lower than from capital dredging. The Application also noted that propellers on arriving and departing vessels could re-suspend sediments but that the effects on the re-suspension of sediment would be negligible.

REMOBILIZATION OF TRACE METALS AND ORGANIC CONSTITUENTS FROM DISTURBED SEDIMENTS

Metals, Dioxins, Furans

The Application reported that sediment concentrations of metals (arsenic, chromium, copper, iron, manganese and nickel) and dioxins and furans at depth and surface in the dredge area were currently above BC sediment guidelines. The maximum concentrations of these metals were less than the 95th percentile of sediment concentrations measured by the Fraser River Ambient Monitoring Program (FRAMP). The Application concluded that the levels are similar to those in the surrounding lower Fraser River sediment and do not represent a contaminant source.

Polycyclic Aromatic Hydrocarbons (PAHs)

PAHs have varying degrees of toxicity to aquatic organisms. In most samples, concentrations of individual PAHs were less than the SWQG and FRO with some exceptions. The distribution of stations with PAH exceedances was sporadic within the berth pockets and foreshore. Maximum concentrations of some PAHs in five of the 32 stations were higher than the 95th percentile of ambient sediment concentrations upstream and downstream of TMJ, measured by FRAMP. Therefore, additional analyses were conducted to predict the surface water concentrations of PAHs that could be remobilized from disturbed sediments during dredging. Based on the 95th percentile of measured sediment concentrations, predicted surface water concentrations of all PAHs were less than BC and CCME long-term WQGs and applicable guidelines protective of human health. The Application concluded that potential effects to aquatic and human health through this pathway would be negligible. The remobilization of metals, dioxins, furans and PAHs from disturbed sediments was, therefore, not carried forward as a residual effect.

Other Organic Constituents

The Application reported that concentrations of PCBs, VOCs and phenols in sediment from the dredge area were either less than the analytical detection limits or below applicable guidelines and objectives. This effect was, therefore, not carried forward as a residual effect.

RELEASE OF POLYCYCLIC AROMATIC HYDROCARBONS FROM CREOSOTE-TREATED PILES

The Application noted that during construction, PAHs could be temporarily suspended and transported in the water column if creosote-treated piles, their remnants, or surrounding sediment are removed or disturbed, as creosote is comprised mainly of PAHs. The Application predicted that the amount of PAH released would not be detectable due to the effectiveness of mitigation measures that would remove the piles intact and avoid bringing contaminated sediments to the surface.

RELEASE OF ALKALINE MATERIAL DURING CONCRETE WORKS

Concrete works and the removal of existing concrete near or in the water during construction could release cementitious material could negatively affect surface water quality. Similarly, the removal of concrete infrastructure during decommissioning could also release cementitious material. Construction materials containing cement, including concrete, are alkaline and can have adverse effects on aquatic life. The Application predicted that with the application of mitigation measures that would protect uncured concrete from contact with surrounding water, the release of alkaline material into the water would be negligible. This effect was, therefore, not carried forward as a residual effect.

ACCIDENTAL RELEASE OF DELETERIOUS SUBSTANCES

Accidents and malfunctions have the potential to occur during all phases of TMJ and cause an unintentional release of deleterious substances into the environment that have the potential to adversely affect fish and fish habitat quality and function. The potential effects of accidents and malfunctions are assessed in the Accidents and Malfunctions chapter (Section 9) of this Report. This effect was, therefore, not considered further in this Report.

BUNKER VESSEL SCENARIO

TJLP considered the interaction between vessel movement and Water Quality in the Application, and TJLP predicted negligible residual effects due to vessel scour as a result of vessel movement or berthing. TJLP reviewed the potential effects from the increased bunker vessel traffic on scour (see Section 5.3.3) and did not predict changes in residual effects or characterization of effects to River Processes from what was presented in the Application. TJLP concluded that the increase in annual bunker vessels is predicted to result in a negligible effect on Water Quality and the residual effects assessment in the Application is expected to remain unchanged.

5.5.2.3 MITIGATION MEASURES PROPOSED IN THE APPLICATION

The Application proposed the following measures to reduce the effects of TMJ on Water Quality:

- *Site Management, Erosion and Sediment Control Plan*: Measures to prevent erosion, sedimentation and effects to the aquatic environment;
- *Stormwater Management Plan*: Methods and design for stormwater and wastewater collection, treatment and discharge;
- *In-water works management plan*: Mitigations and water quality monitoring to reduce effects to water quality and aquatic life, including dredging mitigations;
- *Creosote Pile Removal Management Plan*: Creosote pile removal and storage mitigation measures;

- *Scour Protection Plan*: Positioning and maneuvering of vessels and barges in a manner to minimize re-suspension of riverbed sediments and avoid propeller scour;
- *Concrete Works Management Plan*: Measures to reduce the risk that concreate materials or leachate from concrete enter the water; and
- *Dredging Management Plan*: Water quality monitoring and dredging practices to ensure dredging practices minimize effects to the aquatic environment.

No additional mitigation measures were proposed by TJLP as part of the BVSA.

5.5.3 POTENTIAL PROJECT EFFECTS AND PROPOSED MITIGATIONS IDENTIFIED DURING APPLICATION REVIEW

The following key issues related to the assessment of Water Quality for TMJ were identified during Application review and based on feedback from the Working Group:

- Total suspended solids;
- Sediment sampling; and
- Discharge from vessels.

TOTAL SUSPENDED SOLIDS

ECCC and Tsawwassen First Nation raised questions about predicted levels of TSS due to dredging and the TJLP's proposed dredge management plan. They raised concerns about the temporal nature of TSS levels in the Fraser River and whether the dredge may increase TSS levels for longer periods or at different times of the year (e.g., outside of high flow conditions) and thereby bring them outside the range of existing variability and have adverse effects to aquatic life. ECCC also questioned the levels to which the dredge management plan would limit TSS to water quality guidelines or levels predicted in the Application.

> TJLP responded that ambient water quality guidelines and Fraser River specific water quality objectives would be used in the dredge management plan as triggers for implementing mitigation measures, which would be commensurate with the level of risk associated with a given parameter or magnitude/ duration of guideline exceedance.
>
> TJLP explained that the first response to an exceedance would be collection of confirmatory measurements after a specified period of time, followed by adjustments to the dredging activity if needed, up to and including stopping work. TJLP explained that the Application contained a prediction of the existing variability in TSS under existing conditions and the uncertainty in predicting effects to TSS from capital dredging under a range of river concentrations. TJLP also committed to undertake capital dredging during the least risk window specified by DFO for the lower Fraser River. TJLP considered the Application's TSS predictions to be conservative for a variety of reasons, including that

the ambient river TSS measurements that the predictions were compared to were taken at the surface of the water and close to shore (as opposed to closer to the sediment) and the assessed levels did not consider the mitigation measures proposed via the dredge management plan (see above mitigation section).

The EAO is proposing Condition 12: Water Quality Management Plan and recommending KMMs under CEAA 2012 for In-water Works, to manage potential effects to TSS during construction and operations during in-water works. In-water works mitigation includes real-time turbidity monitoring of background and TMJ-related releases and comparison against B.C. Water Quality Guidelines. If turbidity levels exceed these guidelines, pre-determined decision criteria with specific management actions would be followed. The EAO is also proposing Condition 10: Construction Environmental Management Plan and Condition 11: Operations Environmental Management Plan, and recommending KMMs under CEAA 2012 for Erosion and Sediment Control and Scour Protection.

SEDIMENT SAMPLING

ECCC and Tsawwassen First Nation expressed concerns that the sediment sampling and screening conducted for the Application did not fully characterize the sediment volume that would be dredged or adequately represent the deepest areas. ECCC explained that this hindered them from commenting on the suitability of the dredgeate for re-use or disposal at sea, and on the effects of dredging on sediment quality and its associated potential effect on aquatic receptors. ECCC was of the view that further sampling would benefit the disposal at sea application and Tsawwassen First Nation questioned why the samples were not screened against DAS Regulations if disposal at sea was being considered as an option for dredgeate disposal. Tsawwassen First Nation noted that although metals and organic contaminants were within the 95th percentile of measured concentrations, they still posed a risk to aquatic and terrestrial organisms. Tsawwassen First Nation requested additional analysis be conducted prior to sediment being used for restoration or disposal at sea.

TJLP explained that the approach area is comprised of unconsolidated sand that is subject to high river flows and scouring and that sediments in this dynamic environment are subject to continual disturbance. TJLP submitted a supplemental memo[51] to support the assertion that sediment previously sampled is representative of the subsurface materials in the dredge pocket. This memo explained that deeper layers of the area are primarily geologic material unaffected by human interaction. TJLP noted that sampling

[51] TJLP's response to ECCC's comments , dated February 26, 2020 (https://www.projects.eao.gov.bc.ca/api/public/document/60a49719148b4a0023306131/download/20200226_EAC_ECCC-41%2C42_WQ.pdf).

within the approach area showed low levels of organic matter, which would typically have relatively low concentrations of metals and PCBs.

Concerning disposal at sea, TJLP noted that the sediment characterization was designed to meet the requirements of the EA Application and the future ECCC requirements for disposal at sea permitting. TJLP noted that the specific screening against the DAS Regulations pursuant to the *Canadian Environmental Protection Act* would be reported in a technical report to be included in a potential DAS Application. An initial comparison to current disposal at sea limits found that a majority of the material would be suitable for disposal at sea.

The EAO has considered the information presented regarding sediment sampling for the purposes of the EA and notes that Tsawwassen First Nation advised that TJLP's rationale regarding sufficiency of sampling is adequate for the EA. The EAO notes that TJLP is contemplating disposal at sea for portions of the dredgeate and has conducted additional sediment sampling pursuant to ECCC's disposal at sea permitting requirements. The disposal at sea process would also involve screening of sediment against disposal at sea regulatory standards. The EAO is satisfied that this issue has been satisfactorily addressed for the purposes of the EA.

DISCHARGES FROM VESSELS

During the review of TJLP's BVSA Report, ECCC raised concerns about direct discharges from ships (e.g., bilge water and scrubber effluent), and that the total volume of these discharges could be larger with increased frequency of bunker vessel traffic under the BVS and could affect water quality and related VCs (e.g., fish and fish habitat and marine mammals).

TJLP noted that discharge of scrubber effluent within the LAA is regulated by the VFPA, and that VFPA's Port Information Guide includes restrictions around the discharge of scrubber wash water at the Port of Vancouver and details on how VFPA regulates exhaust gas cleaning system wash water. In addition the VFPA have identified plans to implement further restrictions at the Port of Vancouver, including prohibiting the discharge of scrubber wash water and eventually prohibiting the use of scrubber systems. Given the restrictions around discharge of scrubber effluent, and that the majority of vessels transiting to TMJ would either be LNG-powered or not require scrubbers, TJLP anticipates that potential effects on water quality and related VCs as a result of bilge water and scrubber effluent discharge would be negligible.

TJLP noted that prevention of oily bilge water discharge would include containment of onboard oil spills and leaks, and the collection and storage of the bilge water for treatment either onboard or at a receiving facility at port. Accidental discharge would require the oil spill to escape both spill containment and the bilge water collection/treatment system, which is very unlikely. Therefore, TMJ-related bilge water

discharges are not expected to release contaminants into marine waters that would adversely affect marine and estuarine water quality within the RAA. As such, an increased vessel traffic associated with the BVS is not anticipated to result in an increase in the direct discharge of bilge water from vessels calling to TMJ, and therefore no additional effects on water quality and related VCs are anticipated.

The EAO notes that potential effects from scrubber effluent and bilge water discharge would be sufficiently managed through adherence to the VFPA's Port Information Guide, federal regulations (*Canada Shipping Act*, 2001) and international conventions (for example, the MARPOL Convention).

5.5.4 THE EAO'S ANALYSIS AND CONCLUSIONS

This section presents the EAO's conclusions on the potential adverse residual effects from TMJ on:

- The Water Quality VC; and
- CEAA 2012 Section 5(1)(a)(i): This section of CEAA 2012 requires an assessment of fish and fish habitat as changes to water quality may affect fish and fish habitat.

Proposed Provincial Conditions and Key Mitigation Measures (CEAA 2012)

Based on the mitigation measures proposed in the Application and issues raised during Application review, the EAO proposes the following provincial conditions and KMMs under CEAA 2012:

- Condition 12: Water Quality Management Plan (provincial condition) and In-water Works mitigations (KMM) to reduce TSS from in-water works; and
- Condition 10: Construction Environmental Management Plan and Condition 11: Operations Environmental Management Plan (provincial conditions), as well as Erosion and Sediment Control and Scour Protection Mitigations (KMM) with best management practices to mitigate effects to TSS.

Residual Effects: After considering the proposed mitigation measures, the EAO concludes that TMJ would result in the following residual adverse effects to the Water Quality VC from the Application scenario and BVS:

- Increased suspended sediment due to dredging. In the absence of mitigation, dredging during construction is predicted to result in TSS levels of 14-54 mg/L, which would be up to 8-15 mg/L above baseline levels of TSS (navigational dredge levels). With the application of mitigation measures, this effect is expected to be less than the unmitigated predictions; however, a precise prediction of effects post-mitigation is not

possible due to the variability in baseline conditions and the dynamic nature of dredging effects and mitigations.

The EAO's characterization of the expected residual effects of TMJ on Water Quality and level of confidence in the effects determination (including likelihood and significance) are summarized below:

Table 13: Summary of Residual Effects to Water Quality – Increased TSS

Criteria	Assessment Rating	Rationale
Context	Moderate resilience	Levels of TSS and turbidity in the Fraser River, including the Gravesend Reach, vary seasonably. Levels are affected primarily by river discharge and tidal forces. Seasonal flow conditions are highly dynamic.
Magnitude	Low	In the absence of mitigation, dredging during construction is predicted to increase TSS by 8-15 mg/L beyond baseline, which would result in total levels of TSS ranging from 14-54 mg/L. With mitigation measures, this effect is expected to be less than the unmitigated prediction, but the precise level is uncertain. Even without mitigation, the increases to suspended sediments from dredging would be within existing variation (3.4-218 mg/L) of the Fraser River under the flow conditions expected during dredging.
Extent	Local	Suspended sediment would be localized to the area of riverbed disturbance in the LAA
Duration	Short term	Predicted effects in increased suspended sediments from dredging would be short term, only during the time necessary to dredge (approximately 50 days for capital dredging and 13 days for maintenance dredging).
Reversibility	Reversible	Effects would be reversible, once dredging ceases.
Frequency	Frequent	Increases to suspended sediments would occur annually during maintenance dredging (operations) and disturbances from propeller wash would occur during vessel operations (operations), in particular LNG carrier operations. Capital dredging would be limited to construction.
Likelihood	There is a high likelihood of increases in the amount of suspended sediments in the water.	
Significance Determination	In consideration of the low magnitude of effects, local extent, short-term duration, reversible nature of effects, and the proposed provincial conditions and recommended KMM including: Water Quality Management Plan and In-Water Works Mitigations to reduce TSS from in water works; Construction and Operational Environmental Management Plans; Erosion and Sediment Control Mitigations; and Scour Protection Mitigations with best management practices to mitigate effects to TSS, the EAO concludes that increased TSS would not have a significant adverse effect on water quality.	
Confidence	The likelihood rating for residual effects is determined with high confidence. Based on the proposed mitigation measures, industry best management practices, and compliance with the proposed EAC conditions, recommended KMMs under CEAA 2012, federal and provincial guidelines and permitting requirements, there is high confidence in the residual effects assessment.	

Note: Criteria and assessment ratings are defined in Appendix 5: Residual Effects Characterization Definitions.

5.5.5 CUMULATIVE EFFECTS ASSESSMENT

The EAO concluded that there would be residual effects from TMJ to water quality from increases to TSS which could occur in the LAA from dredge operations and propeller wash. Although the EAO did not predict residual effects to other water quality parameters, the EAO heard concerns from Tsleil-Waututh Nation about the overall, baseline water quality conditions of the Fraser River.

Cumulative effects on water quality could occur if there is the potential a spatial and/ or temporal overlap of past, present and reasonably foreseeable projects that could interact cumulatively with TMJ to affect TSS. The EAO considered the following reasonably foreseeable future projects and activities:

- VAFFC (1.3 km downstream);
- Vancouver Fraser Port Authority Fraser River Annual Dredging Program;
- Seaspan Ferries Tilbury Terminal Expansion (adjacent);
- Fortis Tilbury Phase 2 LNG Plant Expansion Project (adjacent); and
- Delta Grinding Facility (adjacent).

The EAO notes that the predicted effects to TSS from the navigational dredging program have been incorporated into the TMJ water quality predictions. The Fortis Tilbury LNG Plant Expansion would be an upland project, but construction materials could be brought in by water. The EAO conducted an EA of the VAFFC in 2012 and concluded that there would be residual effects to water quality, primarily through the project's dredging activities. Given that re-suspended TSS is expected to remain within the LAA it is unlikely that there would be a spatial and temporal overlap with increased TSS from VAFFC. The EAO does not have specific TSS predictions from the Seaspan Ferries Tilbury Terminal Expansion, Tilbury Phase 2 LNG Plant Expansion or Delta Grinding Facility projects. The two projects may increase TSS levels from dredging activities and/ or propeller wash as vessels berth and depart from Tilbury Island which may interact cumulatively with increased TSS from TMJ. The EAO notes that both Delta Grinding Facility and Tilbury Phase 2 LNG Plant Expansion Project are subject to EAs. Potential effects to the aquatic environment would be assessed under those processes.

The EAO is proposing Condition: 12 Water Quality Management Plan and recommending KMMs under CEAA 2012 for a water quality, to manage potential effects to TSS during construction and operations during in-water works (for example, dredging). The plan and KMMs would include TSS monitoring and management actions if TSS levels exceed B.C. water quality turbidity objectives. The EAO is confident that with the implementation of this monitoring and adaptive management, there would not be significant cumulative effects to the Water Quality VC.

5.5.6 CONCLUSIONS

Considering the above analysis and having regard to the conditions identified in the provincial TOC, including Condition 10: Construction Environmental Management Plan, Condition 11: Operations Environmental Management Plan and Condition 12: Water Quality Management Plan (which would become legally binding if an EAC is issued) and water quality mitigations recommended as KMMs under CEAA 2012 (Appendix 1) the EAO is satisfied that TMJ would not have significant adverse residual or cumulative effects on the Water Quality VC.

5.6 FISH AND FISH HABITAT

5.6.1 BACKGROUND

Fish and Fish Habitat was selected as a VC because the TMJ has the potential to have adverse effects to fish and fish habitat due to dredging, pile driving and vessel operations. Additionally, fish and fish habitat are important to Indigenous Groups and the public, and they are subject to a variety of policies and legislation.

The subcomponents and species for the Fish and Fish Habitat VC assessment were selected to represent differing presence at the TMJ site (seasonal anadromous fish versus year-round resident fish) and/ or species of conservation concern (Table 14).

Table 14: Subcomponents and Indicators for Fish and Fish Habitat VC

Subcomponents and species	Indicators
Original Application Area	
Anadromous Fish: chinook salmon, chum salmon, coho salmon, pink salmon, sockeye salmon, steelhead trout, and eulachon	• Fish habitat quality, including light and shading effects, and quantity; • Fish distribution – presence/ absence; • Fish abundance; • Harm – physical injury or mortality; and • Loss or degradation of habitat, for example, underwater sound, water quality and prey species availability.
Resident Fish: coastal cutthroat trout, bull trout, white sturgeon, demersal fish, for example, flat fish and sturgeon (including green sturgeon), and shallow nearshore forage fish, for example, sculpin, minnows and pike minnows.	
Benthic invertebrates	Benthic invertebrate abundance, diversity, and community composition.
Marine Shipping Assessment Area	
Pacific salmonids: see details above	• Wave height/ energy – Comparison of predicted TMJ-related wave height (m) to existing wave height (that is, overall change); and • Underwater noise – Comparison of predicted TMJ-related sound levels (decibels [dB]) to published tolerance thresholds.
Shellfish: Olympia oyster, northern abalone, Dungeness crab	
Forage fish: Pacific herring and eulachon	
Intertidal habitat: shorelines, estuaries, intertidal marsh; and macroalgae, eelgrass, biofilm	

The effects assessment of Fish and Fish Habitat is informed by the Noise (Section 6.2), Vegetation (Section 5.8) and Water Quality (Section 5.5) VCs, and the River Processes PC (Section 5.3). The results of the Fish and Fish Habitat assessment are incorporated into the EAO's assessment on effects to Marine Mammals (Section 5.7), Wildlife and Wildlife Habitat (Section 5.9) and Current Use of Lands and Resources for Traditional Purposes (Section 11.4).

For the EAO's assessment of potential effects of dredgeate disposal, including to Fish and Fish Habitat, refer to the Alternative Means of Undertaking the Project chapter (Section 2.2.5) of this Report.

5.6.1.1 REGULATORY CONTEXT

Fish and fish habitat protection and pollution prevention measures are contained within the federal *Fisheries Act,* including a prohibition against the harmful alteration, disruption or destruction (HADD) of fish habitat; the death of fish by means other than fishing; and a prohibition against the deposit of deleterious substances in water frequented by fish. The federal SARA prohibits killing, harming, capturing or harassing species listed (in Schedule 1 of the SARA) as endangered, threatened or extirpated and provides protection for habitat that supports these species. SARA 79(2) requires the identification of adverse effects of projects on the SARA listed species and their critical habitat and requires that measures be taken to avoid or lessen those effects and to monitor them. CEAA 2012 Section 5(1)(a)(i)) requires an assessment of environmental effects on fish and fish habitat as defined in subsection 2(1) of the *Fisheries Act*.

Other legislation, guidelines and advisory and scientific bodies relevant to fish and fish habitat for TMJ include the following:

- Committee on the Status of Endangered Wildlife in Canada (COSEWIC): an advisory panel that assesses and designates the conservation status of wildlife species at risk of extinction in Canada. Its assessment is considered during the SARA listing process;
- B.C. Conservation Data Centre (CDC): assesses the conservation status of vulnerable species and ecosystems and places them on red (extirpated, endangered or threatened) and blue (special concern) lists;
- B.C. *Wildlife Act* protects all native species of animals from direct harm, except as allowed by regulation; and
- Water quality guidelines: BC Approved Water Quality Guidelines for the Protection of Aquatic Life (2006) and Working Water Quality Guidelines for British Columbia (2017).

In terms of invasive aquatic species, regulations are in place regarding anti-fouling systems to mitigate the risk of introducing invasive aquatic species, such as the regular application of anti-fouling paint. TC has implemented the International Convention on the Control of Harmful Anti-fouling Systems on Ships (AFS Convention) through the Vessel Pollution and Dangerous

Chemicals Regulations which prohibits the use of harmful anti-fouling systems on ships (e.g. harmful substances used in anti-fouling paints) and Canada has supported the adoption of international guidelines for control and management of ships' biofouling[52].

5.6.1.2 BOUNDARIES

The LAA includes the aquatic and riparian areas of the TMJ site, including the nearshore and foreshore habitat associated with the footprint of the jetty and the dredge area, a 500 m buffer upstream of the site (to include government water quality monitoring stations) and a 100 m buffer downstream. The 500 m upstream buffer was established to consider potential water quality effects upstream of the TMJ site due to tidal influence. The RAA includes the South Arm of the Fraser River downstream of the TMJ site to Sand Heads and includes a 500 m buffer upstream of the site (including the monitoring stations noted above). The RAA includes the foreshore, sloughs and wildlife management areas of the South Arm of the Fraser River from the TMJ site's marine terminal to Sand Heads.

MARINE SHIPPING ASSESSMENT

The spatial boundary for marine fish in the MSA (marine fish MSA area) includes the inbound and outbound marine shipping lanes and surrounding marine habitat from the high-water mark from VFPA jurisdiction through the southern part of the Strait of Georgia, Boundary Passage, Haro Strait and west through Juan de Fuca Strait out to the 12 nm limit. The LAA and RAA are the same in the MSA area.

5.6.2 POTENTIAL PROJECT EFFECTS AND PROPOSED MITIGATIONS IN THE APPLICATION

5.6.2.1 BASELINE INFORMATION

The Application stated that the shoreline habitat along the TMJ site is a mix of less-developed high productivity habitat and moderate or low productivity habitat industrial areas. Existing fish and fish habitat conditions in the LAA and RAA were determined by TJLP through a combination of a literature review of existing background information and fish and benthic invertebrate surveys.

The portion of the Fraser River where TMJ would be located is used by both anadromous and resident fish. Salmonids would be present at the TMJ site during upstream adult migration in the fall and downstream juvenile migration and rearing in the spring to mid-summer. The

[52] Fisheries and Oceans Canada's Science Advice from The National Risk Assessment for Ballast Water Introductions of Aquatic Nonindigenous Species to Canada dated 2014. Available at: https://waves-vagues.dfo-mpo.gc.ca/Library/352514.pdf.

Application noted that overfishing, changing climatic conditions, and/ or habitat perturbations have contributed to the declines in chinook, coho and sockeye salmon and steelhead trout, some populations of which have been assessed as at risk by COSEWIC[53]. Eulachon (provincially blue-listed, assessed as endangered by COSEWIC, and currently in the final listing phase for SARA[54]) migrate through the area during upstream movements by adults and downstream dispersal of larvae, and is characterized currently as low suitability spawning habitat within the dredge area. The COSEWIC Assessment and Status Report technical summary of the Fraser River Eulachon population[55] lists the threats to populations and habitats as habitat damage from increasing industrialization in the lower Fraser River (rip rap and other obstacles) and the dredging of spawning areas as well as offshore interception and bycatch, poaching, possible extreme marine mammal predation, and sensitivity to climate change impacts on river discharges, temperatures, and flow rates.

White sturgeon (provincially red-listed, assessed as threatened by COSEWIC) are present in the area. Declines in white sturgeon may be the result of mortality from catch and release fisheries, by-catch in commercial and food, social and ceremonial (FSC) salmon fisheries, reduction in food availability, and continued habitat degradation[56]. Other threats identified as medium level risks include past in-river gravel extraction and shoreline modification[57]. The CDC indicates that there are three other fish species with a conservation status that may occur near the TMJ site: green sturgeon (provincially red-listed and listed under SARA as special concern), coastal cutthroat trout (provincially blue-listed) and bull trout (provincially blue-listed and listed under SARA as special concern). These three species were all represented by the resident fish VC subcomponent.

[53] Twelve populations of Fraser River Chinook Salmon have been assessed as at risk (7 endangered, 4 threatened and 1 special concern). Fifteen populations of Fraser River Sockeye Salmon have been assessed as at risk, (8 endangered, 2 threatened and 5 special concern). One population of Coho has been listed as threatened (Interior Fraser Coho). Two populations of Steelhead trout are endangered (Thompson River and Chilcotin River populations).

[54] The EAO notes that, if eulachon were listed under SARA, TJLP may require a *Species at Risk Act* Permit if TMJ has the potential to result in: 1) death, harm, harassment, capture or taking possession, collection, purchase, sale or trade an individual (or any part or derivative of such an individual) of an aquatic species at risk; 2) damage or destruction of the residence of an aquatic species at risk; and 3) the destruction of any part of the critical habitat of an aquatic species at risk.

[55] COSEWIC Assessment and Status Report on the Eulachon *Thaleichthys pacificus* in Canada (https://publications.gc.ca/collections/collection_2012/ec/CW69-14-638-2011-eng.pdf).

[56] COSEWIC Assessment and Status Report on the White Sturgeon *Acipenser transmontanus* in Canada (https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/cosewic/sr_esturgeon_blanc_white_sturgeon_1113_e.pdf)

[57] DFO. 2021. Recovery Potential Assessment for Lower Fraser River White Sturgeon 2020 (https://publications.gc.ca/collections/collection_2022/mpo-dfo/fs70-5/Fs70-5-2021-064-eng.pdf)

Indigenous Groups have noted the importance of the TMJ site for fish habitat, for example, Musqueam Indian Band confirmed that sturgeon use the area. Indigenous Groups highlighted that current fish populations are low compared to the recent past and that the Fraser River salmon species are declining in spawning population numbers and returning as smaller fish than previous years. Tsawwassen First Nation noted that over the last 100 years or more, the average spawning biomass of eulachon on the Fraser River declined from estimates of 1,000 tonnes to a historic low of only 10 tonnes in 2008. Since 2004, abundance estimates have shown that the total population of white sturgeon in the lower Fraser River has declined approximately 25 percent[58].

The Application included results from the literature characterizing benthic communities in the lower Fraser River. The results of a benthic survey characterized the area to be low in productivity, species diversity and abundance.

MARINE SHIPPING ASSESSMENT

As described in the Application, the marine fish MSA area is a highly productive marine habitat. The Salish Sea supports around 200 species of marine and anadromous fish and thousands of invertebrate species. Key species for fisheries include salmon, groundfish, pelagic fish (for example, Pacific herring and eulachon) and shellfish (for example, Dungeness crab, spot prawn, side-stripe shrimp, and many species of bivalves). The MSA reported 16 fish and invertebrate species are of conservation concern in the marine fish MSA area. The north extent of the marine fish MSA area includes the Fraser River estuary.

5.6.2.2 POTENTIAL PROJECT EFFECTS

This section provides a summary of potential effects identified in the Application and MSA to Fish and Fish Habitat during construction, operations and decommissioning of TMJ. The potential effects of vessel strikes was not considered in the Application; however, the potential effects of vessel strikes on sturgeon has been assessed by the EAO in Section 5.6.4 below.

WATER QUALITY

Increased suspended sediments can adversely affect habitat quality and function. The Application concluded that while TMJ might increase the suspended sediments in the Fraser River during all phases of TMJ in the LAA, changes are not expected to be distinguishable from existing conditions. The Application also predicted that levels of trace metals and organic constituents remobilized from disturbed sediments would be within the range of existing variability of the Fraser River. Refer to Water Quality (Section 5.5 of this Report) for the

[58] COSEWIC Assessment and Status Report on the Eulachon *Thaleichthys pacificus* in Canada (https://www.sararegistry.gc.ca/virtual_sara/files/cosewic/sr_eulachon_0911_eng.pdf).

assessment of water quality parameters from TMJ.

The potential effects of accidents and malfunctions to water quality, along with relevant mitigations and management plans, are discussed in the Accidents and Malfunctions chapter (Section 9) of this Report. For information on the assessment of potential effects of dredgeate disposal to Water Quality, please refer to the Alternative Means of Undertaking the Project (Section 2.2.5) in Part A of this Report.

INTRODUCTION OF INVASIVE SPECIES FROM BALLAST WATER EXCHANGE

The release of ballast water in the LAA and RAA could introduce invasive species into the Fraser River and marine environment during operations. Ballast water, which may contain fish and other aquatic organisms, is pumped into the tanks of vessels at their port of origin to provide stability to unladen ships. If ballast water is released at the destination port, these species may also be released and damage native species and habitat. TJLP would be required to follow operational requirements of the Ballast Water Regulations under the *Canada Shipping Act*, 2001, and TJLP noted that TMJ-related vessels would also follow additional ballast water management best practices, which it noted have been successfully employed by existing marine vessels. TJLP concluded that there would be a negligible likelihood of the introduction of invasive species from ballast water exchange.

SHADING EFFECTS

The Application noted that jetty infrastructure along the TMJ foreshore, and the presence of vessels at berth and those transiting to and from the TMJ site, could cause shading effects to fish and fish habitat. TJLP noted that the trestle gangway is proposed to allow light to pass through. Shading could affect fish behaviour by disrupting fish vision or migratory path, or by decreasing prey and habitat availability, and decrease habitat for fish and benthic invertebrates through the loss of vegetation. Approximately 0.11 ha during construction and 0.66 ha during operations would be affected by shading. TJLP concluded that the area that would be potentially affected by shading effects is already disturbed from the previous industrial activities and there would be no measurable loss of aquatic vegetation. The Application did not predict a measurable loss of habitat during operations due to shading effects from vessel movements because of the transient nature of these effects.

WAKE AND PROP-WASH

The Application noted that in-water works, berthing and departure of vessels and dredging may result in wake and prop-wash could potentially affect foreshore habitat. TJLP predicted that degradation of fish habitat quality and function from prop-wash would be limited by the installation of scour protection and restoration of the foreshore. Further, mitigation measures such as the use of tug boats for maneuvering LNG vessels would manage prop-wash. Given the implementation of these mitigation measures and the boat traffic that already exists in the

Fraser River, TJLP concluded that changes to habitat quality and function due to the increased wake and prop-wash from TMJ-related vessels were predicted to be undetectable. For further details on this effect, see River Processes (Section 5.3 of this Report).

HABITAT LOSS AND ALTERATION

The Application predicted that direct habitat loss would occur from the construction of offshore facilities, dredging, in river ground stabilization, pile driving, and installation of scour protection. During construction, an area of around 22 ha would be affected by dredging for both the temporary berth and jetty. In the dredge area, there would be scour protection along the dredge pocket slopes (concrete matting or other material) and ground stabilization areas needed to support the installation of TMJ infrastructure. An area of 0.017 ha would be lost due to the placement of piles from the permanent jetty and FTBB. The Application proposed a fish habitat offset plan for unavoidable effects to fish habitat from the TMJ footprint. Construction could also affect 0.23 ha in the estuarine marsh and riparian area. The Application noted that much of this area has been disturbed and altered by past industrial activities and invasive plant species. The Application explained that habitat would be restored and enhanced by TJLP and comparable ecosystem functions developed following construction.

During operations, annual maintenance dredging at the jetty site is proposed to ensure that river sediments do not build up and impede TMJ-related vessels from safely berthing. Dredging would remove the biologically active layer of sediments that provide living habitat for benthic invertebrates and foraging habitat for animals that feed upon them, but TJLP predicted that the dredged area would be re-colonized with benthic invertebrates after the re-establishment of a stable sediment layer within a few months.

UNDERWATER NOISE AND VIBRATION

During all phases of TMJ, underwater noise from activities like dredging, pile driving, and vessel operations can cause a range of effects on fish, from behavioural changes (for example, avoidance) to interference in fish navigation and even immediate or delayed mortality. Based on unmitigated underwater noise levels near the source for activities during construction and operations, the Application predicted a range of TMJ activities would result in underwater noise that would exceed the US National Marine Fisheries Service behavioural effect threshold of 150 decibels (dB)[59],[60] including dredging, vibrodensification (to install stone columns for ground improvement), vessel operations and pile driving. The Application predicted that none of these

[59] Behavioural disturbance thresholds were developed for pile driving but have been applied to all underwater activities in the absence of other available guidelines.

[60] Measured in dB re 1 µPa SPL_{rms} (average root mean square pressure level over a stated time interval).

activities would exceed the 206 dB[61] injury threshold except for pile driving, which would exceed the injury threshold for fish near the noise source (10-100 m from the noise source, depending on the size of the pile). TJLP acknowledged that the underwater noise modeling did not account for bathymetry or land features in the TMJ area which would affect underwater sound propagation and noted that there are islands in both directions of the Fraser River from the TMJ site that would limit the distance that sound would travel.

BUNKER VESSEL SCENARIO

For fish habitat quality and function, TJLP concluded that the BVS would not change the conclusions for shading effects, increased suspended sediments or introduction of invasive species from ballast water or change effects to foreshore habitat. TJLP considered TMJ-related residual effects due to underwater noise to be negligible, noting that self-propelled, LNG-powered bunker vessels are anticipated to be modern and designed to incorporate emerging technologies considering underwater radiated noise. TJLP acknowledged that some displacement by fish may occur as bunker vessels and LNG carriers travel to the TMJ. While additional bunker vessels are anticipated to transit to the TMJ under the BVS, TJLP predicted the disturbance footprint for fish from bunker vessels to be substantially less than that produced by LNG carriers (e.g., 12 m for bunker vessels vs. 108 m for LNG carriers). TJLP noted that while vessels may displace fish, the distance a fish may be displaced by a bunker vessel is substantially less than an LNG carrier and is relatively small in a system as large as the Fraser River.

In the BVSA, TJLP assessed the increased risk of fish injury or mortality in the LAA and RAA due to increased bunker vessel traffic. In the BVS, there would be fewer LNG carriers calls and an increase in bunkering vessel calls, of which self-propelled bunker vessels are anticipated to have propellers above the bottom of the vessel and ATBs are anticipated to have shrouded propellers (i.e., the propeller is fitted within a duct or nozzle). Compared to LNG carriers, bunker vessels reduce the amount of time propellers would spend rotating near the bottom of the dredge pocket or near the riverbed within navigation channels. With a shallower draft, TJLP concluded that bunker vessels are not anticipated to interact with sturgeon on the riverbed within navigational channels but may interact with sturgeon present within the mid-water column and at the surface. TJLP stated that an increase in TMJ-related bunker vessel transits may increase the risk of vessel strikes on sturgeon; however, this effect is not predicted to result in population level changes. In the BVSA, TJLP concluded that the residual effect was considered not significant considering the proposed provincial and federal conditions.

[61] Underwater sound levels are expressed in decibels, which is a logarithmic ratio relative to a fixed reference pressure of 1 micropascal (dB re 1 µPa).

POTENTIAL EFFECTS FROM SHIPPING IN THE MSA

TMJ would increase vessel movements by approximately 236 per year in the marine fish MSA area. The Application explained that noise generated by a vessel is relative to factors such as the size of the ship. The Application reported on acoustic modelling conducted for RBT2, which was based on a higher number of larger vessels, moving at faster speeds than TMJ vessels. This assessment found that the projected mean underwater noise levels from RBT2 vessels, in addition to other existing and future projects, would be between 118-122 dB in the marine fish MSA Area. Which represents a 0.06 to 0.08 dB increase from existing conditions and is below the threshold of behavioural effects. The modelling also indicated that behavioural responses of fish would be expected only in the immediate vicinity (less than 20 m) from the noise source (i.e., the vessel in transit).

The MSA concluded that, based on information about potential effects of underwater noise to fish and the modelling conducted for RBT2, the effects of underwater noise to forage fish (herring and eulachon) and salmonids would be negligible. The MSA stated that although there could be potential effects to marine invertebrates through physiological and behavioural mechanisms, measurable effects would be unlikely given information in the scientific literature that suggests any changes would be behavioural (for example, distraction) and short-lived.

The MSA explained that wakes from TMJ-related vessels would be small in comparison to the existing wave environment. It noted that most of the increase in waves would be near Vancouver Island in the vicinity of Discovery, Chatham, Chain and Trial islands. The MSA reported that this is an area of elevated levels of natural wave action and vessel wake waves would likely be small in comparison, and that TMJ's contribution to shoreline erosion would likely be unmeasurable.

5.6.2.3 MITIGATION MEASURES PROPOSED IN THE APPLICATION

The Application proposed mitigation measures to reduce the effects of TMJ on fish and fish habitat (Section 4.2.4.3 of the Application), including the following:

- *Site Management, Erosion and Sediment Control Plan*, which would include measures to prevent erosion, sedimentation and effects to the aquatic environment;
- *In-water Works Management Plan*, which would describe mitigation measures, including conducting in-water works during the DFO fisheries reduced-risk work window (16 July – 28 February) to the extent possible; however, in the event that in-water works extended beyond this window, TJLP would consider additional mitigations (this would done in a post-EA setting in consultation with Indigenous groups and DFO, to protect fish during sensitive life stages); the implementation of underwater noise mitigation, as well as water quality monitoring to reduce effects to water quality and aquatic life;
- *Fish Habitat Offset Plan,* to offset HADD of fish habitat due to TMJ footprint disturbance;

- *Dredging Management Plan*, which would include water quality monitoring and dredging practices to ensure dredging practices minimize effects to the aquatic environment;
- *Concrete Works Management Plan*, which would include measures to reduce the risk that concrete materials or leachate from concrete enter the water; and
- *Ballast Waste Management Plan* which would describe mitigations to ensure compliance with legislated shipping requirements related to ballast water.

No additional mitigation measures were proposed by TJLP as part of the BVSA.

5.6.3 POTENTIAL PROJECT EFFECTS AND PROPOSED MITIGATIONS IDENTIFIED DURING APPLICATION REVIEW

The following key issues related to the assessment of Fish and Fish Habitat for TMJ were identified during Application review and based on feedback from the Working Group:

- Residual and cumulative effects;
- Habitat offsetting;
- Underwater noise;
- White sturgeon;
- Eulachon;
- Salmon; and
- Effects of Shading

RESIDUAL AND CUMULATIVE EFFECTS

The Ministry of Forests, Lands and Natural Resource Operations (FLNRORD)[62], DFO, Musqueam Indian Band, Tsawwassen First Nation, and Kwantlen First Nation questioned TJLP's assertion that, following mitigation, TMJ would not have residual effects on fish and fish habitat. Concerns were raised about the extent to which the TMJ site has already been affected from past historical activities, the resiliency of species in the TMJ site area, and how these factors might affect predicted effects from TMJ. Indigenous Groups also raised concerns that cumulative effects on fish and fish habitat in the Fraser River were not adequately considered

[62] The EAO notes that as of April 1, 2022, the Ministry of Forests, Lands and Natural Resource Operations has been replaced by two new ministries: Ministry of Forests and Ministry of Land, Water and Resource Stewardship. References to FLNRORD are included in this Report, when referring to FLNRORD's participation as a Working Group member on the TMJ EA.

and expressed specific concerns about using current conditions as a baseline, and that current fish populations are at historic lows.

The EAO agrees that TMJ is likely to have residual effects on fish and fish habitat, that the TMJ site is in an area of the Fraser River affected by past and present industrial activities, and that many fish species under review are facing a variety of conservation risks across life stages and that, in some cases, recovery strategies and initiatives have been developed to arrest or reverse declines of certain fish species in the Fish and Fish Habitat MSA area (e.g., SARA listed species). The EAO assessed the incremental effects of TMJ based on current ecological conditions. The EAO does not assess the effect of a proposed project compared to a historic baseline (i.e., pre-industrial conditions), but notes that the effects of past activities are reflected in current conditions. The EAO considers species conservation status, population threats and trends, and known ecological thresholds in its conclusions on VCs.

The EAO acknowledges there is some uncertainty regarding how fish currently use the TMJ site, how this use might be affected by TMJ activities and the level of resiliency fish in the area have to these potential changes. The EAO captured uncertainty in the confidence rating in the conclusions below. The EAO has heard from Indigenous Groups that information gaps relating to sturgeon and eulachon are such that there can only be a low level of confidence that mitigation measures put forward to date would manage effects from TMJ to these at-risk species. The EAO recommends a KMM under CEAA 2012 for Fish Mitigations to Reduce Harm and Mortality, including conducting in-water works during reduced-risk work windows identified by DFO, unless authorized by DFO, conducting monitoring for fish presence prior to pile driving and dredging at any time of the year, and seasonal restrictions during operations on hydraulic suction and clamshell dredging to avoid entrainment of juveniles. Criteria and triggers to modify or stop in water works in response to fish presence or fish kill would be developed by a QP. The mitigations would be developed in consultation with DFO (through the application for *Fisheries Act* authorization process), Indigenous Groups and FLNRORD and would require incorporation of Indigenous knowledge. Further discussion of species-specific concerns for sturgeon, eulachon and salmon are discussed below.

HABITAT OFFSETTING

The Application proposed a habitat offset for the direct habitat loss associated with the TMJ footprint (i.e., the piles of the jetty). Tsleil-Waututh Nation, Tsawwassen First Nation, Musqueam Indian Band, FLNRORD and DFO provided comments on the proposal, which included the following requests: additional details on selection and function; broader scope of conceptual plan to include the whole dredge area; consultation with Indigenous Groups and inclusion of Indigenous Knowledge; that the offset area exceed the amount and quality of habitat loss and create a net gain in fish and invertebrate productivity; reflect lessons learned from other offset plans in the region; and that the proposed offset plan not be considered in

the EAO's residual effects conclusions due to uncertainty in effectiveness of the offset and potential temporal delay in functioning.

> TJLP committed to take into consideration the design and success of similar fish habitat offsetting conducted in the area and to design the offset to achieve an overall net gain of useable habitat. TJLP explained that follow-up environmental monitoring programs would be implemented to evaluate and confirm the effectiveness of the offset, including a multi-year monitoring program to measure diversity and abundance of fish and benthic invertebrates compared to similar habitats not affected by TMJ activities.

DFO has clarified that dredging and scour protection may result in a harmful alteration, disruption or destruction ("HADD") of fish habitat and would likely require authorization under the *Fisheries Act*. The scope of works that would require the authorization and habitat offsetting requirements would be determined during DFO's regulatory review process. DFO has noted that annual maintenance dredging may be able to follow DFO's code of practice for routine maintenance dredging (i.e., such that there would not need to be an authorization granted for each annual dredge)[63]. DFO has noted that based on the extent and nature of TMJ effects to fish and fish habitat, that it would be feasible for TJLP to develop a plan that is consistent with DFO's policy.

The EAO is recommending a KMM under CEAA 2012 for a Fish Habitat Offset Plan, to be developed in consultation with Indigenous Groups and LWRS, for offsetting effects to fish habitat from TMJ, to ensure offsetting habitat would provide a higher value than the fish habitat it is replacing. It would also include a monitoring program to assess the effectiveness of offsetting measures and describe contingency measures and associated monitoring measures that would be put into place if the offsetting measures are not successful. Contingency measures would be developed and implemented in consultation with Indigenous Groups, including roles for Indigenous participation in monitoring.

UNDERWATER NOISE

Musqueam Indian Band, Tsawwassen First Nation, Tsleil-Waututh Nation and Cowichan Nation Alliance noted concern for the potential effects on fish from underwater noise, such as from construction and marine shipping. Tsawwassen First Nation, Tsleil-Waututh Nation and Cowichan Nation Alliance requested that bubble curtains be used as a precautionary measure during all pile driving activities to reduce noise related injury and disturbance to fish and

[63] DFO's Interim code of practice for routine maintenance dredging, dated October 2020 (https://www.dfo-mpo.gc.ca/pnw-ppe/codes/dredge-drageur-eng.html). This code does not remove or replace the obligation for projects to comply with all applicable statutory and regulatory requirements of the *Fisheries Act*, or other federal, provincial, or municipal legislation and policies.

invertebrates. Tsawwassen First Nation has stated a precautionary approach needs to include consistent noise monitoring and the use of bubble curtains (and any other valid sound attenuation devices) during all pile driving activities, including during vibratory pile driving given noise exceedances have recently been experienced on other vibratory pile driving projects in the lower Fraser River. Tsawwassen First Nation deems a reactionary approach of adding sound attenuation devices only once an exceedance has occurred as unacceptable.
Tsawwassen First Nation noted that the lack of scientific data to support conclusions on effects of underwater noise on fish presented a notable concern and requested that TJLP conduct continuous monitoring via side scan sonar for large fish for all construction activities that cause underwater noise to reduce effects to species like sturgeon.

In terms of marine shipping, Musqueam Indian Band noted uncertainty about the potential effects of underwater noise and the disturbance thresholds upon which the MSA based its conclusions. Musqueam Indian Band recommended a precautionary approach be taken, as well as additional studies. Tsawwassen First Nation requested further information about research on vessel noise and acoustic thresholds, and effects on marine fish and invertebrates from repeated long-term exposure and on different life stages.

During the review of TJLP's BVSA Report, Tsawwassen First Nation identified uncertainty associated with TJLP's assumptions related to avoidance/displacement of fish in and around the smaller bunkering vessels, and Tsleil-Waututh Nation expressed that the effects from underwater noise to fish resulting in behavioural disturbances would be significant.

> TJLP responded that the literature suggests that fish would move away from mobile vessels due to noise and that there were no quantitative criteria for fish behaviour responses to sound. TJLP stated that there was limited research available that evaluated long term behavioural effects to fish from underwater noise or at different life stages. TJLP summarized information from studies that looked at long term noise effects on developing rainbow trout, crabs and invertebrate larvae at cumulative noise levels at or higher than those predicted in the MSA that concluded with no long-term negative effects on the health of the fish.
>
> With respect to the request for continuous side scan sonar, TJLP noted that once construction starts, noise would discourage fish from the area, and that continuous monitoring would not therefore be required. Additionally, TJLP explained that monitoring for fish presence during works is likely not feasible as vessels would need to operate proximal to the pile driving/ dredge vessels raising safety concerns. TJLP committed to monitoring prior to pile driving and dredging and to using sound attenuation devices during impact pile driving at all times and during vibratory pile driving if noise levels exceeded thresholds. TJLP noted that noise thresholds are typically set below the injury level so that mitigation is put in place before the critical level is exceeded.

The EAO notes that Tsawwassen First Nation and the Indigenous Groups noted above have ongoing concerns regarding potential effects to fish from underwater noise for the Application scenario and BVS. The EAO acknowledges that uncertainties exist regarding the nature and extent of behavioural effects of underwater noise on fish and there are no standard behavioural criteria or thresholds for this pathway of effect. Under the BVS, underwater noise levels are predicted to be consistent with levels already experienced in this section of the Fraser River from existing shipping traffic. While the BVS would result in an overall increase in the frequency of TMJ-related vessels in the LAA and RAA, and increased frequency of underwater noise disturbances, this increase would be temporary for vessels in transit and smaller bunker vessels are expected to produce lower underwater noise levels relative to LNG carriers. The EAO finds that, despite a lack of consensus on this point, for the purposes of the EA, the information on acoustic effects at the TMJ site, from the TMJ site to Sand Heads, and in the MSA has been sufficient to enable the EAO to conclude that underwater noise from vessel traffic associated with TMJ (for both the Application scenario and BVS) is within normal ranges of other marine activities, and effects to fish and fish habitat from TMJ-related vessel noise would not be measurable.

The EAO has heard from Indigenous Groups that, given the lack of data and knowledge regarding repeated, cumulative effects from vessel noise on all life stages of fish, they have low confidence in the EAO's conclusion of non-measurable effects to fish from TMJ-related vessel noise.

To mitigate underwater noise effects to fish from in-water works in the marine terminal area, the EAO is proposing KMMs under CEAA 2012 for Fish Mitigations to Reduce Harm and Mortality. The KMMs recommend underwater noise management mitigations, including use of vibratory pile driving as the primary driving method, use of impact pile driving only when vibratory pile driving is not technically feasible, and the use of sound attenuation devices (e.g., bubble curtains) or techniques (e.g., ramp up to build up noise slowly) during impact pile driving. The EAO notes Tsawwassen First Nation requested the use of sound attenuation devices during all pile driving activities, including vibratory pile driving. The KMMs recommend underwater noise management mitigations included underwater monitoring of sound levels to ensure that injury thresholds are not exceeded, and TJLP would be required to provide alternate mitigations in consultation with Indigenous Groups and DFO to ensure that the thresholds are not exceeded. Mitigations also include monitoring for fish presence prior to pile driving and dredging and requirements for criteria and triggers to modify or stop in water works in response to fish presence or fish kill during pile driving and dredging as determined by a QP. The EAO recognizes that the efficacy of mitigation measures such as bubble curtains depends on factors such as current speed (e.g., the performance of bubble curtains is inversely proportional to current speed) and equipment capabilities and performance.

STURGEON

Indigenous Groups and FLNRORD raised concerns about the vulnerability of sturgeon and potential effects of TMJ on sturgeon[64]. Kwantlen First Nation, Cowichan Nation Alliance, Ts'uubaa-asatx Nation, Tsawwassen First Nation and Musqueam Indian Band noted the cultural importance of sturgeon to their communities, and both Musqueam Indian Band and Tsawwassen First Nation have self-imposed moratoriums on sturgeon fishing. FLNRORD, Tsawwassen First Nation, Ts'uubaa-asatx Nation, and Musqueam Indian Band raised concerns about sturgeon being attracted into the dredge pocket, as they have a preference for deeper habitats, and that this could expose them to a higher risk of harm or mortality from interactions with TMJ-related machinery or vessels. Tsawwassen First Nation requested that TJLP limit dredging activities to the least risk window for sturgeon (December to February), and that TJLP review and consider additional literature available on juvenile and adult sturgeon and additional data on sturgeon usage and strikes in the area. While acknowledging a lack of proven monitoring and mitigation measures relating to their concerns, Tsawwassen First Nation also requested a commitment to using side scan sonar to determine sturgeon presence prior to construction and annual dredging (regardless of dredging timing) and assess how sturgeon use might be affected by increased vessel traffic within the dredge pocket. Tsawwassen First Nation posits that the monitoring results could confirm that the actual situation concerning risks to sturgeon is vastly different from the one concluded on in the EAO's assessment.

During the EA additional information and reports were submitted regarding sturgeon, including two supplemental reports[65] from TJLP that included tracking and vessel strike data from FLNRORD, and a literature review[66] from Tsawwassen First Nation that provided evidence that vessel movements and dredging can injure and kill sturgeon in riverine environments, such as the Fraser River. Tsawwassen First Nation emphasized that the cumulative effects of threats to sturgeon (including but not limited to habitat loss and degradation, dredging, gravel mining,

[64] White sturgeon are threatened under COSEWIC and green sturgeon are listed as special concern under SARA. Both are provincially red-listed. This section uses the term "sturgeon" generally because concerns about sturgeon included both species. Although the data, information and reports described in this section were focused on white sturgeon, white sturgeon are considered a suitable surrogate for green sturgeon at the TMJ site. This is because white sturgeon spend more of their life in the river (green sturgeon spend more time in the marine environment) and are considered more sensitive to project-related changes than green sturgeon. For this reason, mitigation measures proposed for white sturgeon are also likely protective of green sturgeon at the TMJ site. The EAO's analysis and conclusions in Section 5.7.4 also relate to both species.

[65] TJLP's Fish and Fish Habitat Supplemental Memos dated July 8, 2019 (https://www.projects.eao.gov.bc.ca/api/public/document/60a4856c148b4a0023306033/download/20190708_CNA_TFN_FLNRORD_Fish%20and%20Fish%20Habitat_Rev1.pdf) and May 28, 2020 (https://www.projects.eao.gov.bc.ca/api/public/document/60a4a0e9148b4a0023306183/download/20200528_Sturgeon%20Memo.pdf).

[66] Impacts of vessels on lower Fraser River White Sturgeon, dated November 2020, prepared for Tsawwassen First Nation by LGL Limited.

fisheries bycatch, and vessel strikes) are at best hindering population recovery and at worst causing a population decline and that this may preclude the ability of white sturgeon to provide a sustainable annual harvest by Tsawwassen First Nation fishers in the lower Fraser River. Currently, Tsawwassen First Nation members cannot exercise their treaty right to harvest sturgeon because of conservation concerns for the population. See Section 14.7 in Part C for more details on the effects of TMJ on Tsawwassen First Nation's Treaty rights.

During the BVS review, the EAO heard concerns from Indigenous Groups, including Tsleil-Waututh Nation, Ts'uubaa-asatx Nation (formerly Lake Cowichan First Nation), and Tsawwassen First Nation, about the increase in vessels from 137 annual calls at the jetty to up to 365 annual vessel calls and the increase in risk of vessel strikes. Tsawwassen First Nation noted uncertainty about the mechanism of strikes (e.g., whether related to depth of draft and/or hydraulic forces of the propeller "sucking in" sturgeon) and the interaction with fish size (e.g., juveniles are smaller and weaker swimmers and may be more prone to be drawn into contact with rotating propellers). FLNRORD also noted that sturgeon tend to be more active in the mid-water column during the summer and fall when sturgeon are known to feed near the surface. The EAO acknowledges there is some uncertainty the potential risk of harm or mortality due to vessels strikes, including the interaction with vessel class and fish size, and have captured uncertainty in the confidence rating in the conclusions below. TJLP acknowledged that under the BVS there would be an increase in the number of TMJ-related vessel transits, which may increase the risk for vessel strikes on sturgeon compared to the scenario presented in the Application. TJLP acknowledges that there is a lack of empirical evidence relating to the impacts of vessel strikes on sturgeon in the lower Fraser River, including sub-lethal impacts on reproductive success of sturgeon. Acoustic telemetry studies revealed that adult sturgeon tagged near and upstream of the Port Mann Bridge used the lower reaches of the Fraser River primarily between May and September. A literature review by the Port of Vancouver did not contain any references that identified the TMJ LAA or TMJ footprint as spawning or holding habitats. Accordingly, TJLP considers sturgeon use within the TMJ area to be either temporary or transient in nature during migration, and that staging habitat for adults or juveniles has not previously been identified. Although TJLP anticipates a temporary nature of sturgeon in the TMJ area, TJLP recognizes that habitat value within the dredge area may change as a result of TMJ-related dredging and, as a result, has committed to TMJ-specific mitigation designed to reduce the probability of harm from physical disturbance and vessel strikes. Tsawwassen First Nation questioned the veracity of TJLP's conclusions about sturgeon because some research has demonstrated that a proportion of the sturgeon population may be non-migratory – or at least do not undertake predictable, seasonal upstream/downstream movements. Tsawwassen First Nation cautioned that until such time as all age classes of sturgeon are tagged and studied near Tilbury Island it is untenable to conclude that the use of that area by sturgeon presently is wholly temporary or transient.

On arrival (i.e., nearly empty cargo tanks), the draft of the LNG carrier and depth of propeller are expected to be further from the bottom (i.e., where sturgeon are understood to dwell), the engine would run at minimum speed, and once secured at the jetty, the engine would be turned off and no propeller would be turning. In terms of propellers in the dredge pocket, TJLP explained that tugs are much shallower draft (4 to 5 m) and their propellers are shrouded. For the Application scenario, TJLP estimates that loaded LNG carriers would have propellers turning near the bottom of the dredge pocket approximately 51 hours a year (less than 0.6%) with tug and vessel noise in advance (e.g., slow start) that would likely cause sturgeon to leave if they are present. Once mooring lines are released, the tugs would maneuver the LNG carrier out of the dredge pocket and the main engines turned on in slow speed. Under the BVS, self-propelled bunker vessels are anticipated to have propellers above the bottom of the vessel and ATBs are anticipated to have shrouded propellers. Compared to LNG carriers, bunker vessels reduce the amount of time propellers would spend rotating near the bottom of the dredge pocket or near the riverbed within navigation channels.

TJLP committed to using side scan sonar prior to dredging at any time of the year, in addition to monitoring the dredge pocket for sturgeon occupancy. TJLP explained that their construction activities could not be conducted solely within the Ministry of Land, Water and Resource Stewardship (LWRS) least risk window for sturgeon as they will take longer than that. TJLP will aim to conduct annual dredging within the window but cannot commit to it for a number of operational reasons (e.g., variability in timing of sediment build up, availability of companies to conduct the dredging). Tsawwassen First Nation expressed outstanding concerns that the LWRS least risk window for sturgeon was not captured in the recommended KMMs under CEAA 2012. The EAO considered the feedback and determined that, at the EA phase, the EAO would not recommend adherence to the LWRS window as a KMM because there was not enough certainty that it would always be possible to stay within the LWRS window when conducting maintenance dredging. While this requirement has not been added, the recommended KMMs under CEAA 2012 require TJLP to provide IAAC and Indigenous Groups justification for why work must occur outside LWRS window for sturgeon prior to the start of work, and also identify and implement additional mitigation measures related to in-water works.

Snuneymuxw First Nation identified that the proposed mitigation measures for sturgeon seemed limited for mitigating potential impacts due to vessel strikes during operations. FLNRORD noted vessel strikes were not considered a main threat to sturgeon and that although population-level effects are unlikely, they agreed with Indigenous Groups that the loss of a large, sexually mature female would have a greater effect on the population than the loss of a juvenile, and there is limited information with respect to the interaction of sturgeon with vessels and dredge equipment.

In consideration of all the information provided and the concerns raised, the EAO recommends KMMs under CEAA 2012 for Fish Mitigations to Reduce Harm and Mortality. The EAO is

recommending that side scan sonar surveys of the dredge footprint be conducted immediately prior to the start or restart of pile driving and dredging to determine sturgeon presence and acoustic and vibratory fish deterrent measures (e.g., ramp up – gradual starting of machinery) to reduce risk or entrainment and harm. Additionally, the EAO is recommending that side scan sonar be required once the dredge pocket has been established to inform sturgeon occupancy mitigations. TJLP would also be required to record and report of any observations of sturgeon mortality or injury in the marine terminal area to Indigenous Groups. In the event of an observed sturgeon strike, TJLP would report the strike to DFO and Indigenous Groups, determine whether the operation of the TMJ played any role and if so, report to DFO and Indigenous Groups on whether further mitigation is appropriate. The EAO also recommends a follow-up program for effectiveness of fish and fish habitat mitigations as a KMM under CEAA 2012. The EAO is satisfied that it has sufficient information to conclude on the risks to sturgeon from TMJ (see Section 5.6.4). The EAO notes that Indigenous Nations have expressed that they do not agree that monitoring would generate sufficient information to conclude on risks to sturgeon from TMJ.

The EAO also notes that B.C. is committed to developing a provincial, basin-wide management plan for the Fraser River white sturgeon in collaboration with federal and First Nation governments. In July 2022, the Province issued a draft Terms of Reference for the B.C. Fraser River White Sturgeon Management Plan[67]

EULACHON

Tsawwassen First Nation, Musqueam Indian Band and Ts'uubaa-asatx Nation (formerly Lake Cowichan First Nation) raised concerns that eulachon may spawn in the lower Fraser River and around the TMJ site and noted the high cultural importance of eulachon to their communities. Musqueam Indian Band identified eulachon as an integral part of Musqueam life, language and culture. Tsawwassen First Nation has informed the EAO that eulachon are a cultural keystone species supporting Tsawwassen First Nation with food, social, ceremonial, and ecological values. Tsawwassen First Nation noted that Indigenous knowledge should have been used to inform an understanding of baseline conditions and requested a eulachon egg mat study be conducted to determine if the TMJ site provides spawning habitat. DFO and Tsawwassen First Nation noted that egg incubation is not confined to a spawning site. Musqueam Indian Band's noted the importance of protecting not only preferred eulachon spawning habitat but also to maintain secondary habitat and/or marginal eulachon spawning areas that could become more viable and used for eulachon spawning at times in the future

[67] For more information, refer to https://www2.gov.bc.ca/assets/gov/environment/plants-animals-and-ecosystems/fish-fish-habitat/fishery-resources/fraser-river-white-sturgeon/terms_of_reference_frasersturgeonmanagementplantor_29sep2022.pdf

when eulachon are more abundant in the Fraser River than current historically low population levels, and noted concerns with effects on juvenile and larval eulachon. Musqueam Indian Band noted that the EAO should include Musqueam's assessment of the potential suitability of the area for future eulachon spawning, which is based on Musqueam traditional ecological knowledge. Ts'uubaa-asatx Nation (formerly Lake Cowichan First Nation) identified concerns regarding the proposed monitoring approaches may be insufficient for eulachon (and juvenile sturgeon), that eulachon may be present in the river in December and requested that TJLP consider use of an aquatic zooplankton and fish profiler. Tsawwassen First Nation was of the view that the full effects of TMJ on eulachon were not assessed through various pathways (e.g., prop-wash and noise). Tsawwassen First Nation noted that that there is uncertainty of the potential effects of TMJ on eulachon, which could be addressed with further studies. Tsawwassen First Nation stated that, similar to sturgeon monitoring, monitoring would generate results that could confirm that the actual situation concerning risks to eulachon is vastly different from the one concluded in the EAO's assessment. During the BVS review, the EAO heard from Indigenous Groups that the are concerned that additional bunker vessel traffic would affect eulachon recruitment.

In response to the concerns raised, TJLP completed additional eulachon spawning habitat characterization and spawning assessment studies to address uncertainty in the potential for eulachon spawning habitat within the proposed dredge area. TJLP provided a memo[68] summarizing the available literature and presenting data from additional habitat characterization work conducted in the spring 2020, and a report[69] summarizing the results of an in-river eulachon spawning assessment conducted during the 2021 spawning season (egg mat study). The assessment was conducted in collaboration with Tsawwassen First Nation and Musqueam Indian Band to assess for the presence of eulachon spawning in the dredge area and documented a total of 16 eggs during the 45-day monitoring period. TJLP explained that given eulachon are broadcast spawners, the low number of eggs collected during the 2021 spawning assessment suggested that eulachon are not likely spawning in the proposed dredge area. Also, the eggs captured were not found adhered to the mat, suggesting that the eggs likely drifted into the dredge area, originating from spawning events that occurred outside of the assessment area. Based on the physical and biological information collected, TJLP concluded that habitat within the dredge area is low suitability spawning habitat due to the combination of the tidal salt wedge, lack of suitable spawning substrate, elevated flow

[68] TJLP Eulachon Spawning Habitat Characterization, dated June 11, 2020 (https://www.projects.eao.gov.bc.ca/api/public/document/60a556a1148b4a0023306fd2/download/20200611_Eulachon_Spawning_Habitat_Characterization.pdf).

[69] TJLP's 2021 Eulachon Spawning Assessment Report, dated June 23, 2021 (20210623_2021 Eulachon Spawning Assessment Report.pdf).

velocities that can occur during the spawning period, and lack of direct evidence of spawning. Further, TJLP concluded that current usage of the dredge area by adult eulachon is temporary and largely limited to the period of migration movements to upstream spawning locations. TJLP considered current TMJ site usage by eulachon to be temporary during the larval stage. After eggs have hatched, TJLP acknowledge that planktonic larvae may spend a portion of their time travelling through the TMJ area on their way downstream to the ocean with river currents.

Tsawwassen First Nation's disagreed with TJLP's conclusions that the site is unlikely to support eulachon spawning due to unsuitable bottom substrate, water velocities and salinity given the lack of empirical data and available information. Tsawwassen First Nation expressed their methodological concerns with the habitat characterization work from Spring 2020 and believe that uncertainty still remains and that additional field work (i.e., a total of four years of baseline data on eulachon spawning) is necessary to know if the site could support eulachon spawning and/ or early rearing. Tsawwassen First Nation has also identified a need to understand the importance of the area for migrating adult eulachon and the potential implications of dredging impacts on them.

DFO commented that it does not appear that habitat loss is a limiting factor causing widespread population declines for eulachon at this time[70]. They also noted that there is no evidence that available spawning habitat within the Fraser River has been reduced to the extent that it would limit population increases from the present low levels, although noted that as eulachon populations recovered there may be instances where habitat loss could inhibit or slow further recovery.

The EAO understands that TJLP is collaborating with Tsawwassen First Nation on a eulachon spawning assessment in 2022-23 which would aim to identify more suitable spawning habitat in the lower Fraser River, over a wider geographic area upstream of the TMJ site. The study would involve three phases: desktop assessment, habitat assessment, and spawning use assessment.

The EAO has considered the existing uncertainty in its conclusions below, including the importance of the area as eulachon habitat and the degree to which dredging would alter habitat over the long-term, and proposed mitigations described in the above sections, most of which would also benefit eulachon. As part of the recommended KMMs under CEAA 2012, the follow up program for effectiveness of fish and fish habitat mitigations, would be expected to reduce this uncertainty and would include an adaptive management component to mitigate effects. The EAO is satisfied that it has sufficient information to conclude on the potential effects to eulachon from TMJ. The EAO is aware that TJLP has committed to contribute up to $2

[70] Fisheries and Oceans Canada Recovery Potential Assessment of Eulachon (*Thaleichthys pacificus*) in Canada, dated 2012 (https://waves-vagues.dfo-mpo.gc.ca/Library/347894.pdf).

million to the First Nations Fisheries Legacy Fund (FNFLF)[71], which is a program led by several Indigenous Groups that supports recovery programs for chinook salmon, eulachon and sturgeon in the Fraser River and Salish Sea. The EAO shared the proposal with the Working Group and understand that TJLP has conveyed this commitment to members of the FNFLF.

SALMON

Tsleil-Waututh Nation, Malahat Nation, Musqueam Indian Band and Tsawwassen First Nation raised concerns about the effects of TMJ on salmon, including the potential for TMJ to adversely affect habitat for juvenile and migrating salmon via increased vessel traffic in the TMJ site area and TSS. DFO noted that the TMJ area is in an estuary environment used by salmon for rearing and to adapt to saltwater and that TMJ might change the function of the habitat to some degree. Musqueam Indian Band noted that they are actively working to protect and restore salmon habitat in an effort to begin to restore salmon populations to their traditional levels from the historic lows of recent years. In this context, Musqueam Indian Band is concerned about the effects TMJ would have on both current salmon abundance, but also efforts to increase populations. Tsawwassen First Nation also raised concerns that the sockeye salmon run in 2022, being one of the expected peak years, was lower than expected in the Fraser River (the pre-season estimates of 9.8 million was reduced to 5.5 million in August 2022). The run in the lower Fraser River was low in contrast to the high returns experienced in other river systems on the B.C. coast.

> TJLP noted that the primary risks to salmonids are understood to be factors such as over-fishing, loss of spawning habitat and climatic factors, none of which would be exacerbated by the TMJ. TJLP predicted that the incremental changes to habitat quality and function at the TMJ site resulting from two or three additional vessels per week associated with TMJ would be undetectable. TJLP noted that Fraser River out-migrating salmon fry tend to remain close to the shoreline and typically inhabit the shallow waters of the Fraser River's tidal marshes. To offset habitat loss, TJLP proposed that the shoreline within the LAA would be restored and enhanced from its currently altered state and would be designed to address the existing level of vessel activity, and as such, is not expected to be adversely affected by incremental vessel activity associated with TMJ. TJLP also noted that TSS levels predicted from TMJ are an order of magnitude lower than those reported to be lethal to fish and also lower than those resulting during naturally occurring high-flow conditions.

[71] TJLP's proposal for Unconventional Offsetting Accommodation for Residual Project and Cumulative Effects, dated July 5, 2021 (https://www.projects.eao.gov.bc.ca/api/document/61099898cd98620022b0832b/fetch/20210707_TilburyJettyLimitedPartnership_UnconventionalOffsetProposal.pdf).

The EAO notes that Tsawwassen First Nation and the Indigenous Groups noted above have ongoing concerns about salmon conservation in the lower Fraser River and Salish Sea. The EAO notes the importance of salmon and the conservation status, however, the EAO is of the view that, considering the extent of potential effects and with the implementation of the proposed mitigation measures, potential effects on salmon from TMJ can be adequately addressed. Please see the various proposed KMMs under CEAA 2012 described in Section 5.6.3, many of which would also benefit salmon. Potential effects on salmon are considered as part of the analysis of residual effects on habitat and noise below.

EFFECTS OF SHADING

During the review of TJLP's BVSA Report, Tsawwassen First Nation identified there was a lack of evidence to conclude no changes to fish habitat from shading. Tsawwassen First Nation pointed to the increased bunker vessel traffic with the BVS, and that the increased amount of time that the jetty area would be shaded could affect aquatic vegetation and, as a result, fish habitat.

> TJLP assessed the potential for TMJ-related shading effects on fish and fish habitat for the Application scenario and concluded that there were no predicted changes in TMJ shading due to the increase in bunker vessels under the BVS. This determination is predominantly due to the lack of vegetation within dredge pocket.

The EAO agrees with TJLP, that there are no predicted changes in TMJ shading due to increase in bunker vessels, primarily because there is a lack of vegetation within dredge pocket, and the effectiveness of the proposed Project design measures, such as using grating in the trestle structure to allow for light penetration.

5.6.4 THE EAO'S ANALYSIS AND CONCLUSIONS ON EFFECTS TO FISH AND FISH HABITAT

This section presents the EAO's conclusions on the potential adverse residual effects from TMJ on:

- The Fish and Fish Habitat VC;
- CEAA 2012 5(1)(a)(i): fish and fish habitat as defined in subsection 2(1) of the *Fisheries Act*; and
- Fish species subject to SARA 79(2).

The EAO evaluated the potential effects to the above by considering construction, operations and decommissioning activities that could affect fish habitat quality and quantity, fish distribution, fish abundance, and which could cause harm to fish.

Proposed Provincial Conditions and Key Mitigation Measures (CEAA 2012)

Based on mitigations proposed in the Application and issues raised during Application review, the EAO proposes the following provincial conditions and federal KMMs under CEAA 2012 (Appendix 1):

- Condition 10: Construction Environmental Management Plan (provincial condition);
- Fish Mitigations to Reduce Harm and Mortality (KMM);
- Fish Habitat Offset Plan (KMM); and
- Provincial conditions and KMMs outlined in the River Processes (Section 5.3) and Water Quality (Section 5.5) sections of this Report.

Residual Effects: After considering the proposed mitigation measures, the EAO predicts that TMJ would result in the following residual adverse effects on the Fish and Fish Habitat VC from the Application scenario and BVS:

- Habitat loss and alteration from the marine facility (i.e., piles), dredging, vibrodensification and scour protection (note the latter would be within the dredge pocket); and
- Potential harm to fish, including change in fish behaviour due to underwater noise during in-water works and injury or mortality due to machinery and vessels.

The EAO is not predicting any residual effects from marine shipping in the MSA on marine fish.

The EAO's characterization of the expected residual effects of TMJ on Fish and Fish Habitat VC is summarized below, as well as the EAO's level of confidence in the effects determination (including their likelihood and significance).

Table 15: Summary of Residual Effects: Habitat Loss and Alteration

Criteria	Assessment Rating	Rationale
Context	Low to moderate resilience	The habitat in the TMJ area has been previously disturbed from past industrial activity, which has decreased its resiliency. The habitat at the site is not known to contain critical habitat features such as spawning habitat for anadromous or resident fish species. For salmon and eulachon, the site is primarily regarded as a migration corridor, but may also serve as a nearshore rearing habitat for salmon. The EAO acknowledges that there is some uncertainty around use of the TMJ site by eulachon; therefore, the EAO has conservatively assumed the TMJ site is used by eulachon and could potentially support spawning for the purpose of the assessment. The benthic habitat has low productivity and is moderately resistant to change as benthic invertebrates are expected to re-colonize the site relatively quickly following dredging (less than four months).
Magnitude	Low	The habitat loss from the installation of piles (0.017 ha), scour protection, vibrodensification and dredging (~22.1 ha) and shading (~0.11 ha during construction and 0.66 ha during operations) would be low magnitude in

Criteria	Assessment Rating	Rationale
		terms of the effect to fish and fish habitat in general because the bottom substrate, salinity and water velocity are all predicted to be unchanged or within the range of baseline variation as a result of TMJ. Maintenance dredging would result in a depth change and may result in habitat alteration or degradation over time. The EAO anticipates that a *Fisheries Act* authorization would be required for TMJ; however, the scope of offset has not yet been determined. TJLP has proposed a conceptual offset to mitigate direct fish habitat loss from the jetty. The EAO has concluded low magnitude for eulachon as the habitat that may be altered by TMJ is considered to be low quality, non-essential habitat.
Extent	Site Specific	Habitat loss and alteration from installation of the marine facility and dredging would be limited to the TMJ site.
Duration	Long term	The loss of habitat due to the installation of the marine facility would be long term. TJLP's current offset proposal is designed to compensate for the direct habitat loss (piles) and TJLP predicts it would be functional in three years. The alteration effect to habitat due to repeated dredging may result in effects that extend to the longer term (i.e., life of project) as the dredge pocket may not have sufficient time between dredge events to recover.
Frequency	Single and Frequent	Habitat loss from installation of the marine facility, scour protection and vibrodensification: Single Habitat loss and alteration from dredging: Frequent (annually)
Reversibility	Reversible	The effects on habitat loss and alteration would be reversible after decommissioning.
Likelihood	There is a high likelihood that fish habitat would be affected.	
Significance Determination	Given the low to low-to-moderate magnitude of predicted effects, the limited geographic extent and the recommended KMMs under CEAA 2012 for Fish Mitigations to Reduce Harm and Mortality, Fish Habitat Offset Plan, and a follow up program for effectiveness of fish and fish habitat mitigations, the EAO concludes that the residual effects of the expected effects to fish habitat due to TMJ would not be significant.	
Confidence	The significance determination and likelihood rating for residual effects are determined with a moderate level of confidence, based on the proposed mitigation and offsetting measures, particularly existing federal regulatory requirements, well-developed industry best management practices and compliance with the proposed key mitigations. Uncertainly exists in the degree to which dredging would alter habitat over the long-term, the importance of the area as sturgeon and eulachon habitat, and predictions about the rate of re-colonization of benthic communities. Recommended KMMs under CEAA 2012 for Fish Mitigations to Reduce Harm and Mortality, Fish Habitat Offset Plan as well as a follow up program for effectiveness of fish and fish habitat mitigations, would be expected to reduce this uncertainty and would include an adaptive management component to mitigate effects.	

**Note: Magnitude definitions – Negligible: Project would likely have no measurable effect on fish populations or the function of fish habitat; Low: Residual effect would result in small measurable changes in abundance of fish, or result in the loss of low quality, non-essential fish habitat; Moderate: Residual effect would likely result in fish mortality with measurable changes in abundance of fish populations, or permanent loss of moderate or high-quality fish habitat. High: Residual effect would likely result in large effects on fish abundance occurring at a population level, or measurable effects, including mortality, on*

provincially listed or SARA-listed fish species, or loss of limiting or critical habitat for provincially-listed or SARA-listed fish species. Other criteria and assessment ratings are defined in Appendix 5: Residual Effects Characterization Definitions.

Table 16: Summary of Residual Effects: Potential Harm and Mortality to Fish

Criteria	Assessment Rating	Rationale
Context	**Underwater Noise:** Low to High Resilience **Vessel Strikes on Sturgeon:** Moderate Resilience	**Underwater Noise:** There are a large number of different fish populations that pass through the Fraser River LAA and RAA to complete their life cycle and some populations are less resilient then others to underwater noise. **Vessel Strikes on Sturgeon:** White sturgeon are provincially red-listed and assessed as threatened by COSEWIC. Green sturgeon are provincially red-listed and listed as special concern under SARA Recent surveys suggest the overall abundance of sturgeon is declining. Vessel strikes are considered to be a threat to sturgeon; however, they are not a primary threat or understood to be inhibiting population recovery.
Magnitude	**Underwater Noise:** Low **Vessel Strikes on Sturgeon:** Low	**Underwater Noise:** The magnitude of the effect is expected to be low. The mitigations are expected to limit noise to levels below the mortality/ potential mortality injury thresholds for pile driving; however, pile driving would exceed the behavioural effect threshold for pile driving. There are also still a variety of in-water works (during construction and dredging activities) that would exceed the disturbance thresholds for fish. This could cause fish to generally avoid the TMJ site area during those activities. **Vessel Strikes on Sturgeon:** Potential injury or mortality from TMJ on sturgeon could possibly cause a very small change on sturgeon abundance. High population-level effects from TMJ are unlikely in the Application scenario or BVS; however, the EAO acknowledges that the loss of a large, mature female could have a greater effect than the loss of a juvenile.
Extent	**Underwater Noise:** Site Specific **Vessel Strikes on Sturgeon:** Regional	**Underwater Noise:** The potential effects of behavioural change to fish due to underwater noise would be limited to the TMJ site. **Vessel Strikes on Sturgeon:** The effect would occur at the regional scale, within the RAA (downstream to Sand Heads); however, they are more likely in the marine terminal area as sturgeon may be attracted to the dredge pocket.
Duration	**Underwater Noise:** Short-term **Vessel Strikes on Sturgeon:** Short-term to Permanent	**Underwater Noise:** For most fish populations the duration of the effect is expected to be short-term. **Vessel Strikes on Sturgeon:** The potential for vessel strikes would exist for the life of TMJ. Depending on the nature and severity of the injury, the effect would range from short- to medium-term for injury. It would be permanent for an individual death, but the population would be expected to recover.
Frequency	**Underwater Noise:** Infrequent	**Underwater Noise:** Underwater noise is expected to be generated regularly during construction during pile-driving and other in-water

Criteria	Assessment Rating	Rationale
	Vessel Strikes on Sturgeon: Infrequent to Continuous	activities. It would be infrequent (nine working days a year) during operations due to annual dredging. **Vessel Strikes on Sturgeon:** There is a low probability for vessel strikes due to TMJ as the increase in vessel traffic over current conditions is small (~4% under the BVS), which is an average of one vessel call per day. There would be a very limited time period during which deep draft vessels (LNG carriers) would have propellers turning near the bottom of the dredge pocket. The majority of TMJ-related vessels would be bunker vessels, which are smaller than LNG carriers and could interact with sturgeon in the mid-water column and at the surface. There remains uncertainty in the frequency of vessel strikes, given the limited data on vessel strikes in the lower Fraser River and the linkage between vessel strikes and vessel class size.
Reversibility	**Underwater Noise:** Reversible **Vessel Strikes on Sturgeon:** Reversible	**Underwater Noise:** With mitigations in place, the exposure to recoverable behavioral changes (due to sub-injury underwater noise exposure) is expected to be reversible. **Vessel Strikes on Sturgeon:** Depending on the nature of the injury, the effect could be reversible for minor injuries. An interaction with TMJ-related machinery or vessels may lead to irreversible consequences at the individual sturgeon level; however, it is expected that the population could recover from the scale of potential effects from TMJ.
Likelihood	**Underwater Noise:** The likelihood of this residual effect is moderate. The proposed mitigations have been proven in a variety of aquatic environments; the results can be found in published peer reviewed literature and are commonly used in noise sensitive environments. **Vessel Strikes on Sturgeon:** It is likely that, during operations of a minimum of 30 years, vessel strikes would occur at some point. The increase in vessel traffic over current conditions due to TMJ-related vessels is small (~4% under the BVSA). Although population level residual effects are unlikely from TMJ, there remains uncertainty in the likelihood of population level effects given the limited data on vessel strikes in the lower Fraser River and the linkage between vessel strikes and vessel class size and fish size.	
Significance Determination	**Underwater Noise:** In consideration of the above assessment, the recommended federal KMMs under CEAA 2012 for Fish Mitigations to Reduce Harm and Mortality, which would include mitigations for underwater noise and timing of activities, and a follow up program for effectiveness of fish and fish habitat mitigations, the EAO concludes that underwater noise would not have a significant adverse effect on Fish and Fish Habitat. **Vessel Strikes on Sturgeon:** Considering the above analysis and the recommended KMMs under CEAA 2012 in the marine terminal area, the EAO is satisfied that TMJ would not have significant adverse residual effects on sturgeon through vessel strikes.	
Confidence	**Underwater Noise:** The EAO's confidence in the effects assessment is moderate. There is some uncertainty with regards to when different populations of fish could pass through the Fraser River LAA and how they might behave in response to the sounds. There is high confidence in the underwater noise modelling as it has been proven through use and the thresholds used for effects on fish are the results of long-term peer-reviewed studies. The effectiveness of the mitigation measures would also be monitored during construction	

Criteria	Assessment Rating	Rationale
	activities. The further reduction of this residual effect could occur through the implementation of additional mitigation measures that would be defined during detailed design and construction planning. **Vessel Strikes on Sturgeon:** The EAO's confidence in the effects assessment is moderate. There is uncertainty in the effect, frequency and likelihood of vessel strikes on sturgeon and whether sturgeon would be attracted to the deeper water created at TMJ by dredging. However, the EAO's confidence is high in the increase in vessel traffic from TMJ and the potential for interactions with sturgeon. There remains uncertainty in the likelihood of population level effects given the limited data on vessel strikes in the lower Fraser River and the linkage between vessel strikes and vessel class size and fish size.	

Note: Criteria and assessment ratings are defined in Appendix 5: Residual Effects Characterization Definitions.

The EAO assesses that the residual effects on fish and fish habitat from habitat loss and alteration and underwater noise would be of low magnitude, limited to the TMJ site, short- to long- term, reversible/ irreversible and moderate to high likelihood. The EAO assesses the risk on sturgeon injury and mortality from vessel strikes to be low magnitude, regional in extent, reversible and low likelihood. During the course of the EA, the EAO learned that while harm and mortality due to vessel strikes to sturgeon has not been recognized as a key threat to the species, information was shared during the EA that sturgeon may be vulnerable to vessel strikes due to their response behaviour and preference for dredge pockets. Compared to salmon, there is limited baseline information on population trends for white sturgeon in the Fraser River, so the EAO has applied the precautionary approach when determining the potential magnitude of effect from TMJ-related activities on sturgeon. The EAO has also considered potential effects from water quality (increases to TSS) but predicting that these would not adversely affect fish and fish habitat. With the proposed monitoring and mitigation measures, predicted increases to TSS would be within the range of existing variation. The EAO proposes Condition 12: Water Quality Management Plan and recommended KMMs under CEAA 2012 for water quality to manage potential effects to water quality during dredging, including a water quality monitoring program for turbidity, in accordance with the BC Ambient Water Quality Guidelines, with decision criteria and management actions.

The EAO considered the magnitude, extent and reversible nature of potential effects from habitat loss and alteration and noise, as well as the recommended KMMs under CEAA 2012 for a Fish Habitat Offset Plan and Fish Mitigation to Reduce Harm and Mortality. The EAO acknowledges the conservation status of the fish species and that there are no legislated or regulated thresholds for fish and fish habitat to define significance. Residual effects on Fish and Fish Habitat were determined to be significant if an ecological threshold is exceeded such that a fish population within the RAA is expected to no longer be self-sustaining or ecologically effective. Based on the consideration of all of the above factors, and DFO's rigorous review process that would be undertaken as part of the *Fisheries Act* authorization process, the EAO concludes that effects to Fish and Fish Habitat from TMJ would not be significant.

The EAO heard from several Indigenous Groups, including Tsleil-Waututh Nation, Tsawwassen First Nation, Musqueam Indian Band and Snuneymuxw First Nation, that they do not agree with the EAO's conclusions and significance determination for residual effects. The EAO understands the disagreement to be primarily related to differences in definitions for significance determination, views on the use of pre-contact baseline conditions for the assessment, the adequacy of baseline data and information to inform a structured assessment, and views on fish habitat offsetting success. Please refer to the Section 5.6.5 below for discussion about cumulative effects, including the perspective of Indigenous Groups on the EAO's cumulative effects conclusions, and Part C for more details on Indigenous Groups' views on residual and cumulative effects to fish and fish habitat.

5.6.5 CUMULATIVE EFFECTS ASSESSMENT

TJLP submitted a supplemental memo during the EA that included a cumulative effects assessment of the combined residual effects that TMJ, existing projects and reasonably foreseeable future projects could have on Fish and Fish Habitat through habitat loss, disturbance to fish from underwater noise, and direct mortality. TJLP predicted an increase in vessel traffic as a result of TMJ (over 2018 forecasted conditions) of ~1.5% (from approximately 18,278 to 18,552 one-way transits) for the Application scenario and ~4% (from ~18,278 to ~19,008) for the BVS. The increase in large vessel traffic (LNG carriers), is predicted to be ~4.1% for the Application scenario and ~3.5% for the BVS. LNG carriers would be similar in size to vessels that currently use the Fraser River (e.g., car carriers of similar length, width and draft call at Annacis Island along with container ships and bulk carriers that also call at the Port docks upstream of TMJ). The supplemental memo determined that the VFPA annual navigation dredging program, which is adjacent to TMJ, could interact cumulatively with TMJ to affect fish and fish habitat. However, the supplemental memo concluded that there would be no residual cumulative effects as TJLP stated there was no evidence of sturgeon mortality from the VFPA annual dredge program based on anectodoal information, and that the habitat in the area was not used for spawning by sturgeon.

The EAO heard from many Indigenous Groups on the Fraser River that participated in the EA, including Musqueam Indian Band, Tsleil-Waututh Nation, Tsawwassen First Nation, Maa-nulth Treaty Society, Quw'utsun Nation[72], Kwantlen and the People of the Rivers Office, on behalf of the S'ólh Témexw Stewardship Alliance, that Indigenous Groups disagreed with TJLP's assessment. Those Indigenous Groups concluded that TMJ was likely to contribute to existing significant cumulative effects on fish and fish habitat in the Fraser River. Based on concerns

[72] Quw'utsun Nation member Indigenous Groups include Cowichan Tribes, Halalt First Nation, Lyackson First Nation, Penelakut Tribe, and Stz'uminus First Nation. See Quw'utsun Nation's Part C Section 14.1.

raised about TJLP's cumulative effects assessment, the EAO has conducted its own cumulative effects assessment based on its own conclusions of predicted residual effects to habitat loss and alteration, behavioral disturbances from underwater noise and vessel strikes to sturgeon. Potential effects from underwater noise are predicted to be limited to the TMJ site.

The EAO acknowledges that the lower Fraser River has been, and continues to be, affected by industrial developments and urbanization. Most of the shorelines of the lower Fraser River have been diked; off-channels filled-in, diverted, or otherwise altered; and much of the riverbed is subject to regular dredging. The EAO has heard from Indigenous Groups that there is currently a high level of marine vessel traffic. These factors have affected the quality and suitability of fish habitat over time at the local and regional scales. Causal linkages between these impacts and the reasons for the current conservation status of species like eulachon and white sturgeon are known or suspected.

The EAO notes that the lower Fraser River White Sturgeon Designated Unit has been assessed by COSEWIC as Threatened. This listing has triggered a Recovery Potential Assessment[73] That document identifies three complementary candidate recovery thresholds: (i) 20,000 adults [age 22-55, 160-279 cm fork length], (ii) total abundance of 60,000 [age 7-55, 60-279 cm fork length], and (iii) a positive trend in juvenile abundance over a 50-year time window. These thresholds are not currently in effect, but it is expected they would comprise a key part of any Recovery Plan that might be developed for the species. The RAP concluded that "Although the population is expected to be above the survival threshold into the foreseeable future; if juvenile recruitment declines further (i.e., to half of the 2010-2019 levels), adult abundance could drop below the survival threshold within 50 years."

The EAO considers that the effects of past projects and activities are reflected in existing conditions. The EAO considered the following reasonably foreseeable future projects and activities that could potentially interact cumulatively with TMJ to affect fish and fish habitat (through effects to habitat in the RAA):

- VAFFC;
- Vancouver Fraser Port Authority Fraser River Annual Dredging Program;
- Seaspan Ferries Tilbury Terminal Expansion;
- FortisBC Tilbury LNG Plant Expansion Project;
- Fraser River Tunnel Project; and
- PBRP; and
- Delta Grinding Facility.

[73] DFO. 2021. Recovery Potential Assessment for Lower Fraser River White Sturgeon 2020. Canadian Science Advisory Secretariat, Science Advisory Report 2021/011. Available at: https://waves-vagues.dfo-mpo.gc.ca/library-bibliotheque/40975691.pdf

TMJ construction is not expected to overlap with any of the above noted projects. However, underwater noise from TMJ operations (that is, dredging) could potentially interact cumulatively with effects from other projects.

Construction and/ or operational noise from Seaspan, Fortis and Delta Grinding Facility (depending on if, and when, these projects proceed) which could result in fish avoiding the Tilbury Island nearshore area. The EAO conducted an EA of the VAFFC in 2012 and concluded that there would be residual effects to fish and fish habitat through the periodic removal of the benthic layer from dredging. Both the Delta Grinding Facility and the VFPA dredging program would also involve future dredging, and the Seaspan Ferries Tilbury Terminal Expansion may include dredging, which would remove the benthic layer and potentially cause residual effects to fish habitat and the fish that depend on it. The EAO considers the residual effect to fish habitat loss and alteration to be long-term (see Table 16 above). The EAO does not know the future dredge schedules for the reasonably foreseeable projects that include dredge components. However, it is reasonable to consider that there could be a temporal overlap between two or more projects in the fish RAA during the TMJ lifespan (that is, a temporal overlap when the effects to fish habitat alteration would interact cumulatively). In terms of habitat loss, the Delta Grinding Facility's March 2019 project description proposes the installation of piles, which could potentially cause habitat loss similar to TMJ's for the life of the project. The EAO has assumed that any future projects, such as those listed above, that would cause harmful effects to fish and fish habitat would need to obtain authorization under the federal *Fisheries Act* and potentially offset the habitat elsewhere.

The EAO also considered the potential for cumulative effects from TMJ with past, present and reasonably foreseeable future projects and activities on sturgeon strikes. The EAO identified existing vessel traffic (such as from the Fraser Surrey docks and tug traffic for various purposes), and the VAFFC (1.3 km downstream) and PBRP (9 km upstream) as having vessel activity with the potential to result in a cumulative effect with TMJ on sturgeon strikes. Although details are not available for the Seaspan Ferries Tilbury Terminal Expansion, Fraser River Tunnel Project, and Deas Island BC Hydro Transmission Line, there may be potential cumulative interaction with vessels strikes due to additional vessels; however, it is unlikely that the potential cumulative interactions of sturgeon with vessel strikes would result in population level effects.

The EAO understands that fish species in the lower Fraser River are experiencing cumulative effects; however, there are no established thresholds, neither DFO nor LWRS have conducted regional cumulative assessments on the species evaluated in this EA and there are no recovery

strategies[74] or action plans in place for the species assessed. The EAO is recommending KMMs under CEAA 2012 for Fish Mitigations to Reduce Harm and Mortality and a Fish Habitat Offset Plan. The EAO concludes that with mitigations and offsetting measures for TMJ, there would be non-significant residual cumulative effects on Fish and Fish Habitat from the interaction of TMJ (both Application scenario and BVS) with other reasonably foreseeable projects. The EAO acknowledges there is some uncertainty in the significance conclusion related to the absence of established threshold and recovery strategies or action plans in place for the species assessed, and uncertainties around proposed mitigation measures for foreseeable projects that are capable of contributing to future cumulative adverse effects.

The EAO is aware that TJLP has committed to contribute up to $2 million to the FNFLF[75], which is a program led by several Indigenous Groups that supports recovery programs for chinook salmon, eulachon and sturgeon in the Fraser River and Salish Sea. For more information about the EAO's consideration of TJLP's contribution proposal, refer to Section 13.1 on Current Context and Cumulative Effects in Part C.

The EAO heard from Indigenous Groups that there are significant cumulative effects at baseline, with or without TMJ, and that TMJ contributes to existing significant cumulative effects. Indigenous Groups have informed the EAO that they are unable to catch fish species in either the amount or preferred areas in the RAA to meet cultural practices needs. The EAO acknowledges that others, notably Tsawwassen First Nation, have concluded that the information available in this EA supports a different assessment outcome; namely, it is their view that TMJ will have significant adverse cumulative effects on fish and fish habitat and that adverse residual effects are of a greater magnitude and likelihood than the EAO has concluded. Tsawwassen First Nation concludes that, for many years and at present, sturgeon and eulachon (and their habitat) have been experiencing significant adverse cumulative effects in the Project Area. The domestic harvest of sturgeon by Tsawwassen citizens has been terminated due to conservation concerns, while their domestic harvest of eulachon is but a fraction of what it once was and what the Tsawwassen First Nation feels it should be. It is Tsawwassen First Nation's view that the residual adverse effects from TMJ and other 'reasonably foreseeable' projects will only worsen what is already an unacceptable situation and will undermine the efficacy of the initiatives necessary to recover important species and restore their habitat. Tsawwassen First Nation concludes that existing information gaps and the limitations of the

[74] Under SARA, critical habitat would be defined in the recovery plan. Critical habitat is defined as "the habitat that is necessary for the survival or recovery of a listed wildlife species that is identified as the species' critical habitat in the recovery strategy or in an action plan for the species" and is legally protected from destruction.

[75] TJLP's proposal for Unconventional Offsetting Accommodation for Residual Project and Cumulative Effects, dated July 5, 2021 (https://www.projects.eao.gov.bc.ca/api/document/61099898cd98620022b0832b/fetch/20210707_TilburyJettyLimitedPartnership_UnconventionalOffsetProposal.pdf).

mitigation measures put forward to date will necessitate adaptive management responses in the lower Fraser River (including potentially foregoing projects like TMJ) as new information is gathered through the implementation of recovery strategies and as research and monitoring of these species improves our understanding of their ecology and threats to their recovery in the lower Fraser River.

The Indigenous Groups' perspective on the state of fish at baseline is integrated into the cumulative effects conclusions Current Use of Lands for Traditional Purposes (Section 11.4 of this Report) assessment. For the assessment of effects to Aboriginal Interests and Treaty rights, please refer to the Part C assessment.

5.6.6 CONCLUSIONS

Considering the above analysis and the EAO's recommended KMMs under CEAA 2012 (Appendix 1) for Fish Mitigations to Reduce Harm and Mortality, and a Fish Habitat Offset Plan, and follow up program for effectiveness of fish and fish habitat mitigations, and provincial conditions and KMMs outlined in the River Processes (Section 5.3) and Water Quality (Section 5.5) sections of this Report, the EAO is satisfied that TMJ would not have significant adverse residual effects or significant cumulative effects on Fish and Fish Habitat.

5.7 MARINE MAMMALS

5.7.1 BACKGROUND

Marine Mammals was selected as a VC because of the potential for adverse effects from the TMJ due to dredging, pile driving and vessel operations. Marine mammals are top predators in the food chain and are key indicators for marine ecosystem health. In addition to having importance to Indigenous Groups and the public, marine mammals are subject to federal legislation such as CEAA 2012, the *Fisheries Act* and SARA.

The subcomponents selected for the Marine Mammals VC assessment included:

- Harbour seal – Pacific subspecies;
- California sea lion;
- Steller sea lion[76];
- Harbour porpoise – Pacific Ocean population;
- Killer whale – Northeast Pacific southern resident population (SRKW)[77];

[76] Marine mammal species also selected as a subcomponent for the MSA.

[77] Ibid.

- Killer whale – Northeast Pacific transient population;
- Humpback whale – North Pacific population[78]; and
- Grey whale – Eastern North Pacific population.

The indicators selected for the Marine Mammals VC assessment were:

- Habitat quality and quantity: area of habitat permanently removed/ altered; and
- Abundance and distribution: change in species presence and relative abundance.

Tilbury Marine Jetty Limited Partnership's effects assessment of the Marine Mammals VC was influenced by the Noise (Section 6.2), the River Processes (Section 5.3), Water Quality (Section 5.5) and Fish and Fish Habitat (Section 5.6) assessments in this Report. The results of the Marine Mammals assessment are incorporated into the Current Use chapter (Section 11.4) in this Report. Potential effects on marine mammals from accidents and malfunctions, including spills of toxic or hazardous materials, during construction, operations, and decommissioning are assessed in the Accidents and Malfunctions chapter (Section 9) in this Report.

For the EAO's assessment of potential effects of dredge disposal to marine mammals, refer to the Alternative Means of Undertaking the Project (Section 2.2.5) of this Report.

MARINE SHIPPING ASSESSMENT

The assessment of potential effects on marine mammals in the MSA used subcomponent species that were selected as representative of other species groups, based on their conservation status and their importance to regulatory agencies, Indigenous Groups and the public. SRKW was chosen to represent toothed whales, the humpback whale to represent baleen whales, and the Steller sea lion to represent pinnipeds.

Indicators selected for the Marine Mammals VC in the MSA were:

- Population abundance (health) and distribution: avoidance of habitat areas or acoustic disturbance/ injury as well as potential for vessel strikes.

5.7.1.1 REGULATORY CONTEXT

Marine mammals and their habitats are protected under federal legislation, including the federal *Fisheries Act* (amended August 28, 2019) through the Marine Mammal Regulations, and SARA. The *Fisheries Act*, administered by DFO, is the main statute related to the conservation and protection of marine fish and marine mammals. The Marine Mammal Regulations under the *Fisheries Act* prohibits the disturbance of marine mammals by any person except when fishing for marine mammals under the authority of the Regulations or

[78] Ibid.

when carrying on a work, undertaking or activity that is authorized, otherwise permitted or required under the *Fisheries Act*. The Marine Mammal Regulations for vessel approach distances do not apply to vessels in transit (that is, any vessel travelling directly from one point in the water to another, such as TMJ LNG carriers).

CEAA 2012 requires an assessment of environmental effects on fish and fish habitat as defined in subsection 2(1) of the *Fisheries Act*. CEAA 2012 Section 5 (a) (i and ii) are relevant for assessing effects on marine mammals as they are defined as fish in the *Fisheries Act*.

SARA prohibits killing, harming, capturing or harassing species listed on Schedule 1 as endangered, threatened or extirpated and protects critical habitat[79] that supports these species. SARA requires that EAs identify adverse effects of projects on the SARA-listed species and their critical habitat and requires that measures be taken to avoid or lessen those effects and to monitor them.

There are a number of SARA-listed marine mammal species in the TMJ RAA. The following recovery planning documents under SARA are relevant to the conservation of marine mammals in the area:

- SARA Management Plans for Steller sea lion (DFO, 2011a), harbour porpoise (DFO, 2009), and grey whale (DFO, 2011b);
- SARA Recovery Strategies for SRKW (DFO, 2011c; DFO, 2018), west coast transient (Bigg's) killer whale (DFO, 2007) and humpback whale (DFO, 2013);
- Action Plan for the Northern and SRKW (*Orcinus orca*) in Canada (DFO, 2017); and
- SRKW Imminent Threat Assessment (Government of Canada, 2018).

DFO is responsible for administering SARA for aquatic species at risk. Since 2009, critical habitat for the SRKW has been protected against destruction under a SARA 58(4) Protection Order. The original Application RAA and MSAA (as described in Section 5.7.1.2) overlap a portion of the critical habitat for SRKW. TMJ-related shipping is the only proposed TMJ-related activity in the critical habitat for SRKW.

To protect SRKW, the federal government has taken recent regulatory actions to address imminent threats, improve prey availability and reduce disturbances in critical habitat. To reduce acoustic and physical vessel-related disturbances, three interim sanctuary zones in critical SRKW habitat at Swiftsure Bank and North Pender and Saturna Islands were enacted and extended under the *Canada Shipping Act*, 2001 in 2019, 2020, and 2021, respectively (Figures 5 and 6). To address vessel-related disturbance to whales, on June 1, 2020, the mandatory

[79] Under SARA, critical habitat is defined as "the habitat that is necessary for the survival or recovery of a listed wildlife species that is identified as the species' critical habitat in the recovery strategy or in an action plan for the species" and is legally protected from destruction.

approach distances for killer whales in all southern B.C. coastal waters between Campbell River and just north of Ucluelet was increased to 200 and 400 m for pre-authorized whale-watching vessels and all other vessels, respectively. To further reduce acoustic and physical vessel-related disturbances in B.C. coastal waterways, the Marine Mammal Regulations (under the *Fisheries Act*) were amended to increase the mandatory approach distances to 200 and 100 m for killer whales and most other whales, dolphins and porpoises in all other coastal waters of B.C., respectively. To improve prey availability and further reduce disturbances to SRKW in their critical habitat, interim seasonal closures for recreational and commercial salmon fishing in key foraging areas for SRKW in the Strait of Juan de Fuca and Gulf Islands were established in 2019, 2020, and 2021. In 2021, DFO piloted a fishing closure protocol for the southern Gulf Islands recreational and commercial salmon fisheries, where fishery closures are triggered by the first confirmed presence of SRKW in the area.

5.7.1.2 BOUNDARIES

The LAA for the Marine Mammals VC included marine waters within 1.5 km of the TMJ site (the onshore and offshore components of TMJ) and a 50 m buffer on either side of the shipping route extending out to Sand Heads. The RAA included the South Arm of the Fraser River downstream of the TMJ site to Sand Heads and included a 1.5 km buffer upstream of the site (see Figure 5).

MARINE SHIPPING ASSESSMENT

The spatial boundaries for the MSA considered potential effects from TMJ-related shipping. The boundaries for the MSA were not an extension of the spatial boundaries described in the Application, but rather a separate, additional study area.

The MSAA included the marine areas between Sand Heads and the 12-nautical mile limit of Canada's territorial sea, within the inbound and outbound shipping channels in the Strait of Georgia, Boundary Pass, Haro Strait and Juan de Fuca Strait. The MSAA boundaries were selected in consideration of the extent of potential direct physical effects (for example, injury or mortality from vessel strikes and underwater sound) and potential indirect effects (for example, changes in marine mammal behaviour and masking effects from vessel underwater sound).

The MSAA also encompassed the area within which direct and indirect effects have the potential to occur and within which cumulative effects were assessed. To facilitate the analysis of potential TMJ-related effects and cumulative effects from marine shipping, the MSAA was divided into Segments A through G. A map of the MSA spatial boundaries is shown in Figure 6.

5.7.2 POTENTIAL PROJECT EFFECTS AND PROPOSED MITIGATIONS IN THE APPLICATION

5.7.2.1 BASELINE INFORMATION

Existing marine mammal conditions in the LAA, RAA and MSAA were determined through a combination of a literature review of existing data sources, traditional use and traditional ecological knowledge (TEK), underwater acoustic modelling and a marine mammal reconnaissance survey (see the Application Sections 3.3.3 and 4.3.2.1 for all sources).

Marine mammal species at risk listed on Schedule 1 of SARA potentially occurring in the Application LAA and/ or RAA are: killer whale [populations: Northeast Pacific SRKW, west coast transient (Bigg's) killer whale, and northeast pacific offshore killer whale], harbour porpoise, humpback whale, grey whale and Steller sea lion. There have been no reported sightings of grey whale in the LAA. TJLP noted that the only marine mammal species with the potential to occur in the LAA near the TMJ site (based on baseline surveys and historical sightings records) are harbour porpoise and harbour seal. Critical habitat under SARA has been designated for SRKW in the Salish Sea, which overlaps with the MSAA (see Figure 6).

In the MSAA, there are 25 species of cetacean (whales, dolphins, and porpoises), five species of pinnipeds (seals and sea lions), and one species of sea otter known to occur in B.C. seasonally or year-round depending on their life history. Several species of marine mammals are known to occur in the MSAA. Six of these species are listed as at risk under Schedule 1 of SARA, including SRKW (endangered), northeast pacific transient (Bigg's) killer whale (threatened), harbour porpoise (special concern), north pacific humpback whale (special concern), Steller sea lion (special concern), and grey whale (eastern north pacific population) (special concern).

5.7.2.2 POTENTIAL PROJECT EFFECTS

This section provides an overview of potential effects to marine mammals identified in the Application and MSA.

DIRECT LOSS OF HABITAT

TJLP predicted that direct habitat loss would occur from the construction of associated offshore facilities, dredging (during construction and maintenance during operations), in-river ground stabilization and pile works and installation of scour protection. Work for both the temporary berth and jetty would occur during the least risk fisheries window specified by DFO.

TJLP concluded that while construction of infrastructure and dredging would result in a loss of marine mammal habitat, it would be minor relative to the overall amount available in the region and, because the site is located in freshwater approximately 21 km from the mouth of the Fraser (measured from Sand Heads), it would not overlap with any known high use, sensitive, or critical marine mammal habitat. TJLP stated that there would be no expected

influence on the short- or long-term viability of marine mammal populations and that negligible residual effects on habitat quantity were predicted.

CHANGES IN PREY DISTRIBUTION DUE TO WATER QUALITY AND SHADING

The potential effects from changes in water quality (for example, increased total suspended solids [TSS] due to sediment disturbance) on marine mammal prey are discussed in Water Quality (Section 5.5) and Fish and Fish Habitat (Section 5.6) sections of this Report. TJLP explained that increased TSS levels would be limited to areas that are non-critical or low use marine mammal habitat. In-water works (for example, dredging) that would increase TSS in the Fraser River would mainly occur during the least risk fisheries window, which would reduce effects marine mammals.

The potential effects of shading are reviewed in greater detail in Section 5.6.2.2 Fish and Fish Habitat. TJLP predicted that there would be negligible loss of aquatic vegetation due to shading from the installation and operation of offshore facilities and that this would therefore not have significant effects on marine mammal prey availability.

EFFECTS FROM POTENTIAL SPILLS

Accidents and malfunctions have the potential to occur during all phases of TMJ and cause an unintentional release of deleterious substances into the environment that have the potential to adversely affect marine mammals and their prey. The potential effects of accidents and malfunctions are assessed in the Accidents and Malfunctions (Section 9) of this Report.

DISTURBANCE AND HABITAT AVOIDANCE DUE TO UNDERWATER NOISE AND VIBRATION

Marine mammals use underwater sound as a means of communication, navigation and prey detection. Underwater noise was predicted to affect marine mammals during all phases of TMJ. The potential effects of underwater noise on marine mammals depends on a host of factors including the type of marine mammal, their hearing abilities, ambient noise levels and environmental sound transmission properties (for example, water column characteristics). Depending on the received levels of sound, the associated effect to the marine mammal can range from subtle behavioural changes (for example, movement away from the sound source, change in dive patterns) to strong disturbance effects (for example, change in foraging patterns, habitat avoidance, interference with communication).

Underwater noise at high enough levels and duration can cause physical injury in the form of a temporary or permanent loss of hearing sensitivity. These are respectively referred to as temporary threshold shifts and permanent threshold shifts. TJLP explained that there are currently no legislated underwater noise criteria in Canada for assessing noise effects on marine mammals. For behaviour effects, TJLP referenced the US National Marine Fisheries Service behaviour thresholds for all marine species as 120 dB re 1µPa (SPLrms) for non-impulsive (continuous; e.g., vibratory pile-driving, vessel noise) noise, and 160 dB re 1µPa

(SPLrms) for impulsive (e.g., impact pile driving) noise levels. It should be noted that these disturbance thresholds apply to all marine mammals and do not consider species-specific hearing abilities, and do not account for the overall duration of the noise. TJLP noted that these thresholds are considered conservative.

TJLP identified the following activities as the main sources of TMJ-generated underwater noise: ground stabilization works, impact pile driving, vessel traffic and dredging. The results of acoustic modelling conducted by TJLP showed that impact pile driving is the one activity that, without mitigation, has the potential to exceed both injury and disturbance thresholds over a considerable distance (up to 6.2 km away for highly sensitive species). Underwater noise from pile driving, construction dredging and ground stabilization would occur over a period of 36-90 days during Construction. Annual maintenance dredging would occur over a period of nine working days.

TJLP noted that the prediction of effects was limited by the understanding of how marine mammals respond to various environmental changes. These limitations included the use of US guidelines for assessing disturbance effects on marine mammals from underwater sound which may have limitations in the Canadian context, use of the underwater sound model based on third-party data and models of other projects in the region, a lack of consensus in the scientific community on how best to quantify masking effects in marine mammals, and the limited understanding of the effectiveness of the proposed environmental design features and mitigation for reducing effects.

Given this uncertainty, TJLP stated that mitigation measures have been proposed to limit the effect of impact pile driving (as detailed in Section 5.7.2.3) and are expected to considerably reduce the zone of injury and disturbance. For the other TMJ activities, including ground stabilization works, vessel traffic and dredging, TJLP concluded that exceedance of the injury thresholds would occur in distances relatively close to the source where it would be unlikely to interact with marine mammals.

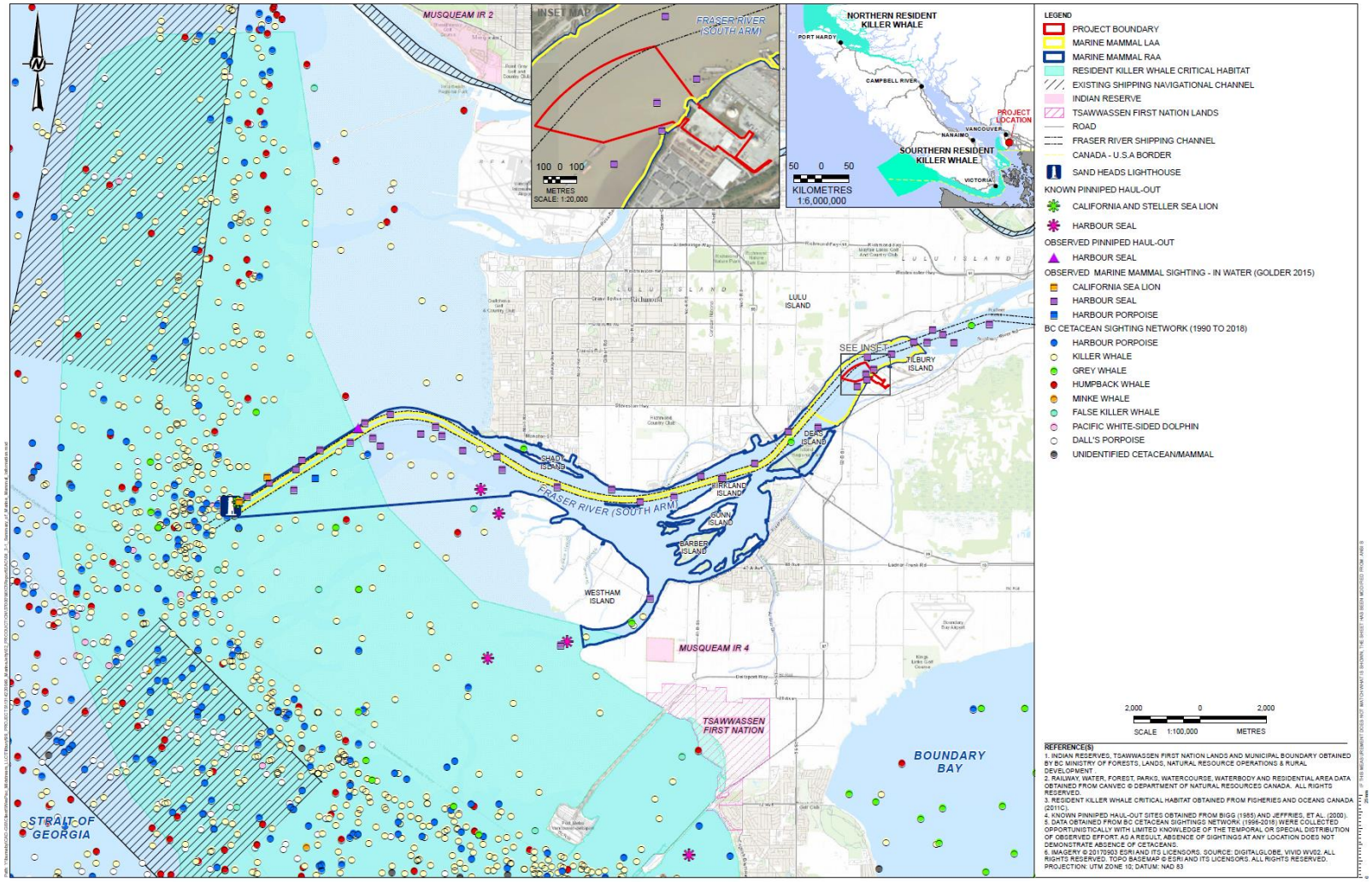

Figure 5: Marine Mammal LAA and RAA and Summary of Marine Mammal Information Near the LAA and RAA.

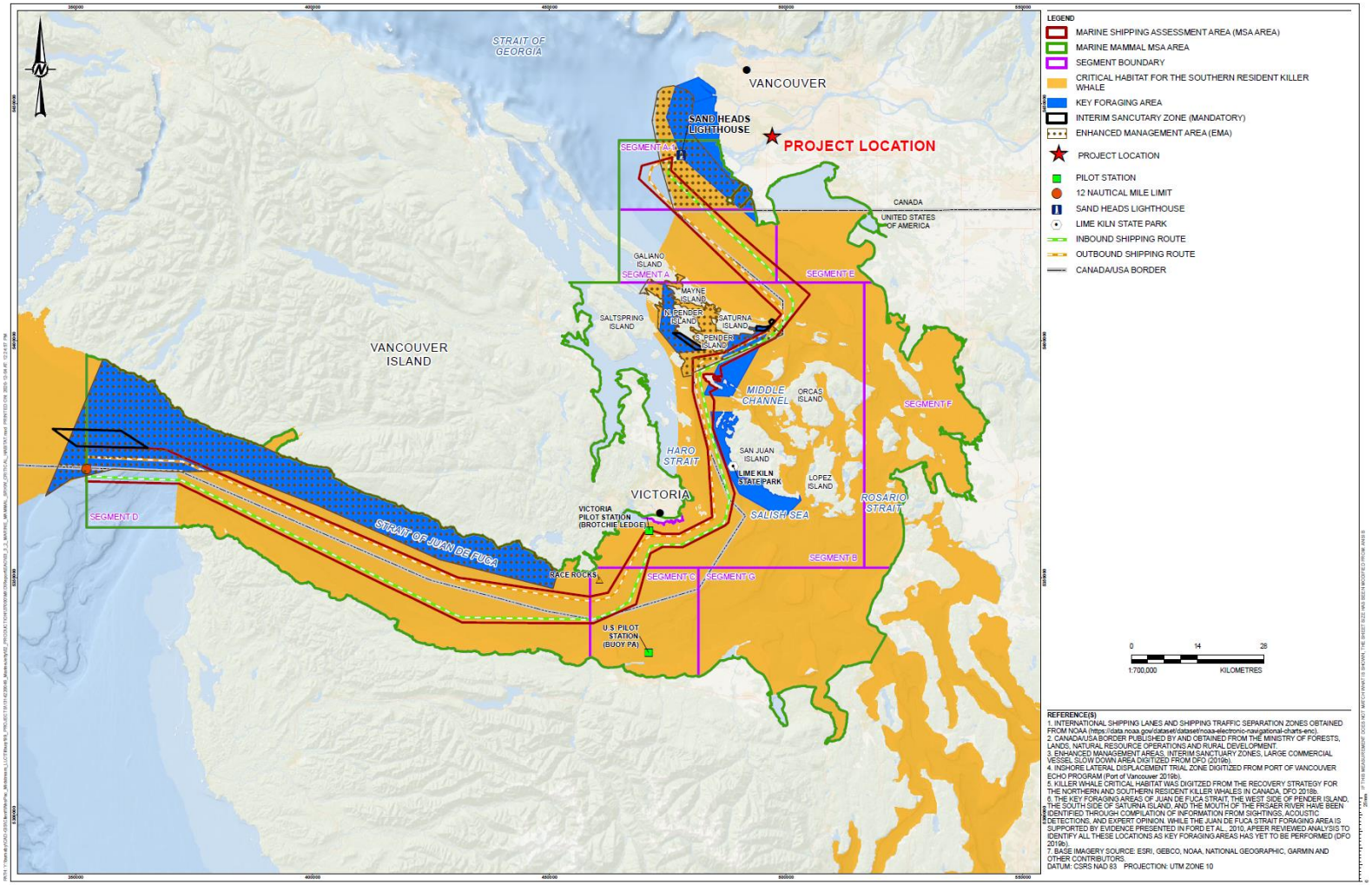

Figure 6: Marine Mammal MSA Area and Southern Resident Killer Whale Critical Habitat and Sensitive Areas.

INJURY OR MORTALITY DUE TO VESSEL STRIKES

There is the potential for injury or direct mortality to marine mammals due to vessel movements during all phases of TMJ. A variety of factors could affect the possibility of a vessel strike, including the speed and size of the vessel, the marine mammal species and the ambient noise levels interfering with the sound of the vessel. TJLP explained that vessels over 80 m long and travelling at speeds greater than 13-15 knots are more likely to cause ship strikes and mortality. Vessel strikes are infrequent at speeds less than 14 knots and rare at speeds less than 10 knots. Slower vessels would give the marine mammals more time to move away and for operators to detect and attempt to avoid individuals. As identified in the Application (Table 4.3-18), the speed of vessels traveling in the Fraser River is expected to be 10 knots, when safe, a speed at which strikes are considered unlikely[80]. TMJ would use the following lengths of vessels: FraserMax vessel (~250-295 m), LNG vessel (~250 m), bunker vessel (~150 m), tug (28 m), and water taxi (<10 m).

SRKW are considered to have a low resilience to imposed stresses associated with potential vessel strikes due to their continued state of decline and vulnerability from other stressors and considering that the loss of any individual could have population level-effects. The population of SRKW is currently estimated at 73 individuals[81]. TJLP concluded that SRKW and other toothed whales are considered to be at relatively low risk of vessel strikes due to their speed and agility and sensitive underwater hearing abilities. Vessel collisions have recently been added as an emerging threat for SRKW within their recovery plan due to evidence that J34 (an individual SRKW) died as a result of blunt force trauma from a vessel strike. Although this has been the only individual within the SRKW population reportedly struck by a vessel since 2008, the loss of one individual could exceed the resiliency of this population.

Despite current levels of vessel traffic and associate vessel strikes, the population of north pacific humpback whales have been growing at an annual rate of 4 to 7 percent and in 2017 the species was down-listed from Threatened to Special Concern under Schedule 1 of SARA. As a result, the population is considered to have a moderate resilience to effects associated with marine shipping activities due to their continued state of growth in the presence of current conditions.

TMJ is expected to increase shipping in the MSAA by 118 TMJ vessels annually (68 LNG carriers and up to 50 LNG bunker vessels per year). A tug escort is required for inbound and outbound

[80] TJLP defined likelihood: low likelihood of occurrence (0 to 40%) - residual effect is possible but unlikely; moderate likelihood of occurrence (41% to 80%) - residual effect may occur but is not certain to occur; and high likelihood of occurrence (81% to 100%) - residual effect is likely to occur or is certain to occur.

[81] Based on SRKW population estimate as of July 2022.

transits through Boundary Pass and Haro Strait from Saturna Island to the Pilot Station near Victoria, B.C. (see Figure 6). This would result in approximately one TMJ vessel every three days and one vessel movement every day and a half, or 236 movements every year. There are currently an estimated 21,200 to 111,300 vessel movements annually (including pleasure craft with automatic identification systems) in Segments A though D in the MSAA. TMJ-related shipping would incrementally increase current vessel movement numbers by an average of 0.6 percent annually (0.2 percent to 1.1 percent depending on segment).

BUNKER VESSEL SCENARIO

In the BVSA, TJLP concluded that increased bunker vessel traffic would not change the conclusions for changes in marine mammal habitat quality resulting from changes in water quality and underwater noise causing reduced prey availability in the original Application area (i.e., jetty to Sand Heads). TJLP assessed the potential changes in abundance and distribution of marine mammals due to underwater noise and injury and/or mortality from vessel strikes in the original Application area, as a result of increased in bunker vessels traffic. Bunker vessels are expected to generate noise levels similar to or lower than tugs, and the disturbance area generated by bunker vessels would be smaller (approximately 9 times smaller) than the LNG carriers that were assessed in the Application. TJLP concluded that the increase in the number of bunkering vessels increases the potential frequency (to continuous) for disturbance effects to marine mammals due to underwater noise, and that all other characterizations for the residual effect remained consistent with the Application. TJLP concluded that behavioural disturbance from underwater noise is considered not significant. In terms of vessel strikes, TJLP concluded that the frequency of the residual effect would remain very rare (infrequent) given the proposed federal conditions, and the low number of baleen whales (more susceptible to vessel strikes) in the RAA. TJLP concluded that the residual effects of injury and/or mortality from vessel strikes is not significant.

5.7.2.3 MITIGATION MEASURES PROPOSED IN THE APPLICATION

TJLP proposed the following mitigation measures to reduce the effects of TMJ on marine mammals:

- **Prioritization of vibratory pile driving methods over impact pile driving:** Piles would be vibrated through the overburden using a vibratory hammer until this is no longer possible, at which point impact pile driving would be used. Using a vibratory hammer instead of impact pile driving during construction would reduce underwater noise and the zone of injury and behavioural disturbance to marine mammals. For example, for high frequency cetaceans, the zones of injury and behavioural disturbance would be reduced from 6.2 km (limited by land) to 26 m and 1.2 km respectively with the use of vibratory pile driving methods;
- **Installation of bubble curtain**: Bubble curtains would reduce underwater noise from pile driving activities by 5 to 30 dB depending on the depth of water. TJLP estimated

that a reduction in 15 dB would reduce the potential injury zone from impact pile driving from 6.2 km (limited by land) to 858 m for most marine mammals[82];

- **Ramp-up/ soft-start procedure:** This would entail the initial activation of the equipment at the quietest level possible and then gradually increasing the sound (typically within a 30-minute period) until the needed intensity to give acoustically sensitive marine mammals time to leave the area;
- **Sequencing of in-water works**: In scenarios where several underwater noise activities are planned, TJLP would sequence activities whenever possible to avoid the aggregation of underwater noise;
- **Marine Mammal Management Plan:** To reduce effects of underwater noise on marine mammals during pile driving and dredging activities, through the use of a marine mammal safety/ detection zone;
- **Shut-down of vessel during LNG transfer**: Shut down of vessel engines and propellers while moored to reduce potential injury and disturbance to marine mammals;
- **Vessel Traffic Management**: LNG carriers and bunkers would move at less than 13 knots in the LAA and RAA, follow established routes, and maintain a constant course and speed to the extent practical (for example, subject to human health and safety considerations) and at the discretion of the pilot as part of their overall responsibility for the safe navigation of a vessel;
- **Do not disturb marine mammals:** Adhere to the 2018 Marine Mammals Regulations (or any future updates to the regulations) to avoid disturbing marine mammals from vessel operations;
- **Accidental contact with marine mammals:** Report accidental contact between a vessel and marine mammals to DFO and Indigenous Groups within 24 hours, including the information specified in the Marine Mammals Regulations. This would help to provide information on how to avoid accidental contact in the future;
- **Constant course and speed:** All TMJ vessels would maintain a constant course and speed, to the extent practical (for example, subject to human health and safety considerations), when operating in the MSAA, and at the discretion of the pilot as part of their overall responsibility for the safe navigation of a vessel; and
- **Voluntary ECHO Program slowdown initiatives:** TJLP committed to incorporating contractual measures to support participation of TMJ-related vessels in the VFPA-led ECHO Program seasonal slowdown initiatives, to limit potential disturbance and masking effects to SRKWs.

No additional mitigation measures were proposed by TJLP as part of the BVSA.

[82] Refer to Table 4.3-16, in Section 4.3 of the Application for more details.

5.7.3 POTENTIAL PROJECT EFFECTS AND PROPOSED MITIGATIONS IDENTIFIED DURING APPLICATION REVIEW

The following key issues related to the assessment of Marine Mammals for TMJ were identified during Application review and based on feedback from the Working Group:

- Persistent organic pollutants; and
- Vessel strikes

PERSISTENT ORGANIC POLLUTANTS

ECCC and Musqueam Indian Band questioned whether TMJ had the potential for adverse effects to SRKW from persistent organic pollutants (POPs), in particular PCBs or polybrominated diphenyl ethers (PBDE) exposure downstream of TMJ. Musqueam Indian Band noted that dredging could bring historic contaminants to the surface and re-suspend as TSS.

> TJLP conducted additional sediment sampling and analysis to predict whether resuspended sediment would contribute to PCBs or PBDE in SRKW critical habitat. Sampling showed that concentrations of total PCBs were less than CCME sediment quality guidelines, Fraser River Sediment Quality Objectives, and B.C.'s marine and freshwater SWQGs for sediments. TJLP concluded that dredging is not expected to increase PCBs in downstream SRKW critical habitat above the baseline conditions. Sediment sampling showed that concentrations of PBDE did not exceed Federal Environmental Quality Guidelines (FEQGs) at the TMJ site.

ECCC noted that the FEQGs are not intended to be protective of PBDE exposure through food chain bioaccumulation. However, ECCC is of the view that dredging is not expected to increase PBDE concentrations in SRKW critical habitat above thresholds that are specific to the protection of marine mammals from PBDE bioaccumulation.

The EAO has considered ECCC's views that, based on the additional PCB and PBDE sampling and analysis, it would be reasonable to conclude that dredging of sediments is unlikely to increase PCB or PBDE concentrations in SRKW critical habitat above current conditions or above protective thresholds. The EAO acknowledges that there is some uncertainty with respect to the level of conservatism in TJLP's assessment; however, the EAO is satisfied that there is sufficient information and analysis to inform the EAO's understanding about potential residual effects to SRKW through organic pollutant transport.

VESSEL STRIKES

Tsawwassen First Nation, Tsleil-Waututh Nation and DFO expressed concerns that the mitigations for vessel traffic management were overly optimistic in terms of effectiveness. Namely, they questioned the ability of large vessels to slow down and move away from animals.

Additionally, Tsawwassen First Nation and DFO noted that strikes at slower speeds could still result in serious injury or death, and that propeller strikes could be very grave to large whales.

> TJLP explained that the vessel traffic management mitigations would apply to all vessels and agreed with DFO that the effectiveness would be greater for smaller vessels as they could change speeds and maneuver more easily. However, TJLP noted that it could be possible for larger LNG carriers to avoid interactions upon detection of a marine mammal, depending on their distance from the individual. Additionally, TJLP pointed to the proposed vessel traffic management mitigation measures, aside from just speed limitations, and noted that collectively the measures were highly effective at reducing vessel strikes.

The EAO is recommending a key mitigation under CEAA 2012 to develop a Vessel Traffic Management Plan that contains vessel traffic management mitigations, including speed limits in the Fraser River, participation in the VFPA-led ECHO Program seasonal slowdown initiatives in the MSAA, and use of the WhaleReport Alert System to reduce the likelihood of vessel strikes with marine mammals. Given the potential for mortality from a variety of types of vessel strikes, the EAO has carried forward injury or mortality from vessel strikes as a residual effect in the conclusions section below.

5.7.4 THE EAO'S ANALYSIS AND CONCLUSIONS ON EFFECTS TO MARINE MAMMALS

This section presents the EAO's conclusions on the potential adverse residual effects from TMJ on:

- The Marine Mammal VC;
- CEAA 2012 5(1)(a)(i): fish and fish habitat as defined in subsection 2(1) of the *Fisheries Act*; and
- Marine mammal species subject to SARA 79(2): Steller sea lion, harbour porpoise, SRKW, transient killer whale, humpback whale and grey whale.

The EAO evaluated the potential effects to the above by considering construction, operations and decommissioning activities that could affect marine mammals through changes to habitat quality, loss of habitat, changes in abundance and distribution through underwater noise, and injury or mortality due to vessel strikes.

Proposed Provincial Conditions and Key Mitigation Measures (CEAA 2012)

Based on mitigations proposed in the Application and issues raised during Application review, the EAO is recommending the following KMMs under CEAA 2012:

- Marine Mammal Management Plan (KMM) to mitigate effects from activities at the TMJ site to marine mammals, also capturing mitigations listed in Section 5.7.2.3 of this Report; and
- Vessel Traffic Management Plan (KMM) to reduce the likelihood of vessel strikes and reduce underwater noise from shipping, also capturing mitigations listed in Section 5.7.2.3 of this Report.

Residual effects: After considering all relevant proposed mitigation measures, the EAO concludes that TMJ would result in the following residual adverse effects to Marine Mammals for the Application scenario and BVS:

- Physical injury from underwater noise of impact pile driving during construction;
- Behavioral changes from underwater noise due to ground stabilization works, impact pile driving, vessel operations, and dredging during construction and operations; and
- Physical injury or mortality due to vessel strikes.

The EAO's characterization of the expected residual effects of TMJ on Marine Mammals (Table 17) is summarized below, as well as the EAO's level of confidence in the effects determination (including their likelihood and significance).

Table 17: Summary of Residual Effects to Marine Mammals Due to Underwater Noise

Criteria	Assessment Rating	Rationale
Context	Low to Moderate Resilience	**SRKW – Low:** Species at risk in the RAA and MSAA, such as SRKW, would have low resilience to underwater noise due to their vulnerability. SRKW are within the zone of potential behavioural change from vessel movement. SRKW are SARA-listed, and the populations is considered at risk due to their low reproductive rate, small population size, and susceptibility to anthropogenic threats. **Other Marine Mammals – Low-Moderate**: Marine mammals in the LAA, RAA and MSAA are expected to have low to moderate resiliency to underwater noise. There is no sensitive marine mammal habitat in the most conservative zone of potential injury for underwater noise (within 6.2 km from the site, based on unmitigated impact pile driving).
Magnitude	Low to Moderate	**Low to Moderate – behavioural disturbance**: Noise from vessel operations, ground stabilization and dredging would exceed the behaviour threshold from 367 m- 3.6 km away from the source for both the Application scenario and BVS. There is the potential for disruption of marine mammal activities in SRKW critical habitat from vessel operations. **Moderate – injury**: With the implementation of sound attenuation devices, underwater noise from impact pile driving would exceed the temporary threshold shifts injury threshold for most hearing groups of marine mammals up to 858 m from the source.

Criteria	Assessment Rating	Rationale
Extent	Local and Beyond regional	**Local – injury**: Underwater noise disturbance in excess of the injury thresholds from pile driving would be local in extent, as the potential injury zone would be approximately 858 m for most marine mammals. **Beyond regional – behavioural disturbance**: Underwater noise in excess of behaviour thresholds would be beyond regional as it includes underwater noise from TMJ vessels in transit that may result in behavioural effects beyond the RAA/ MSAA.
Duration	Short-term	**Short-term**: During construction, underwater noise from pile driving, dredging and ground stabilization would be 36-90 days. Annual maintenance dredging would occur over a period of nine working days. Underwater noise from TMJ-related vessels would only be during the passing of the vessel in transit relative to the receptor, and during berthing/departing at the jetty. The anticipated transit time for an LNG carrier from the 12-nautical mile limit to Sand Heads is approximately 10 to 12 hours. A vessel traveling at 9 knots is estimated to require 1 to 2 hours to transit between the Sand Heads and the TMJ site; however, the transit time would vary depending on vessel type and speed.
Frequency	Infrequent, Frequent	**Infrequent – pile driving, dredging, ground stabilization:** Noise from these activities would occur infrequently during construction, and during operations for maintenance dredging. **Frequent – vessel operations:** There would be noise that exceeds behaviour effect thresholds for vessel operations (approximately one vessel call at the jetty every 2-3 days for the Application scenario to, on average, one vessel call to the jetty per day for the BVS), including vessels moving in the shipping lanes and berthing/departing at the jetty.
Reversibility	Irreversible and reversible	**Irreversible or reversible – injury**: Injury to marine mammals may be irreversible or fully reversible depending on the level of trauma incurred (that is, if a permanent threshold shift or temporary threshold shift was exceeded) **Reversible – behavioural disturbance:** Any behavioural changes are expected to be temporary in nature with individuals returning to habitat areas once the activities have ceased or becoming habituated to the noise.
Likelihood	High	There is a high level of likelihood of low residual effects to marine mammals from underwater noise due to TMJ.
Significance Determination	Not significant	Considering the above analysis and the EAO's recommended KMMs under CEAA 2012 for a Marine Mammal Management Plan and Vessel Traffic Management Plan, the EAO is satisfied that TMJ would not have significant adverse residual effects on marine mammals through underwater noise.
Confidence	Moderate to high	There is a moderate to high level of confidence in the likelihood and significance determinations based on the effectiveness of mitigation and compliance with the recommended KMMs under CEAA 2012. There is some uncertainty regarding the effectiveness in the use of bubble curtains due to uncertainty in the specific environmental conditions that would exist following the dredging. The ~1 km marine mammal safety zone is expected

Criteria	Assessment Rating	Rationale
		to be highly effective; however, it would be rendered less effective if the bubble curtains are not effective, as the mammal safety zone would then need to be larger and would be more difficult to monitor. There is also some uncertainty on the long-term behavioural effects of underwater noise on marine mammals (for example, effects on foraging).

Note: Criteria and assessment ratings are defined in Appendix 5: Residual Effects Characterization Definitions.

Table 18: Summary of Residual Effects on Marine Mammals Due to Vessel Strikes

Criteria	Assessment Rating	Rationale
Context	Low to Moderate Resilience	Species at risk in the RAA and MSAA, such as SRKW and harbour porpoise, would be more vulnerable at the population level and would have low resilience to any adverse effects. There are also species such as grey whales and humpback whales that have a higher susceptibility to vessel-strikes compared to other marine mammals due to their large size, slower travel and manoeuvring speeds, lower avoidance capability, and increased proportion of time they spend near the surface.
Magnitude	High	The LAA, RAA and MSAA contain federally-listed species, whose populations are vulnerable to the injury or loss of any individuals.
Extent	Regional	The effect would occur at the regional scale, within the RAA and MSAA.
Duration	Short-term to Permanent	Depending on the nature and severity of the injury, the effect would range from short- to medium-term for injury. It would be permanent for an individual death. Given the vulnerability of federally-listed species, in particular for SRKW, an injury or loss of any individual may lead to long-term consequences for populations.
Frequency	Infrequent	The residual effect of a vessel strike due to TMJ would be infrequent because it is expected to occur rarely (if ever) over the lifespan of the TMJ, the increase in vessel traffic over current conditions is small (0.2 percent to 1.1 percent depending on the segment in the MSAA; and ~1.5 % and ~4% in the original Application area for the Application scenario and BVS, respectively), and vessel strikes at the speeds proposed are rare.
Reversibility	Reversible and Irreversible	Depending on the nature of the injury, the effect could be reversible for minor injuries. It would be irreversible for major injury or death. Given the vulnerability of federally-listed species, in particular for SRKW, an injury or loss of any individual may lead to irreversible consequences for populations.
Likelihood	Low	There is a low likelihood that a vessel strike would occur, given the small increase in vessel traffic associated with TMJ, and mitigation measures, such as to slow vessels down (to a maximum speed of 10 knots in the Fraser River, when safe; and participating in the VFPA-led ECHO Program seasonal slowdown initiatives in the MSAA) and maintain minimum distances from marine mammals. The EAO notes that there may be increased likelihood of vessel strikes in areas of higher relative SRKW and vessel density; however, the overall likelihood is expected to remain low.

Criteria	Assessment Rating	Rationale
Significance Determination	Not significant	Considering the above analysis and the KMMs that the EAO is recommending under CEAA 2012 for a Vessel Traffic Management Plan, the EAO is satisfied that TMJ would not have significant adverse residual effects on marine mammals through vessel strikes.
Confidence	Moderate	There is moderate confidence in the likelihood and significance determinations based on the effectiveness of mitigation and compliance with the recommended KMMs under CEAA 2012, as there is scientific literature[83] demonstrating the effectiveness of vessel speed restrictions in reducing the likelihood of vessel-marine mammal collisions.

Note: Criteria and assessment ratings are defined in Appendix 5: Residual Effects Characterization Definitions.

The EAO considered the effect of TMJ on marine mammals from all potential effects including habitat loss, effects to prey, underwater noise and vessel strikes. The effect of a direct loss of habitat is predicted to be negligible, based on the location of the TMJ site (21 km from the mouth of the Fraser) and the overall amount of habitat potentially affected. Effects on marine mammals from changes in prey abundance and distribution were also considered negligible because overall effects of TMJ on fish and fish habitat were not significant. Considering the characterization of residual effects due to underwater noise and vessel strikes on marine mammals in combination with the above effects and having regard to the KMMs that the EAO is recommending under CEAA 2012 for a Marine Mammal Management Plan and Vessel Traffic Management Plan, the EAO predicts that there would still be residual effects from TMJ on marine mammals after the implementation of mitigations, however, the EAO is satisfied that these effects would not be significant from TMJ alone.

5.7.5 CUMULATIVE EFFECTS ASSESSMENT

The Application included a cumulative effects assessment of the combined residual effects that TMJ, existing projects and reasonably foreseeable future projects could have on marine mammals. Cumulative effects on marine mammals could occur if there is a spatial and/ or temporal overlap of past, present and reasonably foreseeable projects.

[83] Dolman, S., Williams-Grey, V., Asmutis-Silva, R., & Isaac, S. (2006). Vessel collisions and cetaceans: What happens when they don't miss the boat. Whale and Dolphin Conservation Society.
Jensen, A. S., & Silber, G. K. (2003). *Large Whale Ship Strike Database. U. S. Department of Commerce* (p. 37). NOAA Technical Memorandum. NMFS-ORP.
Kite-Powell, H. L., Knowlton, A., & Brown, M. (2007). *Modeling the effect of vessel speed on Right Whale ship strike risk* (p. 8). NA04NMF47202394. National Oceanic and Atmospheric Administration and National Marine Fisheries Service.
Vanderlaan, A. S. M., & Taggart, C. T. (2007). Vessel Collisions with Whales: The Probability of Lethal Injury Based on Vessel Speed. *Marine Mammal Science*, *23*(1), 144–156.

TJLP determined that the following reasonably foreseeable future projects and activities in the RAA (Jetty to Sand Heads) could interact cumulatively with TMJ to affect marine mammals:

- PBRP (9 km upstream) – potential spatial and temporal overlap of marine shipping activities in the marine mammal RAA; and
- VAFFC (1.3km downstream) – overlaps with the TMJ marine mammal RAA, and marine shipping activities during construction and operations of this project spatially and temporally overlap with the TMJ marine mammal RAA.

TJLP noted the following other projects in the RAA that could potentially interact with TMJ due to additional vessels but stated that there was insufficient information about the project or certainty that the project would proceed to include it in a cumulative effects assessment for marine mammals: Seaspan Ferries Tilbury Terminal Expansion, Fraser River Tunnel Project, Deas Island BC Hydro Transmission Line. The EAO notes that the Delta Grinding Facility and FortisBC Tilbury Phase 2 LNG Plant Expansion could potentially interact with TMJ due to additional vessels; however, there is uncertainty about the potential temporal overlap. As proposed, the Delta Grinding Facility would include approximately 30 Panamax class vessel movements a year and the FortisBC Tilbury Phase 2 LNG Plant Expansion is expected to have a minor increase marine shipping traffic during construction (up to three years) as part of the temporary construction jetty and delivery of project equipment modules.

For the MSAA, a complete list of existing and reasonably foreseeable projects considered is provided in the MSA (Table 2.0-6). All projects and activities with a marine shipping or vessel activity component were considered to interact with residual effects with marine mammals. TMJ is expected to increase shipping in the MSAA by 118 TMJ vessels annually (236 vessel movements annually with required tug escorts). TJLP predicted total future cumulative vessel movements in the MSAA by considering TMJ, the projects in the MSA (Table 2.0-6) and a projected vessel traffic growth rate.

INJURY FROM UNDERWATER NOISE

In the Fraser River, impact pile driving from both the PBRP and VAFFC have the potential to interact cumulatively with TMJ. TJLP noted that construction for VAFFC was already underway at the time the Application was written and should be completed prior to construction of TMJ. Therefore, there would be no temporal overlap between underwater noise from pile driving. Construction for the PBRP could overlap temporally with TMJ. However, it is located 9 km upstream from TMJ, and therefore is farther than the most conservative estimate for the distance of injury threshold attenuation from pile driving (6.2 km) from TMJ. Despite the unlikely interaction between the bridge replacement and TMJ, the Application still noted that there was a chance they could interact cumulatively.

BEHAVIOURAL DISTURBANCE FROM UNDERWATER NOISE

In the RAA, TJLP predicted a potential residual cumulative effect to behavioural disturbance from underwater noise from the interaction between TMJ, VAFFC and the PBRP vessels during construction and operations. Once operational, VAFFC would receive one barge of fuel every two weeks and one Panamax class vessel per month. PBRP would require three vessels per week in the area during construction and a higher number of barges and tugboats over a 15-day period to decommission the existing Pattullo Bridge. TJLP explained that almost all ocean-going vessels generate underwater noise that exceeds the disturbance thresholds for marine mammals at close range. TJLP assumed that the potential disturbance zone radii associated with vessels from these projects would be similar to those modelled for TMJ. Therefore, when any vessels occur close together in space and time there would be an overlapping of the "behavioural disturbance zone" radii from each vessel and a cumulative behavioural disturbance effect could occur. This could increase the duration of noise exposure for an individual animal, in addition to increasing the number of individuals potentially affected. TJLP noted that predicted acoustic frequencies emitted by TMJ, VAFFC and PBRP vessels would be more likely to overlap with the hearing range of baleen whales and pinnipeds than with toothed whales.

In the MSAA, TJLP predicted that cumulative underwater sound activities are expected to exceed established underwater sound behavioral disturbance criteria and cause masking of important marine mammal and echolocation. Behavioral responses have the potential to be significant to the population due to the almost continuous nature of cumulative vessel activity in the MSAA, especially in critical habitat areas for SRKW. Reductions in foraging opportunities due to masking of echolocation signals is likely to act synergistically with other threats to the SRKW population identified in the Recovery Strategy for SRKW (for example, reduced prey availability due to low abundance of chinook salmon, contaminant levels, vessel disturbance and underwater noise pollution). TJLP noted it is likely that large vessels are causing the majority of behavioral responses in SRKW while smaller vessels contribute more significantly to the masking of echolocation clicks. The likelihood of these effects occurring from cumulative underwater sound sources is considered high. TJLP concluded that the existing baseline conditions and other reasonably foreseeable projects and vessel activity are currently significantly affecting behavioral disturbance and masking of important vocalizations to SRKW.

TJLP concluded it is considered unlikely that behavioral responses from humpback whales would be significant to the population due to their low densities in the MSAA and preference for areas along the continental shelf. Masking effects could occur, however, the effects of masking of humpback whale vocalizations in the MSAA are not well understood. TJLP concluded that due to their continued recovery and population growth, the cumulative effects of behavioral disturbance and masking in North Pacific humpback whales are not expected to be significant.

TJLP concluded that cumulative underwater sound activities are expected to exceed established underwater sound behavioral disturbance criteria for Steller sea lions. There is a high likelihood for underwater sound generated from cumulative sources to result in some level of behavioral disturbances. Due to the transient nature of underwater sound associated with vessel movements, high severity or significant behavioral responses are not anticipated. TJLP concluded that due to their continued recovery and population growth, the cumulative effects of behavioral disturbance to Steller sea lions are not expected to exceed the resilience and adaptability limits of the population, and therefore the residual cumulative effect is considered negligible and not significant.

INJURY/ MORTALITY FROM VESSEL STRIKES

In the RAA, TJLP stated that vessel movements from the VAFFC and PBRP could cause a cumulative effect with TMJ on vessel-marine mammal interactions (injury and/ or mortality). TJLP noted that this risk was highest for baleen whales, such as grey and humpback whales, due to their larger size, slower speeds and preferred foraging behaviour in surface waters. In the MSAA, the western Strait of Juan de Fuca is considered a high-risk area for vessel collisions with humpback whales. As most of the vessels transiting in this area would be large vessels (>80 m) and are likely operating at speeds of ≥16 knots, beyond both the critical thresholds for a collision probability (>13 knots) and lethality (>9 knots), the effect of vessel strikes on humpback whales due to cumulative vessel activity was carried forward in the cumulative effects assessment.

The potential effect of a vessel strike on north pacific humpback whales was considered moderate in magnitude as a strike could lead to the death or injury from a population listed as Special Concern under SARA. TMJ vessels would continue beyond the MSAA and therefore potential effects associated with vessel strikes would continue beyond the 12-nautical mile limit through the western Juan de Fuca Strait, an area considered high risk for collisions with humpback whales. The likelihood of the effect is considered high due to the estimated vessel speeds (≥16 knots) and overlap of the shipping route with a high-risk collision area. DFO considered the relative risk of vessel strikes to the humpback whale population to be moderate for an individual but low for the overall population. Due to the continued state of growth of this population (4 percent to 7 percent), TJLP concluded that the cumulative residual effect would be not significant to baleen whales because the effects of cumulative vessel strikes are not expected to exceed the resilience and adaptability limits of the population.

Toothed whales, such as SRKW, could also be affected. SRKW have a particularly low resilience due to the small population. TJLP consider SRKW and other toothed whales to be at relatively low risk of vessel strikes due their speed and agility and sensitive underwater hearing abilities. To effectively avoid vessel strikes on SRKW, TJLP committed to incorporating contractual measures to support participation of TMJ-related vessels in the VFPA-led ECHO Program seasonal slowdown initiatives. The seasonal slowdown initiatives currently take place in key

SRKW foraging areas such as Haro Strait, Boundary Pass and Swiftsure Banks. In these slowdown areas, the ECHO's requests bulk carriers, tankers and general cargo vessels to slow down to 11 knots speed through water and requests containers, car carriers and cruise vessels to slow down to 14.5 knots speed through water. Based on the limited number of SRKWs reportedly struck by vessel traffic despite their continued presence in high-traffic areas within the MSAA, their physiological attributes (echolocation to detect ships at a distance), and the implementation of mitigation measures, TJLP concluded the cumulative residual effect is considered not significant.

TJLP concluded that the BVS did not change TJLP's conclusions on cumulative residual effects.

5.7.5.1 ISSUES IDENTIFIED DURING APPLICATION REVIEW

Maa-nulth First Nations, Esquimalt First Nation, Scia'new (Beecher Bay) First Nation, Pauquachin First Nation, Esquimalt First Nation, Tsawwassen First Nation and Tsleil-Waututh Nation raised concerns regarding cumulative effects to marine mammals from marine shipping activities.

Maa-nulth First Nations noted in their submissions in the TMX and RBT2 EAs, and for TMJ, that Maa-nulth First Nations are very concerned regarding the cumulative effects of development on the health of the ocean and that the collapsing steelhead, chinook and SRKW populations are signs of an imbalance in the marine environment.

Tsawwassen First Nation requested TJLP acknowledge the DFO conclusion concerning the cumulative threats that significant adverse effects pose, not only to individual SRKWs, but the future viability of the entire population and its possible status as endangered, or worse, extinct in the event that current efforts to mitigate adverse effects are unsuccessful.

Tsleil-Waututh Nation expressed concerns that cumulative missed feeding opportunities and potential hearing impairment for SRKW could result in the mortality of an individual, which could have cascading population-level effects. Tsleil-Waututh Nation recommended that TJLP partner with TC and DFO to establish thresholds and management objectives for SRKW; assess TMJ's environmental effects against the thresholds and management objectives; and establish adaptive management strategies to ensure TMJ-related environmental effects are compliant with management objectives that promote SRKW survival and recovery.

TJLP outlined their acoustic modelling which concluded that TMJ would not exceed thresholds for pain/ injury to marine mammals in the MSAA. TJLP noted that TMJ-related shipping could result in SRKW behavioral responses that are likely to range from no reaction to minor alterations in swimming speed and/ or minor or moderate individual or group avoidance of the sound source. With consideration for voluntary vessel slowdowns, TJLP anticipates that TMJ-related effects of behavioural disturbance and masking on SRKWs to be minor relative to

existing conditions, and therefore, are not expected to contribute to the decline of the population.

Maa-nulth First Nations, Tsawwassen First Nation and Tsleil-Waututh Nation raised concerns about the high uncertainty in the cumulative effects assessment and the effectiveness of the mitigation measures.

DFO agreed with TJLP's cumulative assessment in general but noted there remains considerable uncertainty about how the cumulative effects of these residual effects would affect the recovery or resilience of marine mammal populations.

The EAO acknowledges there is some uncertainty in the behavioural response of SRKW to underwater noise; however, conservative thresholds and the best available science have been considered in the assessment. During the EA, the EAO sought input from the Working Group and Indigenous Groups on the sufficiency and effectiveness of the mitigation measures proposed in the Application. The EAO has recommended a number of mitigation measures proposed in the Application and during the EA as KMMs under CEAA 2012 as part of the Vessel Traffic Management Plan. The plans and mitigations would also be required to be developed in consultation with a number of agencies and Indigenous Groups. To support the effectiveness of these measures, these plans would include a number of specific mitigation measures, monitoring requirements.

5.7.5.2 REGIONAL INITIATIVES FOR ADDRESSING CUMULATIVE EFFECTS TO MARINE MAMMALS

The federal government's Oceans Protection Plan (OPP) includes initiatives aimed at protecting Canada's coasts, including a state-of-the art marine safety system, preservation and restoration of marine ecosystems, building Indigenous partnerships, creating a stronger evidence base and increasing community participation and public awareness. The Whales Initiative (in place until 2023), as well as additional management measures targeted to support the protection and recovery of SRKW (in place until 2024) builds on measures of the OPP and aims to address imminent threats to SRKW, by improving prey availability, reducing disturbances from underwater vessel noise, enhancing monitoring under the water and in the air, encouraging compliance, strengthening enforcement and building partnerships for additional action to protect SRKW. A variety of regulatory, research, monitoring and mitigation activities associated with the protection of SRKW are either planned or ongoing. Recent regulatory measures implemented by the federal Government of Canada to help support the recovery of SRKW by abating threats include: seasonal area-based salmon fishing closures in key foraging areas for SRKW, establishing three Interim Sanctuary Zones, updating the *Marine Mammal Regulations* with larger approach distances (200 m), and further increasing the vessel approach distances in the SRKW's range on an interim basis (400 m). The federal government has also increased monitoring of contaminants, supported international technical workshops, provided funding to

promote measures to protect SRKW, and increased the number of fishery officers to verify compliance with fisheries management measures and the Marine Mammal Regulations.

TC is also undertaking a study to assess the feasibility of modifying the Traffic Separation Scheme in SRKW critical habitat to reduce the proximity of the shipping lanes to important areas for SRKW. Should modifications be determined to be feasible and safe, and a benefit for SRKW overall without increasing effects on other species and Indigenous rights, any potential changes would require binational cooperation with the U.S. and an eventual submission to the IMO. The study is focusing on key areas of importance located in the Strait of Juan de Fuca and at Swiftsure Bank, Haro Strait/ Boundary Pass and the Strait of Georgia near the mouth of the Fraser River.

The federal government has also worked with and supported the Vancouver Fraser Port Authority-led ECHO Program to implement voluntary measures to reduce threats to SRKW from large commercial vessels. The VFPA's ECHO Program aims to better understand and reduce cumulative effects of shipping activities on at-risk whales throughout the southern coast of B.C. Since 2014, the ECHO Program has worked to better understand and reduce acoustic effects of large commercial vessels in key foraging areas in SRKW critical habitat through a range of projects, educational initiatives, incentive programs and voluntary research trials, including implementing and evaluating the effectiveness of the voluntary vessel slow down initiatives in Haro Strait, Boundary Pass and Swiftsure Bank and the voluntary inshore lateral displacement initiative for tugboat operators in the Strait of Juan de Fuca. The Canadian Coast Guard (CCG) through its Marine Communications and Traffic Services (MCTS) centres, will continue to support the ECHO Program by informing mariners of voluntary slowdown areas and lateral displacement initiatives. Through the Whales Initiative, an additional position within MCTS has been created to support maritime domain awareness with an additional focus on the communication of marine mammal presence to mariners.

The EAO's analysis and conclusions on cumulative effects and their significance have considered the proposed mitigation measures identified in the Application and the MSA and over the course of the EA, as well as Government of Canada initiatives as important context for understanding regional cumulative effects.

5.7.5.3 THE EAO'S CONCLUSIONS ON CUMULATIVE EFFECTS

The EAO notes that several federal regional initiatives are underway whose goals are to collect habitat and monitoring information, implement management measures to address cumulative effects in the Salish Sea, including (as described in Section 5.7.5.2) the OPP initiatives, the Whales Initiative, and the ECHO Program. TMX Accommodation Initiatives, such as the Salish Sea Initiative and Quiet Vessel Initiative are working towards a better understanding of cumulative effects in the Salish Sea as well as taking actions to address cumulative effects, and

are therefore considered relevant by the EAO as important context for understanding regional cumulative effects.

The EAO considered the interaction between injury-causing noise sources that could temporally or spatially overlap with TMJ residual effects for the Application scenario and BVS. The EAO concludes that with the implementation of proposed mitigation measures, including sound attenuation devices at the TMJ site and marine mammal monitoring in the zone of potential injury, there would be a low likelihood of temporal or spatial overlap between TMJ and the above two projects (PBRP and VAFFC) in the Fraser River in terms of injury to marine mammals from underwater noise. The EAO has a high level of confidence that any potential residual cumulative effects to marine mammals from injury due to underwater noise from pile driving would not be significant.

The EAO concludes there is an existing significant adverse cumulative effect on SRKW due to their endangered status under SARA and significant risks to the recovery of this population, and cumulative underwater sound activities from marine shipping that are expected to exceed established underwater sound behavioural disturbance criteria. Although the EAO concludes that the residual effects from TMJ alone would not be significant (for either the Application scenario or BVS), considering the residual effects from TMJ in combination with other past, present and reasonably foreseeable projects, the cumulative effects on SRKW due to underwater noise would be significant. This cumulative effect would be non-significant for the other marine mammal species.

The EAO is recommending KMMs under CEAA 2012 to develop a Marine Mammal Management Plan with mitigation measures to reduce underwater noise effects at the TMJ site and a Vessel Traffic Management Plan with vessel speed provisions to reduce underwater noise from TMJ vessels in transit. The EAO is recommending a KMM under CEAA 2012 that would require TMJ to identify their participation, where possible, in the identification and implementation of regional environmental/ vessel management measures to protect SRKW, such as the federal Oceans Protection Plan and the federal Whales Initiative, and to report on this annually.

The EAO concludes that there would be residual, non-significant, cumulative effects (for both the Application scenario and BVS) with respect to injury and/ or mortality as a result of effects of TMJ interacting with effects of other past, present and reasonably foreseeable future projects and activities. The likelihood of vessel strike is higher in areas of higher relative SRKW and vessel density when cumulative increase of ship traffic due to other planned projects are considered. This effect would be high magnitude due to the risk of mortality to individuals of species at risk, but unlikely to occur given the proposed mitigation measures, as presented in Section 5.7.2.3 and regional initiatives described in Section 5.7.5.2.

The EAO is aware that TJLP has committed to contribute up to $2 million to the FNFLF[84], which is a program led by several Indigenous Groups that supports recovery programs for chinook salmon, eulachon and sturgeon in the Fraser River and Salish Sea. In the proposal, TJLP noted that an important factor underlying the current state of SRKW is the state of chinook salmon, upon which SRKW rely for a substantial portion of their diet. For more information about the EAO's consideration of TJLP's contribution proposal, refer to Section 13.1 on Current Context and Cumulative Effects in Part C.

5.7.6 CONCLUSIONS

Considering the above analysis and having regard to the mitigation measures identified in the Application including the EAO's recommendations for KMMs under CEAA 2012 (Appendix 1), including Marine Mammal Management Plan and Vessel Traffic Management Plan, the EAO is satisfied that TMJ would not have significant adverse residual effects on marine mammals from underwater noise or vessel strikes.

The EAO concludes that the predicted residual effects from TMJ interacting with existing baseline conditions (which include existing threats to the SRKW population), existing projects and other reasonably foreseeable future projects would contribute to significant adverse cumulative effects on SRKW due to underwater noise.

5.8 VEGETATION

5.8.1 BACKGROUND

Vegetation was selected as a VC for TMJ because there are plant species of particular importance to provincial and federal regulators, Indigenous Groups, and the public, and TMJ has the potential to adversely affect the availability and/ or quality of those plant species due to activities associated with TMJ construction, operations, and decommissioning.

The Vegetation VC is linked to the following VCs: River Processes (Section 5.3), Vessel Wake (Section 5.4), Water Quality (Section 5.5), Fish and Fish Habitat (Section 5.6), and Wildlife and Wildlife Habitat (Section 5.9). The Vegetation assessment supports the assessment of TMJ's effects on the Land and Marine Resource Use VC, Current Use VC, and Wildlife and Wildlife Habitat VC, as well as Part C of this Report.

[84] TJLP's proposal for Unconventional Offsetting Accommodation for Residual Project and Cumulative Effects, dated July 5, 2021 (https://www.projects.eao.gov.bc.ca/api/document/61099898cd98620022b0832b/fetch/20210707_TilburyJettyLimitedPartnership_UnconventionalOffsetProposal.pdf).

The Vegetation assessment was based on three sub-components and indicators:

- Plant species of management concern – plant species at-risk distribution, traditional use plant distribution, and invasive plant distribution;
- Terrestrial ecosystems – terrestrial ecosystem presence and distribution; and
- Wetland and riparian ecosystems – wetland and riparian ecosystem presence and distribution.

For the EAO's assessment of potential effects of dredgeate disposal to the Vegetation VC, refer to Section 2.2.5 (Alternative Means of Undertaking the Project) in Part A of this Report. TJLP did not include the Vegetation VC in the MSA because vegetation is not expected to occur within the spatial boundaries of the MSA (inbound and outbound shipping lanes that occur between Sand Heads and the 12 nm limit) or be adversely affected by TMJ shipping. TMJ-related vessel wake is expected to be within the natural variation of the wave heights at the shoreline (see Section 5.4, Vessel Wake) and therefore is not expected to affect vegetation along the shoreline.

5.8.1.1 REGULATORY CONTEXT

Some plant species are protected under the federal SARA and others indirectly under the *Migratory Birds Convention Act*. Changes potentially affecting vegetation are linked to sections 5(1)(a), 5(1)(b)(i), 5(1)(c)(iii), and 5(2)(a) of the CEAA 2012. Changes potentially affecting riparian ecosystems or wetlands are also linked to fish and fish habitat under the *Fisheries Act*. *The Federal Policy on Wetland Conservation* (1991) (Policy) commits "all federal departments to the goal of no net loss of wetland functions (i) on federal lands and waters, (ii) in areas affected by the implementation of federal programs where the continuing loss or degradation of wetlands has reached critical levels, and (iii) where federal activities affect wetlands designated as ecologically or socio-economically important to a region. Due to local circumstances where wetland losses have been severe, in some areas no further loss of any remaining wetland area may be deemed essential."

Under the B.C. *Weed Control Act*, noxious weeds growing or located on land and project premises must be controlled. The provincial *Water Sustainability Act* also provides protection of riparian ecosystems and wetlands. The Environmental Protection and Management Regulation may apply to portions of the foreshore administered by the Province. B.C.'s Environmental Mitigation Policy applies to provincial lands and includes a mitigation hierarchy approach that prioritizes preventing or avoiding harm over managing its consequences. The preferred order of addressing potential adverse effects to values and associated components is 1) Avoid effects; 2) Minimize adverse effects; 3) Restoration where effects have occurred; and 4) Offset residual adverse effects.

5.8.1.2 BOUNDARIES

Five spatial boundaries were used in the assessment (Figure 7):

- Project Disturbance Footprint: all terrestrial and submerged lands subject to direct disturbance (except the Dredge Area), as well as a 1 m buffer surrounding the disturbance;
- TMJ Site includes the onshore and offshore portions of TMJ;
- LAA: the Project Disturbance Footprint plus a 100 m buffer area;
- RAA: the LAA, and South Arm of the Fraser River from the TMJ Site boundary downstream to Sand Heads, including a 50 m buffer from the high-water mark on either side; and
- Technical Study Area: encompasses terrestrial portions of the TMJ site and the LAA located on Tilbury Island. It also extends southwest in the RAA along the north side of Tilbury Island, and encompasses vegetated habitat outside of the RAA, along the south side of Tilbury Island.

5.8.2 POTENTIAL PROJECT EFFECTS AND PROPOSED MITIGATION MEASURES IN THE APPLICATION

5.8.2.1 BASELINE INFORMATION

The Fraser River shoreline in the LAA consists of mud flat with several small surface channels that drain marsh and riparian areas, all of which have been heavily modified and fragmented by historical activities. Tilbury Island and the LAA are currently dominated by industrial activities, and historical activities have altered the upland environment. The LAA is comprised of 4.3 ha (5.4 percent) of various wetland types. TJLP conducted a wetland functional assessment in the LAA and determined that wetlands in the Project Disturbance Footprint provided low functional performance due to historical anthropogenic disturbances[85]. The Project Disturbance Footprint overlaps a single marsh area, comprised of three Sensitive Ecosystem Inventory (SEI) wetland types[86] Please refer to Section 5.5, Water Quality, for further details about water and sediment quality. Terrestrial ecosystems in the LAA consist of anthropogenic land cover types such as barren fields and horticultural plantings. The terrestrial portions of the LAA are maintained as lawn or covered with asphalt, compacted gravel, and infrastructure, and no longer have natural site characteristics. Terrestrial ecosystems were not considered further in the assessment.

[85] Assessment of the ecological, hydrological, biochemical, and habitat function.

[86] Wetland classes in the Sensitive Ecosystem Inventory which encompasses ecosystems at risk as well as rare and ecologically fragile ecosystems that are ecologically important because of the diversity of species they support.

PLANT SPECIES OF MANAGEMENT CONCERN

Based on the B.C. CDC Species and Ecosystem Explorer website, eight red-listed and 16 blue-listed plant species at risk have the potential to occur in the LAA. B.C. CDC data indicated occurrences of streambank lupine (provincially red-listed and federally listed as Endangered), Vancouver Island beggarticks (provincially blue-listed and federally listed as Special Concern), and provincially blue-listed three-flowered waterwort were recorded on Tilbury Island outside of the LAA (in the RAA). During 2015 plant species at risk field surveys conducted for TMJ, no species at risk were identified in the LAA. No marine plants, as defined in the SARA, were identified during TMJ's baseline studies.

In terms of traditional use plants, of the 50 plant taxa encountered during field surveys in the LAA, 20 species were identified as potential traditional use plants, mainly deciduous shrubs or forbs (herbs) and some trees, ferns and grasses. These plants were unevenly distributed and were more common in the less disturbed portions of the LAA. Although traditional use plant collecting areas were not identified on Tilbury Island in Traditional Use Studies (TUS) provided by Indigenous Groups, potential traditional use plants are present on Tilbury Island. No traditional use plants were observed in the Project Disturbance Footprint.

In the LAA, habitats are highly disturbed, invasive plant species[87] are prevalent, and noxious species[88] are present. During 2015 field surveys conducted for TMJ, seven invasive, five noxious, and six exotic species were observed in the Technical Study Area. Himalayan blackberry was the only invasive plant and Japanese knotweed was the only noxious plant observed in the TMJ site.

[87] As listed under the B.C. Weed Control Regulation under the *Weed Control Act* (1996) and B.C.'s Proposed Prohibited Noxious Weeds list.

[88] Ibid.

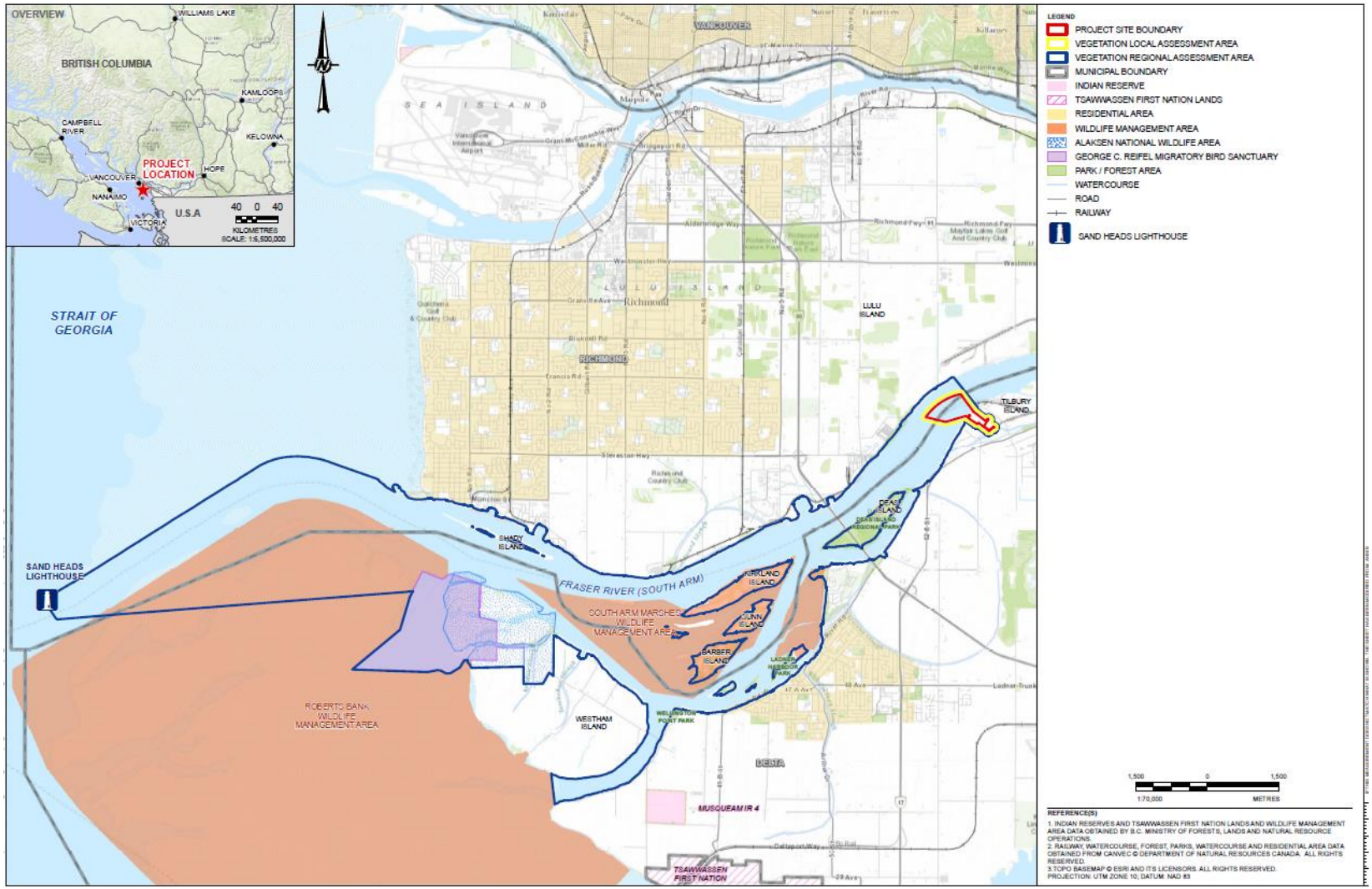

Figure 7: Vegetation Local and Regional Assessment Area.

5.8.2.2 POTENTIAL PROJECT EFFECTS

LOSS OF SPECIES OF MANAGEMENT CONCERN

During construction, site preparation and ground stabilization could result in direct loss of plant species at risk and traditional use plants. Although plant species at risk and traditional use plants were not observed within the Project Disturbance Area, baseline field surveys cannot determine their complete absence. In the Application, TJLP stated that a pre-construction survey of the Project Disturbance Footprint would be conducted to identify plant species at risk and traditional use plants prior to the initiation of construction. Methods to protect, salvage and transplant those plants would be outlined in the Vegetation Management Plan and Wetland Mitigation Plan. TJLP expected the wetland and riparian enhancement and creation, to be conducted during construction, to expand the available habitat for these species. Wetland and riparian enhancement is planned to occur primarily within the TMJ Site, but it would extend into the LAA. Given the implementation of mitigation measures, TJLP concluded that the magnitude of the predicted residual effect would be negligible.

INTRODUCTION AND EXTENT EXPANSION OF INVASIVE SPECIES

TMJ activities during construction and decommissioning, such as transportation of equipment and material to the TMJ site from off site, and activities that disturb soil and vegetation, may result in the introduction and proliferation of invasive plant species. In the Application, TJLP noted that natural ecosystems in the LAA currently exist with the imposed stress of invasive plant species. TJLP expects to reduce the distribution of invasive plants through invasive plant species management planning and habitat restoration. With the application of standard construction mitigation practices, applicable BMPs, and an Invasive Plant Species Management Plan, TJLP concluded that the magnitude of the predicted residual effect would be negligible.

DIRECT LOSS OF WETLAND AND RIPARIAN ECOSYSTEMS

During construction, site clearing, ground disturbance, other site preparation activities, and onshore and offshore construction are expected to result in the direct loss of 0.23 ha of wetland and riparian ecosystems (Table 19). TJLP predicted negligible habitat loss due to decommissioning because areas affected by the removal of piles would be restored to the state of surrounding habitat. The methods of pile removal and restoration during decommissioning would be detailed in a decommissioning plan. This plan would be a requirement for BC OGC Commission permitting and would be drafted closer to decommissioning to capture current technologies and best practices.

Table 19: Direct Loss of Wetland and Riparian Ecosystems in the Project Disturbance Footprint during Construction

SEI Wetland Class and Subclass	Areas of ecosystems loss in Project Disturbance Footprint (ha)	Proportion of total area of the ecosystem type in the LAA (%)	Proportion of the total area of the ecosystem type in the RAA (%)
Estuarine marsh	0.08	11.6	0.01
Riparian mudflat	0.1	24.5	0.76
Riparian fringe	0.05	14.8	0.08
Total potential loss	*0.23*	*15.3*	*0.03*

TJLP stated that TMJ design has integrated features that would minimize loss of these ecosystem types, and that offsetting[89] through wetland enhancement and creation during construction would result in an overall gain of 0.95 ha of wetland ecosystems in the LAA (Table 20). This wetland enhancement and creation is the same area proposed for the offsetting for the federal *Fisheries Act* authorization.

Table 20: Wetland Offsetting – Enhancement and Creation during TMJ Construction

Project Phase	Offsetting	Wetland Type	Area (ha)	Study Area
Construction (Year 2)	Enhancement	Riparian fringe	0.23	LAA foreshore
Construction (Year 2)	Enhancement	Estuarine marsh	0.32	LAA foreshore
Construction (Year 3)	Enhancement	Riparian mudflat	0.31	LAA foreshore
Construction (Year 2)	Creation	Estuarine marsh	0.32	LAA foreshore
Total			*1.18*	*LAA foreshore*

TJLP would salvage plants from wetlands affected by construction and translocate them to wetland offsetting sites. TJLP considers that wetland offsetting sites would be partially functional immediately. TJLP expects the wetland enhancement and creation to provide increased hydrological, biochemical, ecological, and habitat functions to wetlands currently in the LAA, and increased ecological function is expected within three years, based on similar wetland restoration projects in the south Fraser Arm. To determine the success of wetland offsetting, TJLP proposed a monitoring program be initiated after enhancement and creation of the wetlands to assess biological, hydrological, and structural characteristics of the wetlands. After performance standards have been achieved, TJLP proposed long-term monitoring and

[89] Note: TJLP's proposed offsetting through wetland enhancement and creation is for both fish and wetlands.

adaptive management would be implemented to ensure the success of the wetland offsetting. With the proposed wetland enhancement and creation, TJLP concluded that residual effects related to the loss of wetland and riparian ecosystems would be negligible.

INDIRECT LOSS OF WETLAND AND RIPARIAN ECOSYSTEMS

Construction and decommissioning activities, such as site preparation, land-based ground stabilization, and piling works, for onshore facilities may have indirect effects on wetland and riparian ecosystems through surface runoff and deposition of fugitive dust. Surface runoff from disturbed areas (such as, exposed soil) can contain suspended solids that may affect soil quality and vegetation and localized dust can coat vegetation leading to reduced growth and vigour. Standard mitigation practices outlined in the Construction Environmental Management Plan (CEMP) and Operational Environmental Management Plan (OEMP), along with an Erosion and Sediment Control Plan (ESCP) and a Decommissioning and Final Rehabilitation Plan, would be applied during construction and decommissioning to prevent or minimize indirect loss of wetland and riparian ecosystems. Based on the wetland enhancement and creation proposed, TJLP concluded that residual effects related to the indirect loss of wetland and riparian ecosystems would be negligible.

Ground stabilization for offshore and onshore facilities during construction may indirectly affect wetland and riparian ecosystems by altering localized hydrology and river processes. TJLP stated that stabilization activities would take place at or below the sediment surface; therefore, surface flows would be maintained and minor impediments to hydrological input from groundwater sources are not expected to affect wetland and riparian ecosystems outside of the Project Disturbance Footprint. In addition, TJLP does not expect in-river structures to alter river processes (such as sedimentation and scour) beyond the natural range of variation for existing river characteristics (Refer to Section 5.3, River Processes). Given that loss of ecosystems in the Project Disturbance Footprint has been accounted for as direct loss, TJLP does not expect additional indirect effects from hydrological changes.

BUNKER VESSEL SCENARIO

For the BVSA, TJLP considered the effects on scour (as described in River Processes, Section 5.3.3) on Vegetation. TJLP concluded that the proposed increased annual bunker activity would not result in changes in the effects or characterization of effects to River Processes, as such no change to Vegetation is predicted. The increase in annual bunker vessels is predicted to have a negligible effect on Vegetation, and the residual effect conclusions in the Application for Vegetation are expected to remain unchanged.

5.8.2.3 MITIGATION MEASURES PROPOSED IN THE APPLICATION

The Application proposed the following mitigation measures to reduce the effects of TMJ on the Vegetation VC:

- Limit vegetation clearing using measures to preserve native trees and vegetation;
- Conduct pre-construction surveys for plant species of management concern (including species at risk and traditional use plants);
- *Construction Environmental Management Plan (CEMP)*: Identify sensitive areas to be flagged and vegetation and soils to be retained or salvaged with required methods and monitoring;
- *Vegetation Management Plan*: Guidance for the protection and salvage of vegetation including terrestrial ecosystems, wetland ecosystems, and plant species of management concern (species at risk and traditional use plants). It will also provide site-specific information on mitigation measures, monitoring activities and adaptive management. Under the provincial *Weed Control Act*, TJLP is required to control noxious weed populations at the TMJ site. The plan would also include invasive plant control procedure to mitigate the introduction, transportation and proliferation of invasive plants species;
- *Erosion and Sediment Control Plan*: Identify where erosion and sediment control measures should be implemented during construction, operational constraints (for example, stop sensitive works in heavy rains), and effectiveness monitoring;
- *Wetland Mitigation Plan*: To offset unavoidable loss of vegetation and ecosystems in the Project Disturbance footprint through enhancement and creation of wetland and riparian ecosystem. It would also describe salvaging and transplanting techniques for any plant species at risk and traditional use species identified during pre-construction surveys;
- *Operational Environmental Management Plan*: Identify methods to be used during operation to avoid or reduce effects to vegetation during operations, including erosion and sediment control, and vegetation management;
- *Decommissioning Environmental Management Plan***:** Identify methods to be used during decommissioning to reduce potential effects on the environment, including invasive species management; and
- *Decommissioning and Final Rehabilitation Plan*: Following the most current BMPs, regulations, and standards at the time of decommissioning and developed in consultation with applicable regulatory authorities and local Indigenous Groups prior to TMJ no longer being operational.

No additional mitigation measures were proposed by TJLP as part of the BVSA.

5.8.3 POTENTIAL PROJECT EFFECTS AND PROPOSED MITIGATIONS IDENTIFIED DURING APPLICATION REVIEW

The following key issues related to the assessment of Vegetation for TMJ were identified during Application review and based on feedback from the Working Group:

- Wetland and riparian ecosystems loss and offsetting; and
- Indirect effects to wetland and riparian ecosystems.

WETLAND AND RIPARIAN ECOSYSTEMS LOSS AND OFFSETTING

ECCC, DFO, Musqueam Indian Band, Tsleil-Waututh Nation and Tsawwassen First Nation expressed concerns about: loss of plants species of management concern; uncertainty when developing and implementing offsetting measures, including design or implementation failure; longer time lags than predicted before created offsetting measures become functional; and monitoring and follow-up plans.

> In response, TJLP stated that the Vegetation Management Plan would include pre-construction surveys to be conducted for plant species of management concern, including species at risk and traditional use plants. The surveys would incorporate Traditional Environmental Knowledge (TEK) and Traditional Use (TU) and salvage protocols for traditional use plants. Indigenous Groups would be invited to participate in the pre-construction surveys and in developing the salvage protocols.
>
> TJLP confirmed that the Wetland Mitigation Plan would include the monitoring protocols and the performance standards that would be used to determine a successful trajectory for wetland enhancement and creation, long-term monitoring and adaptive management. The performance standards would be used for early detection if wetland enhancement or creation areas are not on track to meet objectives. Early detection would enable the implementation of adaptive management to meet the performance standards for wetland enhancement and creation areas. The Wetland Mitigation Plan would provide details on methods for plant salvage and sod transplanting, including translocation areas that contain suitable attributes to promote plant survival. Methods for monitoring translocated plants and "control" plants would be included in the monitoring plan that would be described in the Wetland Mitigation Plan. Indigenous Groups would be invited to participate in the monitoring of wetland enhancement and creation areas.

The EAO is proposing Condition 18: Vegetation and Wetland Management and Wetland Offsetting Plan. The condition would include vegetation and wetlands management measures such as pre-construction surveys for rare, culturally significant plants, and those protected under the SARA. The plan would include protocols for native and SARA-listed plant salvage and

relocation, and measures to establish plant species of cultural significance to Indigenous Groups. Wetland creation and enhancement measures, a schedule and timeline for implementation, monitoring and performance standards, and adaptive management would be part of the Wetland Offsetting Plan. The plan would require consultation with Indigenous Groups and regulatory agencies, and require that the compensatory wetland sites performance standards exceed the level of function of the habitat being compensated, and provide higher value and larger area than the wetland habitat it is replacing. The EAO is also recommending a KMM under CEAA 2012 for a Wetland Compensation Plan to offset the direct loss of wetland and riparian vegetation and ecosystems through enhancement and creation of wetland and riparian ecosystem and to monitor the functioning of the wetland area.

INDIRECT EFFECTS TO WETLAND AND RIPARIAN ECOSYSTEMS

Musqueam Indian Band and ECCC raised concerns about indirect effects to wetlands and vegetation due to erosion, sediment build-up, and degradation of wetland and shoreline habitat due to vessel wake, invasive species, and fugitive dust.

> In response, TJLP noted that the Dredge Management Plan would outline methods for sediment control during dredging, the In-Water Works Management Plan would be developed to reduce sediment disturbance during construction and prevent release of deleterious substances into the aquatic environment and the Erosion and Sediment Control Plan would also provide mitigation to avoid or minimize the potential for erosion and sediment input into watercourses during construction. TJLP's vessel wake assessment did not predict effects to shorelines from TMJ-associated vessel wake.
>
> Under the provincial *Weed Control Act*, TJLP would be required to control noxious weed populations at the TMJ site. Information on how to prevent, mitigate, control, dispose and report on invasive plants would be outlined in the Invasive Plant Species Management Plan (as part of the Vegetation Management Plan). This would include preventing and managing the potential spread of invasive plants after revegetation activities on disturbed soils from the TMJ site to surrounding areas. Transportation can facilitate the movement of exotic organisms particularly due to ballast water exchange. TJLP proposes a Ballast Waste Management Plan that would comply with legislated shipping requirements.
>
> Fugitive dust deposition may result in reduced growth and vigor of plant species, including traditional use plants. TJLP acknowledged that dust production may occur and would be managed with BMPs (refer to Section 5.1, Air Quality) for wetland and riparian ecosystems and plant species of management concern.

The EAO is proposing Condition 12: Water Quality Management Plan and recommending KMMs under CEAA 2012 that would include mitigations measures to minimize effects to water quality,

including sediment dispersion during in-water works and dredging. The EAO is also proposing erosion and sediment control measures as part of Condition 10: Construction Environmental Management Plan, Condition 11: Operations Environmental Management Plan and recommending as KMMs under CEAA 2012. The plan includes measures to prevent and manage the potential spread of invasive plants. The EAO acknowledges that, to prevent further spread onsite and beyond, Japanese knotweed should be controlled prior to construction. Conditions would require consultation with Indigenous Groups and regulatory agencies.

5.8.4 THE EAO'S ANALYSIS AND CONCLUSIONS

This section presents the EAO's conclusions on the potential adverse residual effects from TMJ on the Vegetation VC. The EAO considered construction and operations activities that could affect Vegetation through loss of species of management concern, introduction and extent expansion of invasive species, and direct and indirect loss of wetland and riparian ecosystems.

Proposed Provincial Conditions and Key Mitigation Measures (CEAA 2012)

Based on mitigations proposed in the Application and issues raised during Application review, the EAO proposes these provincial conditions and recommends KMMs under CEAA 2012:

- Condition 10: Construction Environmental Management Plan (provincial condition);
- Condition 11: Operations Environmental Management Plan (provincial condition);
- Condition 18: Vegetation and Wetland Management and Wetland Offsetting Plan (provincial condition); and
- Mitigation measures to reduce effects to migratory birds, including a Wetland Compensation Plan (KMM).

The EAO also proposes Condition 12: Water Quality Management Plan and KMMs under CEAA 2012 for water quality (see the Water Quality assessment in Section 5.5) which is relevant to the Vegetation VC.

Residual effects: After considering the proposed mitigation measures, the EAO concludes that TMJ would result in the following residual adverse effect to the Vegetation VC for the Application scenario and BVS:

- Loss or alteration of wetland and riparian ecosystems due to site clearing, ground disturbance, other site preparation activities, and onshore and offshore works during construction and machinery access and maneuvering for removal of onshore and offshore facilities during decommissioning.

The EAO found that TMJ would have negligible effects on plant species of management concern and no marine plants, as defined in subsection 2(1) of the SARA, were identified during TMJ's baseline studies. As described above, the EAO proposes Condition 18: Vegetation and Wetland

Management and Wetland Offsetting Plan, including measures to minimize effects of ground disturbance, including clearing and grubbing, soil compaction and excavation on vegetation and wetlands. The plan would also require pre-construction surveys for rare, culturally significant plants and those listed under SARA in the Project Disturbance Footprint to ensure these plants can be salvaged and relocated, and noxious and invasive species management. The plan would require consultation with Indigenous Groups and regulatory agencies.

The EAO's characterization of the expected residual effects of TMJ on the Vegetation VC is summarized below, as well as the EAO's level of confidence in the effects determination (including likelihood and significance).

Table 21: Summary of Residual Effects for Loss of Wetland and Riparian Ecosystems

Criteria	Assessment Rating	Rationale
Context	Low resilience	There are no known at-risk (as defined by the B.C. CDC) wetland or riparian plant species in the LAA, and the wetlands in the Project Disturbance Footprint provide low levels of function due to historical disturbance and modifications. The Tilbury Island area is heavily industrialized, and the Fraser River Delta is an area of historic wetland loss. Due to effects of industrialization on wetland and riparian ecosystems, they are expected to have low resilience to changes and be sensitive to disturbance.
Magnitude	Low	TMJ would result in a direct loss of 0.23 ha (15 percent) of wetland and riparian ecosystems in the LAA (0.03 percent in RAA) during construction. TJLP would offset for losses, by creating or enhancing approximately 1.18 ha of estuarine marsh and riparian habitat. TJLP would be required to construct offsets or conduct enhancements promptly to minimize time lag effects between the removal and offsetting and would monitor them on an ongoing basis. During decommissioning, machinery access and maneuvering for removal of onshore and offshore facilities could result in the direct loss of wetland and riparian ecosystems. Areas affected by decommissioning activities would be restored to the state of surrounding habitat. In consideration of the requirement for offsetting, residual effects are predicted to be low in magnitude.
Extent	Local	The effects of direct loss of wetlands and riparian area would occur primarily in the Project Disturbance Footprint.
Duration	Long-term	Wetland and riparian loss would be expected to persist for the duration of construction and into operations, as wetland enhancement and creation may take several years (approximately three years) to achieve full functionality. After decommissioning, areas affected by the removal of piles would be restored to the state of surrounding habitat which may also take several years.

Criteria	Assessment Rating	Rationale
Frequency	Continuous	The effects of wetland and riparian loss would occur continuously for at least several years following construction and decommissioning until the ecological functions lost are created or enhanced through offsetting.
Reversibility	Reversible	The effects of wetland and riparian habitat loss are considered reversible in the long term because the jetty and other structures would be removed during decommissioning and habitat would be restored. The wetland enhancement and creation may take several years to achieve full functionality. Because wetland and riparian ecosystem loss would be replaced through wetland enhancement and creation, the effect is considered reversible.
Likelihood	There is a high likelihood of residual effects due to unavoidable wetland and riparian habitat loss. It is expected that riparian and estuarine marsh enhancements and creation would offset the direct loss of habitat following construction and decommissioning. With successful implementation of habitat offsetting, there is low likelihood for long-term residual effects.	
Confidence	The EAO's confidence in the effect assessment is moderate. There is a high degree of certainty that habitat would be lost and some uncertainty in the wetland enhancement and creation related to the success of the offsetting and the lag time to become effective. Offsetting must be fully implemented to ensure that no less than 0.95 ha of fully functional wetland ecosystems is created to mitigate adverse effects. There is also some uncertainty whether TJLP would use dredge material for wetland creation and enhancement. If TJLP used dredge material, it would be tested prior to use and any contaminated material would be disposed of appropriately. As such, potential adverse effects from using dredge materials for wetland creation and enhancement are not predicted. Wetland monitoring to assess biological, hydrological, and structural characteristics would occur over a number of years to confirm that offsetting achieves full wetland functionality.	
Significance	Considering the analysis above and the conditions identified in the TOC and Certified Project Description (CPD) (which would become legally binding if an EAC is issued), and recommended KMMs under CEAA 2012 (Appendix 1) the EAO is satisfied that TMJ is not likely to have significant adverse residual effects on the Vegetation VC.	

Note: Criteria and assessment ratings are defined in Appendix 5: Residual Effects Characterization Definitions.

5.8.5 CUMULATIVE EFFECTS ASSESSMENT

The EAO concluded that TMJ would result in a residual adverse effect to the Vegetation VC due to loss or alteration of wetland and riparian ecosystems. Wetland enhancement and creation to offset wetland loss may take several years to achieve full functionality. Until the time at which full functionality is achieved, residual effects from TMJ may cumulatively interact with past, present and reasonably foreseeable future projects and activities in the Vegetation RAA.

The Fraser River Delta is both an area of historic wetland loss and an area of regional importance to waterfowl, including migratory birds. Approximately 70 percent of the Fraser River Estuary's wetlands have been diked, drained, and filled to reclaim land for

development. The Lower Mainland/ Fraser Valley region has been identified as one of the geographic areas in B.C. where the documented continuing loss or degradation of wetlands has reached critical levels. Past, present and reasonably foreseeable future projects and activities in the Vegetation RAA that were considered in the cumulative effects assessment include:

- Coast 2000 Terminals;
- Vancouver Fraser Port Authority Fraser River Annual Dredging Program;
- FortisBC Tilbury LNG Plant Expansion (Phase 2) project;
- Delta Grinding Facility;
- Marine shipping;
- SeaSpan;
- Urban infrastructure development;
- VAFFC;
- Vancouver Fraser Port Authority Habitat Enhancement Program; and
- Varsteel.

Cumulative effects from the past and present projects and activities on the Vegetation VC in the RAA were considered under current baseline conditions.

Future projects and activities in the RAA that are on federal lands, in areas affected by the implementation of federal programs where the continuing loss or degradation of wetlands has reached critical levels, and where federal activities affect wetlands designated as ecologically or socio-economically important to a region would be required to adhere to the goals and objectives set out by The Federal Policy on Wetland Conservation (Government of Canada, 1991). Future projects and activities in the RAA on provincial lands would be required to apply the Environmental Mitigation Policy, which would include offsetting any wetland losses that cannot be adequately addressed through other mitigation measures in the mitigation hierarchy (that is, avoid, minimize, restore) and conduct monitoring over a number of years to confirm that offsetting achieves full wetland functionality.

Monitoring conducted as part of the EAO's proposed Condition 18: Vegetation and Wetland Management and Wetland Offsetting Plan, recommended KMMs under CEAA 2012 for a Wetland Compensation Plan, and TJLP's Decommissioning and Final Rehabilitation Plan is intended to detect unanticipated cumulative effects and address such effects through adaptive management.

Based on the information available at the time of this assessment, the enhancement or creation of approximately 1.18 ha of wetland habitat (0.95 ha greater than the amount of wetland loss due to TMJ) and the predicted success of wetland enhancement and creation following construction and decommissioning, the EAO concludes that significant cumulative effects on wetland and riparian ecosystems, thus the Vegetation VC, are not expected as a result of the

effects of TMJ (for both the Application scenario and BVS) interacting with the effects of other past, present and reasonably foreseeable future projects and activities.

5.8.6 CONCLUSIONS

Considering the above analysis and conditions identified in the CPD and TOC conditions, including Condition 10: Construction Environmental Management Plan, Condition 11: Operations Environmental Management Plan, and Condition 18: Vegetation and Wetland Management and Wetland Offsetting Plan (which would become legally binding if an EAC is issued), and recommended KMMs under CEAA 2012 for a Wetland Compensation Plan (Appendix 1), the EAO is satisfied that TMJ would not have significant adverse effects on the Vegetation VC.

5.9 WILDLIFE AND WILDLIFE HABITAT AND MARINE BIRDS

5.9.1 BACKGROUND

Wildlife and Wildlife Habitat and Marine Birds (MSA area) were selected as a VCs because TMJ and TMJ-related vessels have the potential to cause adverse effects to these VCs, they are important to Indigenous Groups and to members of the public.

The subcomponents (group of species) , focal species and indicators selected for the assessment are listed in *Table 22*[90]:

[90] Further rationale for the species at risk considered in the assessment is provided in Appendix 6.

Table 22: Key assessed wildlife and marine bird subcomponents, focal species and indicators

Wildlife	Marine Birds
Subcomponents and focal species	
• Amphibians: Pacific chorus frog; • Waterbirds: Double-crested cormorant and Great blue heron (*fannini* Subspecies); • Migratory birds: Song sparrow[91]; • Barn owl[92]; and • Little brown myotis[93].	• Sea duck: Surf scoter; • Piscivorous diving bird/ pelagic bird: Cassin's auklet, Fork-tailed storm-petrel, Marbled murrelet; • Waterfowl: Brant and Canada goose; • Gulls and terns: Glaucous-winged gull; and • Shorebirds: Black oystercatcher and Red knot.
Indicators	
• Habitat quality and quantity: area and suitability of wildlife habitat; • Wildlife mortality: sources of mortality and intensity of effect; and • Wildlife movement: barriers to wildlife movement.	• Marine bird habitat quality and quantity[94]; • Disturbance/ behavioural change; and • Marine bird mortality.

The effects assessment of Wildlife and Wildlife Habitat is linked to the Air Quality (Section 5.1), Water Quality (Section 5.5), Fish and Fish Habitat (Section 5.6), Vegetation (Section 5.8), Land and Marine Resource Use (Section 8.2), Visual Quality (Section 8.3), Noise (Section 6.2), River Processes (Section 5.3), Vessel Wake (Section 5.4), and Accidents and Malfunctions (Section 9) VCs. The effects assessment of Marine Birds VC is linked to the Marine Resource Use (Section 8.2), Vessel Wake (Section 5.4) and Marine Fish (Section 5.6), and Accidents and Malfunctions (Section 9) VCs. The results of the Wildlife and Wildlife Habitat and Marine Birds assessment are incorporated into the Current Use VC (Section 11.4). For the EAO's assessment of the potential effects of dredgeate disposal to the Wildlife and Wildlife Habitat VC, refer to Section 2.2.5 (Alternative Means of Undertaking the Project) of this Report.

[91] TJLP selected song sparrow as the focal species to represent the potential effects of TMJ on migratory birds and other upland birds that could use the riparian vegetation in the LAA. Potential effects to migratory birds resulting from changes in habitat are captured in the assessment of the song sparrow. Regionally, song sparrow is not a migratory species. As a result, TJLP conducted additional assessments specific to potential effects on migratory birds due to artificial light sources that have been summarized and considered in this Report.

[92] Barn owl and little brown myotis were not identified in the AIR or Application as a subcomponent for review. During Application review, ECCC recommended that potential effects of TMJ on barn owl and little brown myotis be considered in the assessment and TJLP submitted technical memorandums which have been captured in this Report.

[93] Ibid.

[94] This indicator applies only to the following subcomponents: Gulls and terns, Waterfowl and Shorebirds.

5.9.1.1 REGULATORY CONTEXT

The following statutes, policies and guidelines were identified in the Application as being of relevant context for the assessment of the Wildlife and Wildlife Habitat VC:

- Federal *Species at Risk Act* (SARA);
- Federal *Migratory Bird Convention Act*;
- Provincial *Forest and Range Practices Act*;
- B.C. *Wildlife Act;*
- Section 5(1)(a)(iii) of CEAA 2012 requiring the assessment of adverse effects on migratory birds; and
- The Federal Policy on Wetland Conservation (1991) committing all federal departments to a goal of no net loss of wetland functions under specific conditions (see Section 5.8, Vegetation).

Multiple provincial strategies, plans, guidelines, and BMPs also provide guidance relevant for the Wildlife and Wildlife Habitat VC.

5.9.1.2 BOUNDARIES

WILDLIFE AND WILDLIFE HABITAT

The LAA for the assessment of the Wildlife and Wildlife Habitat VC is the TMJ Site with a 100 m buffer area. The RAA includes the LAA and the South Arm of the Fraser River downstream of the TMJ Site boundary to Sand Heads with a 50 m buffer from the high-water mark on either side (Figure 8).

MARINE BIRDS (MSA AREA)

The spatial boundary for the Marine Bird VC (Marine Bird MSA Area) extends from the shipping channel to the high-water mark between Sand Heads and the 12 nm limit.

5.9.2 POTENTIAL PROJECT EFFECTS AND PROPOSED MITIGATIONS IN THE APPLICATION

In response to Working Group comments, during Application review, TJLP provided supplementary wildlife information and conducted additional assessment on the potential effects on migratory birds, barn owl and little brown myotis. In addition to the Application, TJLP submitted a separate MSA including an assessment of potential effects on the Marine Bird VC. These materials are summarized below and were considered in the EAO's assessment of effects.

5.9.2.1 BASELINE INFORMATION

The LAA, including the TMJ site, is situated in the Boundary Bay – Roberts Bank – Sturgeon Bank Important Bird Area (IBA) which consists of a complex of marine, estuarine, freshwater and agricultural areas. The habitat in the LAA has been altered by previous development and industrial activities and lacks high-quality foraging or nesting habitat for most terrestrial passerine species and migratory bird species (for example, migratory passerines, shorebirds, and waterfowl). Terrestrial portions of the LAA are maintained as lawn or covered with asphalt, compacted gravel, and infrastructure and no longer maintain natural ecosystem characteristics.

In the LAA, amphibian habitat may be present in the riparian area between the estuarine marsh habitat and paved area, including anthropogenically-modified vegetated areas. Potential breeding habitat is located in nearby swamp, ditch, and foreshore areas, though TJLP concluded that none of these habitats were high quality. No amphibians were observed during field studies. Habitat exists for the double-crested cormorant and great blue heron within the LAA. The Application concluded that the LAA does not contain suitable foraging or nesting habitat for barn owl. Riparian areas and marshes within the LAA may be used as foraging habitat for little brown myotis.

The Marine Bird MSA Area includes Important bird areas (IBAs), migratory bird sanctuaries, provincial parks, ecological reserves, wildlife management areas, and the Gulf Island and Pacific Rim national park reserves. These productive ecosystems support marine bird breeding colonies and large, seasonally abundant gatherings of over-wintering birds, providing birds with foraging, resting and nesting opportunities. The Marine Bird MSA Area overlaps the Pacific Flyway bird migration route which is one of four major bird migratory routes that connect the Arctic to South America through North America.

5.9.2.2. WILDLIFE AND WILDLIFE HABITAT - POTENTIAL PROJECT EFFECTS

This section provides an overview of potential effects and proposed mitigations identified in the Application.

HABITAT LOSS AND BARRIERS TO MOVEMENT

Clearing of the TMJ site during construction to accommodate the jetty and trestle would result in the loss of 0.21 ha (<0.2 percent of similar habitat in the RAA) of potential amphibian breeding and upland habitat. Construction of the jetty would result in the direct loss of 0.18 ha (0.1 percent of similar habitat in the RAA) of great blue heron foraging habitat. Clearing of riparian habitat to accommodate the trestle would result in the loss of 0.13 ha of upland habitat that could provide roosting or nesting site for great blue heron and potentially suitable nesting and foraging habitat for migratory birds. During construction, approximately 0.23 ha of marsh and riparian habitat (approximately 0.2 percent of similar habitat in the RAA) that may

be used for foraging by bats would be lost. TJLP noted that estuarine marsh creation and restoration is expected to increase the amount and suitability of foraging habitat in the LAA, offsetting the amount of habitat disturbed.

The new jetty would extend 230 m into the aquatic habitat and be approximately 10 m above the water level at high tide. TJLP noted that wildlife would be expected to move under or over the facilities and that local wildlife was likely already adopted to the presence of these types of structures.

DISTURBANCE – NOISE AND LIGHT

TMJ would be situated in an industrial area with multiple sources of daytime and nighttime noise and light. The Application described the existing noise levels in the LAA as above 50 A-weighted decibels (dBA). During construction, dredging and pile driving would be the loudest activities.

During construction, TJLP predicted noise levels to be between 40 dBA to 70 dB at the warehouse, where there is suitable barn owl nesting and roosting habitat, and up to 90 dB at potential bat foraging areas. In-water works are generally expected to occur during the day (not during bat foraging periods) and would predominantly avoid the maternity period for little brown myotis. Noise was predicted to attenuate to between 48 to 56 dB by the maternity roost on Deas Island. During operations, noise is not predicted to exceed 40 dBA at the warehouse and to remain below 65 dB in bat foraging habitat and at the maternity roost (up to 37 dB).

TJLP predicted that up to 0.3 ha (0.33 percent of similar habitat in the RAA) of amphibian habitat would be affected by both noise and light during all TMJ phases.

Migrating birds are known to be attracted to artificial lights at night or in poor visibility conditions during the day, which can result in disorientation leading to fatigue and collisions. TJLP concluded that as substantial lighting already exists in the LAA from adjacent facilities, TMJ's contributions to effects to migratory birds would be negligible.

Access to foraging habitat under the trestle is expected to be maintained, and TJLP do not expect that TMJ would reduce fish habitat or fish abundance, and in turn, prey availability for piscivorous wildlife is expected to remain unchanged.

MORTALITY

Wildlife mortality could occur due to vegetation clearing or vehicle/ wildlife collisions or strikes with jetty infrastructure. Bright lights used at night during construction and operations may further increase the likelihood of collision with infrastructure. Potential effects of wildlife mortality are expected to be similar through all TMJ phases.

TJLP predicted that residual effects on amphibians due to mortality during habitat clearing during construction can predominantly be avoided through pre-construction surveys and salvages. TJLP concluded that resident birds that forage in the LAA and RAA are expected to be adapted to noise, light, and other infrastructure features associated with an industrial setting and are not expected to interact with jetty features. Additional vehicle traffic due to construction is estimated to be an increase of 100 vehicles a day, a <1 percent volume increase in weekday traffic volume in the LAA. TJLP predicted that residual effects on due to mortality would be negligible during all phases.

BUNKER VESSEL SCENARIO

In the Application, TJLP assessed potential wildlife interactions with vessel movements and considered potential for vessels to disturb birds and risk of mortality from collisions (aquatic birds only). In the BVSA, TJLP stated that the proposed increase in bunker vessel traffic is not predicted to change the extent of the zones of influence applied to TMJ to account for potential disturbance. Given that TJLP are not proposing new activities from what was assessed in the Application, TJLP concluded that the characterization of effects is not predicted to change, and the frequency of disturbance remains continuous. While the risk of interaction with aquatic birds is increased in the BVS, TJLP does not expect that mortalities would be more frequent than once a year given the infrequency of reported collision-related aquatic mortality and the limited aquatic bird abundance in the LAA. TJLP concluded that aquatic birds occurring near the TMJ site and in the navigational channels of the Fraser River are expected to be resilient to an incremental increase in vessel traffic. As vessels would predominately be in the navigational channels regularly used by marine traffic, situated in a highly industrialized system, TJLP concluded that the incremental increase in annual bunker vessels transits is predicted to result in negligible effects on Wildlife and Wildlife Habitat.

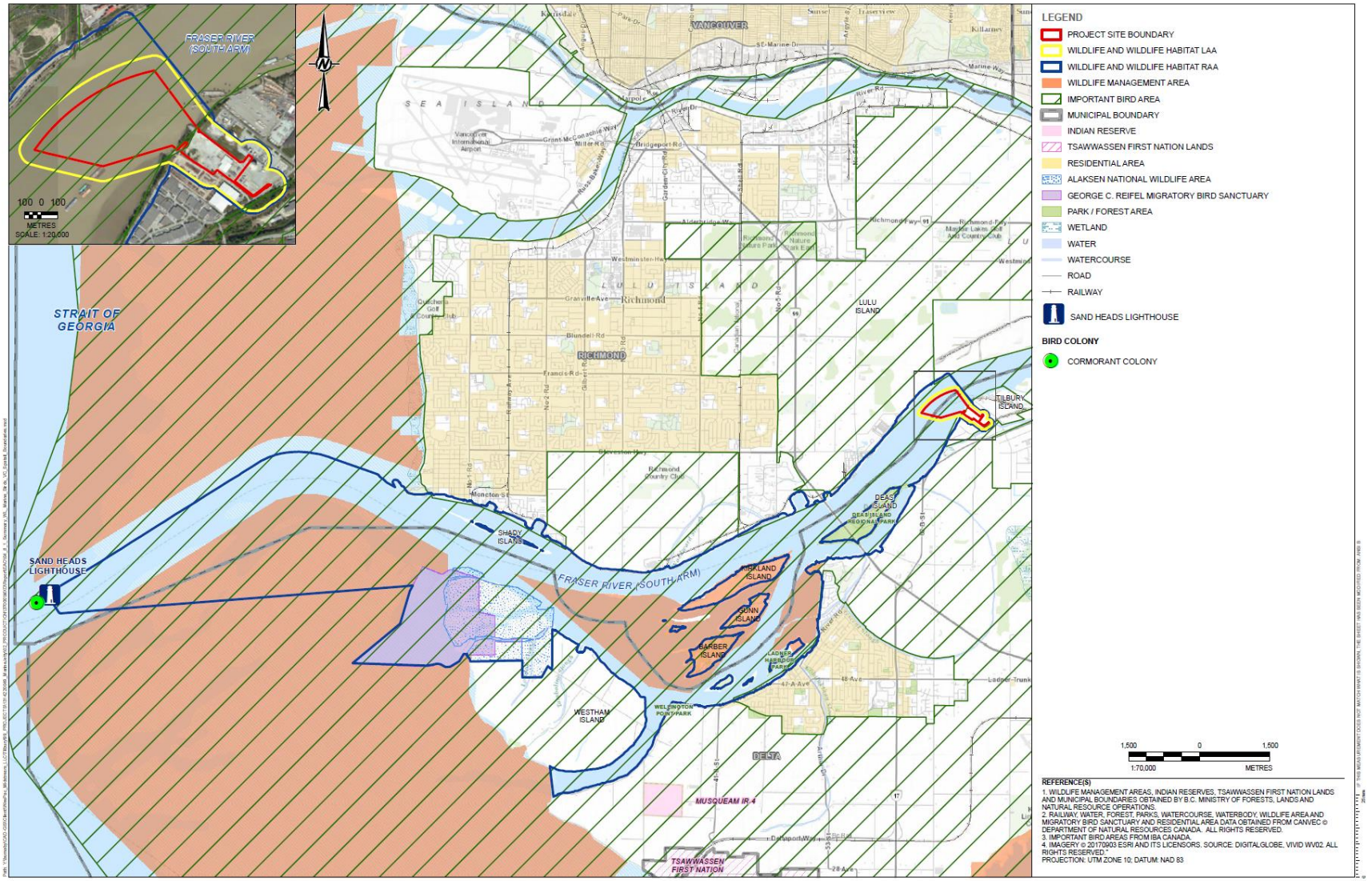

Figure 8: Wildlife and Marine Birds features and spatial boundaries for the original Application area (jetty to Sand Heads).

5.9.2.3 MARINE BIRD – POTENTIAL PROJECT EFFECTS

HABITAT LOSS – WAKE

Increased wave action along the shore due to TMJ vessel wake could result in erosion, reduced availability of food, or disturb or displace birds near shore. Several species of shorebirds, waterfowl, and gulls, including the red knot, brant, and glaucous-winged gull, use tidal mudflats, eelgrass beds, and ocean beaches as foraging habitat. TJLP concluded that TMJ-related vessel generated waves would be within the range of natural wave conditions and would not have a measurable effect on marine birds.

DISTURBANCE - VISUAL AND ATMOSPHERIC NOISE, AND UNDERWATER NOISE

TJLP predicted that marine birds may alter their movement or feeding activity and demonstrate avoidance behaviour within one km of TMJ-related vessels that travel through the Marine Bird MSA Area. TMJ vessels would follow established shipping lanes, situated between one and 10 km from the shoreline, with the majority of the route located away from shorelines. Shorebirds (red knot and black oystercatcher) and species occurring in the nearshore (surf scoter, grebes, marbled murrelet, brant, Canada goose) are not expected to frequently occur within one km of the shipping lanes for most of the route.

TMJ-related changes to the underwater acoustic environment from TMJ vessels could affect marine birds, particularly those species that dive and forage underwater. Based on their feeding ecology, piscivorous diving birds (for example, fork-tailed storm-petrels, Cassin's auklet, and marbled murrelet) and sea ducks (that is, surf scoter) are predicted to be most vulnerable to underwater noise disturbance. TMJ is expected to result in an incremental increase in vessel movements in the Marine Birds MSAA (0.2 percent to 1.1 percent depending on segment) and the effect on the populations of marine bird subcomponents from atmospheric or underwater noise is expected to be negligible.

MORTALITY – STRIKES, COLLISIONS AND DISORIENTATION

TMJ-related vessels transiting through the Marine Bird MSAA could result in bird mortality due to vessel strikes (that is, vessels hitting birds). Species that may be more susceptible to strikes include species that sleep roost on the water during the night (e.g., surf scoter) and pelagic species (e.g., fork-tailed storm petrel and Cassin's auklet) due to their occurrence in offshore environments and diving foraging habits. Birds attracted to artificial light sources from vessels may become disorientated and continuously fly around illuminated vessels resulting in fatigue that can lead to mortality or collision (that is, birds hitting vessels) with vessels. Migrating birds are most susceptible due to their reduced energy reserves and flight paths over open water.

TJLP concluded that TMJ is not expected to result in a meaningful increase in vessel traffic in the Marine Bird MSAA, and TMJ-related vessels are not expected to use high-powered artificial

lights for navigation that are shown to have the most pronounced effect on marine birds. TJLP predicted no increased risk of marine bird-vessel strikes with vessels in the Marine Bird MSAA, although there could be collisions with marine birds associated with vessel lighting and disorientation.

5.9.2.4 MITIGATION MEASURES PROPOSED IN THE APPLICATION

The Application proposed mitigation measures to reduce the effects of TMJ on the Wildlife and Wildlife Habitat VC, including:

- **Wildlife Management Plan:** Describe pre-construction surveys, mitigation in consideration of applicable BMPs, ongoing wildlife monitoring, reporting and recording wildlife conflicts, and methods to evaluate the effectiveness of mitigation measures;
- **Erosion and Sediment Control Plan (ESCP):** Identify design and layout of erosion control measures and stormwater management;
- **Light Management Plan**: Identify wildlife-specific light management, including outdoor lighting designed to reduce light trespass (i.e., light extending beyond target) and skyglow (i.e., illumination of the night sky) during construction and operations;
- **Noise Management Plan:** Identify wildlife-specific noise control, including maintaining acoustic barriers (for example, vegetation and trees) around the active work areas, enclosing noise producing machinery, using acoustic screens, and minimizing speed on roadways;
- **Transport Management Plan** (Land-Based Traffic): Identify measures to limit and control speed on TMJ roadways (for example, 10 km/hr speed limit on-site);
- **Vegetation Management Plan**: Guidance for replanting temporarily disturbed habitat with native species following the completion of construction and removal and disposal of existing invasive plants and maintenance of subsequently restored vegetated areas; and
- **Wetland Mitigation Plan:** Identify wetland enhancement and creation to off-set direct loss.

No additional mitigation measures were proposed by TJLP as part of the BVSA.

TJLP has not proposed mitigation measures specific to vessels associated with TMJ. Vessel lighting is mandated by international regulations and standards. These regulations describe the lighting that is required for signaling and visibility. TMJ vessels transiting through the existing shipping lanes would follow the federal "On the Water" guidelines[95] (e.g., maintaining sufficient distance to avoid disturbing nesting birds, travelling at steady speeds, moving parallel to the

[95] ECCC's guidelines to avoid disturbance to seabird and waterbird colonies in Canada, dated 2018 (https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/avoid-disturbance-seabird-waterbird-colonies-canada.html).

shore, maintaining constant engine noise levels, and not pursuing seabirds on the water surface). These are not considered mitigation measures for Marine Birds.

5.9.3 POTENTIAL PROJECT EFFECTS AND PROPOSED MITIGATIONS IDENTIFIED DURING APPLICATION REVIEW

The following key issues related to the assessment of Wildlife and Wildlife Habitat for TMJ were identified during Application review and based on feedback from the Working Group:

- Barn owl;
- Migratory birds;
- Sensory disturbance
- Air quality; and
- Marine shipping.

BARN OWL

ECCC raised concerns regarding potential effects to barn owl and the effectiveness of proposed mitigation measures to address disturbance to roosting barn owls.

> TJLP responded in a memo[96] that pre-construction surveys (day and night-time) for barn owl would be conducted to determine presence and use. Acoustic screens or other noise mitigating measures, depending on the sources of noise and receptor location, would be implemented if there was evidence of barn owl use, and a database of barn owl observations would be maintained. TJLP's Wildlife Management Plan would also have recommended procedures for chance encounters.

The EAO recommends KMMs under CEAA 2012 for a Barn Owl Management Plan that would require nocturnal and diurnal pre-construction surveys, mitigations related to sensory disturbance, physical barriers and annual reporting to assess mitigation effectiveness and any need for adaptive management measures. Noise would be managed during all TMJ phases according to applicable BC OGC guidelines (including BC OGC's Noise Control Best Practice Guidelines). The EAO is also proposing noise management as part of Condition 10: Construction Environmental Management Plan and Condition 11: Operations Environmental Management Plan. Monitoring would allow for detection and adaptive management in response to noise exceedances.

[96] TJLP's response to ECCC and Agency information requests dated July 11, 2019 (https://www.projects.eao.gov.bc.ca/api/public/document/60a48839148b4a0023306067/download/20190711_ECCC_Wildlife.pdf).

MIGRATORY BIRDS

ECCC raised concerns regarding the selection of song sparrow as the sub-component for terrestrial and migratory birds because it is regionally a resident species and would not capture the potential effects of TMJ on migratory bird species. ECCC asked TJLP to provide an effects assessment considering potential effects of artificial light on migratory birds.

During Application review, TJLP acknowledged that, in the B.C. Lower Mainland, song sparrow does not conduct annual migrations similar to other migratory passerine species and therefore may not be representative of potential mortality due to collisions with infrastructure and fatigue associated with disorientation from lights. TJLP provided additional information in two memos[97] and assessed the potential effects of TMJ related to artificial lighting (presented in Section 5.9.2.2) and proposed additional mitigation measures for the marine terminal area:

- Navigational lights would be flashing and directed horizontally to reduce skyglow, based on navigational safety standards;
- Night-time construction work required would be scheduled to avoid sensitive migratory periods (particularly during fog or cloud cover) and conducted under a canopy (or similar structure) to minimize light trespass and skyglow; and
- Surveys for bird mortality would be conducted during migratory periods and records of dead wildlife would be maintained. The results of surveys may be used to implement adaptive management as part of the Wildlife Management Plan.

The EAO is satisfied that TJLP provided sufficient information and effects assessment in memoranda during Application review related to effects on migratory birds. The EAO is proposing Condition 10: Construction Environmental Management Plan, that would identify timing windows and mitigation to avoid human-wildlife conflict and Condition 11: Operations Environmental Management Plan, that would identify mitigation measures to be implemented during operations and describe wildlife monitoring, reporting requirements, and adaptive management. The plans would both include wildlife-specific measures for light management including potential attraction of birds. The EAO also recommends KMMs under CEAA 2012 for migratory birds, including strategies to minimize glare such as direction, timing and intensity to be employed, where lighting is not standardized based on navigational and safety requirements.

[97] TJLP response to ECCC and Agency information requests dated July 11, 2019 (https://www.projects.eao.gov.bc.ca/api/public/document/60a48839148b4a0023306067/download/20190711_ECCC_Wildlife.pdf) and TJLP's response to ECCC comments dated May 17, 2019 (https://www.projects.eao.gov.bc.ca/api/public/document/5ce5820fc414f300241393c4/download/20190517_ECCC-barn%20owl%2C%20migratory%20birds%2C%20little%20brown%20bat.pdf).

SENSORY DISTURBANCE

Musqueam Indian Band, Tsleil-Waututh Nation and Tsawwassen First Nation, and Snuneymuxw First Nation raised concerns about potential harm to or displacement of wildlife due to increased noise and light and questioned the assumed habituation of wildlife to current levels of disturbance.

> In response, TJLP stated that given TMJ is in an industrialized area, noise levels at baseline are generally above the levels that tend to alter wildlife behaviour. Pre-project noise conditions are greater than the noise thresholds, yet species continue to persist in the RAA and the LAA. In terms of lighting, TMJ is expected to contribute to an existing industrial lightscape to which species in the LAA are adapted. Given the limited information on noise and light thresholds in urban environments, TJLP established zones of influence for each subcomponent based on published best management practices and/ or provincial setback recommendations to guide the assessment of indirect effects. Effects of noise and light on the wildlife subcomponents were measured from the Project Disturbance Footprint (that is, source of disturbance), as such, these potential effects were considered in the Application through the application of zones of influence.

The EAO is proposing noise and light management as part of Condition 10: Construction Environmental Management Plan and Condition 11: Operations Environmental Management Plan. Wildlife specific mitigation to be included in the plans include the use of LED lights, temporal mitigation measures (for example, reducing lighting in bird-sensitive periods such as migration). Ongoing monitoring and adaptive management would also be included in the plans, given the inherent uncertainty in evaluating the potential responses of wildlife to light generated by TMJ. The EAO has also recommended KMM under CEAA 2012 for a follow-up program in the marine terminal area to verify the predictions of the EA as it pertains to the effect of artificial light on coastal birds.

AIR QUALITY

Tsleil-Waututh Nation and Tsawwassen First Nation raised concerns that the pathway of air quality effects on vegetation, wildlife habitat, and wildlife was not adequately assessed.

> TJLP noted that air quality was not identified as a major factor contributing to the decline or affecting the resilience of vegetation or wildlife subcomponents selected for TMJ. Residual effects to Vegetation and Wildlife and Wildlife Habitat VCs from air quality would be anticipated to be negligible and not change the significance determination of the respective chapters.

The EAO understands that ECCC is of the view that a risk assessment evaluating the potential risks to flora and fauna through the air exposure pathway would not be typically undertaken unless there are specific, key concerns (i.e., high concentrations of VOCs) that would further

inform an understanding of potential effects. The EAO agrees that further assessment is not required. The EAO proposes Condition 19: Air Quality Management Plan, Condition 20: Greenhouse Gas Reduction Plan, and recommends KMM under CEAA 2012 for an Air Quality Management Plan, which would outline mitigations required to reduce adverse effects to air quality during construction and operations.

MARINE SHIPPING

ECCC and Tsleil-Waututh Nation raised concerns about the baseline information for the Marine Bird assessment, and in particular, ECCC raised concerns about the use of RBT2 and TMX assessments to describe baseline conditions and encouraged TJLP to consider technical advice and recommendations from ECCC submitted as part of the panel process. ECCC also raised concerns about uncertainty associated with the extent to which effects on marine birds would be adverse, based upon a lack of available scientific information and/ or understanding, and lack of monitoring data for anticipated effects (for example, mortality arising from ship-associated interactions) as well as potential cumulative effects.

> TJLP responded that data presented in TMX and RBT2 were incorporated into the description of baseline conditions in the MSA and supplemented with additional and updated with information presented after the time of submission of TMX and RBT2, to verify information presented in these reports, and to update spatial and temporal gaps that may exist. Given the amount of data available for the Marine Bird MSA Area, the existing available data was considered sufficient for the assessment of baseline conditions.
>
> TJLP concluded that residual effects associated with TMJ-related shipping were unlikely to cause population level adverse effects. TJLP acknowledged that while there is lack of information in the literature regarding the effects of shipping on marine birds, conservative assumptions have been implemented in the assessment to account for this uncertainty. For example, a larger (1,000 m) zone-of-influence was applied to the transiting ship to account for potential effects on marine birds although the actual zone of influence is expected to be smaller. TJLP acknowledged that general shipping activity in the Salish Sea may cumulatively affect marine birds; however, the effects from TMJ-related shipping were not predicted to be measurable. Further, based on the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and federal assessment reports and recovery strategies, shipping has not been identified as the dominant threat to the focal species assessed in the MSA; although the risk of a large oil spill has been identified as an emerging threat/ risk.

The EAO notes that vessel lighting is mandated by international regulations and standards and that TMJ-related vessels transiting through the existing shipping lanes would follow the federal

"On the Water " guidelines[98]. The EAO recommends a KMM under CEAA 2012 regarding the required participation in the VFPA-led ECHO Program seasonal slowdown initiatives. Although vessel-based survey data was not included in the MSA, the EAO has considered the uncertainty of potential effects on Marine Birds in the EAO's assessment and is satisfied with the baseline information presented in the MSA.

5.9.4 THE EAO'S ANALYSIS AND CONCLUSIONS

This section presents the EAO's conclusions on the potential adverse residual effects from TMJ on:

- The Wildlife and Wildlife Habitat VC;
- The Marine Birds VC;
- CEAA 2012 5(1)(a)(iii): migratory birds as defined in subsection 2(1) of the *Migratory Birds Convention Act*, 1994; and
- Wildlife species subject to SARA 79(2): great blue heron, barn owl, little brown myotis, Cassin's auklet and marbled murrelet.

The EAO evaluated the potential effects to the above by considering construction, operations and decommissioning activities that could affect wildlife and marine bird habitat quality and quantity, distribution and abundance.

Proposed Provincial Conditions and Key Mitigation Measures (CEAA 2012)

Based on mitigations proposed in the Application and issues raised during Application review, the EAO proposes the following provincial conditions and recommends KMMs under CEAA 2012:

- Condition 10: Construction Environmental Management Plan (provincial condition), which includes requirements for lighting, noise and wildlife and wildlife habitat management, and stormwater management and erosion and sediment control;
- Condition 11: Operational Environmental Management Plan (provincial condition), which includes the requirements for vegetation and wetland management, lighting, noise and wildlife and wildlife habitat management and monitoring;
- Condition 18: Vegetation and Wetland Management and Wetland Offsetting Plan, which includes requirements for vegetation and wetland creation and restoration; and

[98] "On the Water" Guidelines", as part of the Guidelines to avoid disturbance to seabird and waterbird colonies in Canada. Available at: https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/avoid-disturbance-seabird-waterbird-colonies-canada.html

- Key mitigation measures under CEAA 2012 to reduce effects to migratory birds, including a Wetland Compensation Plan (KMM).

Residual effects: After considering all relevant proposed mitigation measures, the EAO concludes that TMJ would result in the following residual adverse effects for the Application scenario and BVS:

- Wildlife and Wildlife Habitat VC:
  - Loss or alteration of habitat from site preparation, ground stabilization, and construction of onshore and offshore facilities during construction and associated with the removal of facilities during decommissioning;
  - Sensory disturbance from noise and light during construction, operations and decommissioning; and
  - Increased risk of mortality during construction, operations, and decommissioning.
- Marine Bird VC:
  - Mortality due to collisions with vessels and disorientation from vessel lighting.

The EAO's characterization of the expected residual effects of TMJ on the Wildlife and Wildlife Habitat VC (Table 23) and Marine Bird VC (Table 24) are summarized below, as well as the EAO's level of confidence in the effects determination (including likelihood and significance).

Table 23: Summary of residual effects for Wildlife and Wildlife Habitat

Criteria	Assessment Rating	Rationale
Context	Low to Moderate Resilience	TMJ would occur in an area with a history of anthropogenic disturbances, including past habitat loss and sensory disturbance. Species occurring in the LAA are expected to be habituated to industrial noise and light given the location of TMJ. However, given the current industrialized nature of the TMJ area, wildlife species could possibly be sensitive to further industrial development and increases in vessel traffic and noise. Effects from past development in the region have contributed to moderate resiliency for most wildlife species but have resulted in low resiliency for species of conservation concern.
Magnitude	Habitat Loss or alteration: Negligible to Low	Habitat loss from TMJ would range from 0.13-0.23 ha for amphibians, waterbirds, migratory birds, and little brown myotis, which represents around 0.2% of similar habitat in the RAA.
	Sensory Disturbance: Negligible to Low	The suitability of approximately 0.3 ha (0.33 percent of similar habitat in the RAA) of amphibian habitat, 9.1 ha of double-crested cormorant foraging habitat, 6.9 ha (0.5 percent of similar habitat in the RAA) of great-blue heron foraging habitat, and 0.5 ha of song sparrow nesting and foraging habitat would be affected by noise and light during all TMJ phases. Artificial light is predicted to affect little brown myotis foraging behaviour and use of the LAA due to increased light levels. In-water works would produce the

Criteria	Assessment Rating	Rationale
		highest noise level and are expected to occur during the day, avoiding bat foraging periods. Daytime noise could affect barn owls roosting in structures (such as manmade buildings). TMJ is located in an industrial area adjacent to existing industrial facilities and various other industrial users which are substantially lit. Mitigation measures proposed to reduce light trespass and noise are expected to be effective in minimizing effects to foraging waterbirds, song sparrow nesting and foraging habitat, migratory birds, little brown myotis and barn owl. Wetland creation and enhancement is also expected to increase the amount and suitability of foraging habitat in the LAA, offsetting a portion of the amount of habitat disturbed. The residual effect of sensory disturbance is predicted to be negligible to low in magnitude for amphibians, water birds, migratory birds, little brown myotis and barn owl.
	Mortality: Negligible to Low	Pre-construction surveys and salvages are predicted to minimize mortality of Pacific chorus frog. Vegetation clearing is expected to occur outside of the general nesting periods for birds, in accordance with applicable provincial and federal regulations. Double-crested cormorant, great-blue heron and little brown myotis that forage in the LAA and RAA are expected to be adapted to noise, light, and other infrastructure features associated with an industrial setting and are therefore not expected to strike jetty features. Cormorants are expected to be able to avoid vessels given the slow speed of vessel movements between the TMJ site and Sand Heads; however, mortality associated with vessel strikes could occur. Potential mortality of migratory birds and little brown myotis due to strikes with jetty infrastructure is limited by mitigation measures proposed to reduce light trespass during construction and operations and because TMJ structures would not be supported by a guy wire system or exceed 20 m in height. There are a limited number of vehicles associated with TMJ construction, and TMJ is not located within barn owl nesting or foraging habitat. The residual effect of mortality is predicted to be negligible to low magnitude. TMJ is not anticipated to influence the short- or long-term viability of amphibians, waterbirds, migratory birds, barn owl and little brown myotis.
Extent	Local	**Habitat loss**: The residual effect of habitat loss is expected to be restricted to the LAA.
	Beyond Regional	**Sensory disturbance**: Sensory disturbance is primarily expected to be local. However, due to the shape of the RAA, which is generally restricted to the South Arm of the Fraser River and the south half of Tilbury Island and close to the TMJ site, sensory disturbance from light and noise is expected to extend beyond the RAA.
	Regional	**Mortality:** The residual effect of mortality is expected to be primarily restricted to the LAA; however, strikes with vessels could occur in the RAA.

Criteria	Assessment Rating	Rationale
Duration	Medium-term	**Habitat loss:** The effects of habitat loss are expected to be medium-term following construction, until estuarine marsh enhancements to offset the loss of habitat and improvements to the riparian are fully functional, which could take several years to achieve.
	Long-term	**Sensory disturbance:** Noise and light are predicted to affect habitat during all TMJ phases. Noise levels are predicted to be highest during construction.
	Long-term	**Mortality:** The effect of mortality is predicted to occur during all TMJ phases.
Frequency	Continuous	**Habitat loss:** The residual effects of habitat loss are expected to be continuous until estuarine marsh enhancements to offset the loss of foraging habitat and improvements to the riparian area are fully functional following construction.
	Continuous	**Sensory disturbance:** The residual effect of sensory disturbance is predicted to occur continuously over the life of TMJ.
	Infrequent	**Mortality:** The residual effect of mortality is predicted to be infrequent.
Reversibility	Reversible	**Habitat loss:** The residual effects of habitat loss are considered reversible in the long term because the jetty and other structures would be removed during decommissioning and habitat would be restored.
		Sensory disturbance: The residual effect of sensory disturbance is considered reversible, as noise and light produced by TMJ would cease following decommissioning.
		Mortality: The residual effect is present for the duration of TMJ and the effect pathway is reversible during decommissioning. Losses due to infrequent mortality are likely to be offset by natural recruitment through reproduction and migration, and the populations are expected to recover from possible mortality.
Likelihood	There is a high likelihood of residual effects due to unavoidable habitat loss and sensory disturbance. It is expected that riparian and estuarine marsh enhancements and creation would offset the direct loss of habitat. There is a low likelihood of long-term residual effects following successful implementation of habitat offsetting. Given the location of TMJ, it is expected that species using the LAA are adapted to the industrial setting. With effective implementation of mitigation (pre-construction surveys and salvage, lighting) and monitoring measures identified in TJLP's Wildlife Management Plan, the likelihood of mortality is predicted to be low.	
Confidence	The EAO's confidence in the effects assessment is moderate. There is a high degree of certainty that habitat would be lost and some uncertainty in the wetland restoration and creation related to the success of the offsetting and the lag time to become effective. TJLP would be required to construct offsets or conduct enhancements promptly to minimize time lag effects between the removal and offsetting. There is also some uncertainty in the response of wildlife, in particular migratory birds, in a highly industrialized setting to increases in light and noise, and risk of mortality of aquatic birds due to vessel strikes during transit.	

Criteria	Assessment Rating	Rationale
Significance	Given the low magnitude of predicted residual effects, the primarily local extent and the EAO's proposed TOC and recommended KMMs under CEAA 2012 (Appendix 1), the EAO concludes that the residual effects of the habitat loss and alteration, sensory disturbance and mortality are not likely to cause significant adverse environmental effects to wildlife and wildlife habitat in the region.	

Table 24: Summary of residual effects for Marine Birds

Criteria	Assessment Rating	Rationale
Context	Low to Moderate Resilience	The Marine Bird MSA Area includes Important bird areas (IBA), provincial parks, ecological reserves, wildlife management areas, and two national park reserves. Although shipping related mortality (excluding accidents and malfunctions) are not considered a major threat to marine bird species at risk, the MSA area is a heavily utilized marine environment with occasionally high levels of marine traffic in the shipping lanes. Marine birds are expected to have a moderate degree of resilience to imposed stresses from shipping.
Magnitude	Negligible to Low	TMJ-related LNG carriers, bunker vessels and tugs are not expected to use high-powered artificial lights for navigation that are shown to have the most pronounced effect on marine birds. Overall vessels movements associated with TMJ are predicted to be 0.6 percent, on average, of the overall movements in the Marine Bird MSA area. Residual effects of mortality due to collisions with or disorientation from TMJ-related vessels is considered negligible to low magnitude as it is expected to affect only a small number of individuals.
Extent	Marine Bird MSA	The extent of the residual effect of mortality is the Marine Bird MSA Area, although it is acknowledged that shipping associated with TMJ would continue beyond the 12 nm limit.
Duration	Long-term	The potential for interaction with LNG vessels is expected to continue throughout operations. The risk or mortality would cease after decommissioning; however, residual effects of mortality may persist beyond the termination of TMJ-related shipping.
Reversibility	Reversible	The residual effect is present for the duration of TMJ and is reversible during decommissioning. Losses due to infrequent mortality are likely to be offset by natural recruitment through reproduction and migration, and the populations are expected to recover from possible mortality.
Frequency	Infrequent	Although vessel movements would occur more frequently than once per week, the residual effect of mortality is predicted to be infrequent. Fork-tailed storm petrel mortality is predicted to occur infrequently as mortality due to collisions or fatigue from disorientation due to lights from TMJ-related vessels is expected to be rare. Marbled murrelet and Cassin's auklet mortality associated with TMJ-related shipping is predicted to occur infrequently given the limited overlap between foraging habitat and the shipping route.

Criteria	Assessment Rating	Rationale
Likelihood	The likelihood of the fork-tailed storm petrel, marbled murrelet or Cassin's auklet injury or mortality due to TMJ-related shipping is considered low. It is expected that species occurring in the Marine Bird MSA have moderate resiliency to imposed stresses from shipping related activities	
Confidence	The EAO's confidence in the effects assessment is moderate for the at-risk marine bird focal species recognizing that there is uncertainty in the time required for a population to recover from individual mortality. Although there may be a lack of vessel-based survey data within the MSA and existing information regarding populations trends of marbled murrelet and Cassin's auklet and recovery of marbled murrelet, conservative assumptions have been made in the assessment.	
Significance	Given the negligible to low magnitude and infrequence of predicted residual effects in the Marine Bird MSA Area, the EAO concludes that the residual effects of the mortality due to collisions with vessels and disorientation from vessel lighting are not likely to cause significant adverse effects to the Marine Bird VC in the region. Collisions with vessels is not considered a dominant threat to fork-tailed storm petrel, marbled murrelet or Cassin's auklet in B.C. TMJ-related shipping is not expected to contribute to the factors that have been established as major threats to the species. Collisions with vessels are not expected to change the viability of the populations or result in a measurable effect to regional populations.	

5.9.5 CUMULATIVE EFFECTS ASSESSMENT

During the EA, Indigenous Groups noted that under existing conditions, without TMJ, industrial activities are collectively affecting wildlife and wildlife habitat in the RAA and Marine Bird MSA Area. The EAO notes that there are cumulative effects occurring to wildlife habitats and ecosystems without TMJ which may be affecting wildlife populations. The EAO notes that there are uncertainties regarding the thresholds for population level health and viability for wildlife species in the Regional Study Area (RSA) and Marine Bird MSAA.

5.9.5.1 WILDLIFE AND WILDLIFE HABITAT

The Fraser River Delta is both an area of historic wetland loss and an area of regional importance to birds. Approximately 70 percent of the Fraser River Estuary's wetlands have been diked, drained and filled to reclaim land for development. The shoreline of the Fraser River South Arm is generally characterized by extensive industrial activity. TJLP's wetland enhancements and creation to offset the direct loss of habitat may take several years to achieve full functionality, and sensory disturbance from noise, light and mortality are predicted during all phases of TMJ.

Residual effects from TMJ may cumulatively interact with past, present and reasonably foreseeable future projects and activities in the Wildlife and Wildlife Habitat RAA, including:

- Coast 2000 Terminals;

- Vancouver Fraser Port Authority Fraser River Annual Dredging Program;
- FortisBC Tilbury LNG Plant expansion project;
- Fraser Wharves;
- Delta Grinding Facility;
- Marine shipping;
- Pattullo Bridge;
- SeaSpan;
- Urban infrastructure development;
- VAFFC;
- Vancouver Fraser Port Authority Habitat Enhancement Program; and
- Varsteel.

Contributions from past and present sources were captured by TJLP in its description of baseline conditions and informed the identification and analysis of the residual effects discussed above. These projects and activities were considered in the EAO's assessment of cumulative effects.

LOSS OR ALTERATION OF HABITAT

TMJ would result in a direct loss of 0.23 ha of wetland habitat, and TJLP is expected to create or enhance approximately 1.2 ha of wetland habitat, which would result in a gain of 0.97 ha. Once achieved, the quality of the habitat for wildlife and migratory birds would be improved over the current condition in which the site has existed in recent decades as a result of heavy industry. As explained in the cumulative effects section of the Vegetation VC (Section 5.8.5), it is anticipated that future projects and activities in the RAA would be required to apply best management practices and offsetting for any wetland losses that cannot be adequately addressed through other mitigation measures. Cumulative effects related to habitat loss or alteration are predicted to be medium-term (with effective creation and enhancement of wetland habitat), low in magnitude, reversible after decommissioning and not significant.

SENSORY DISTURBANCE FROM NOISE AND LIGHT

In the RAA, TMJ is situated within a noise scape where the existing noise conditions are generally greater levels that tend to alter wildlife behaviour. The EAO acknowledges that continued presence of birds and bats in the region may not indicate that they are fully habituated to the level in noise and artificial lighting. The shoreline of the Fraser River South Arm is generally characterized by extensive industrial activity and is highly urbanized and TMJ is not expected to influence existing level of brightness regionally. Migratory birds, in particular, are sensitive to the existing artificial light at night. For both the Application scenario and BVS, cumulative effects related to sensory disturbance from noise and light are predicted to be moderate magnitude during construction (when noise levels are highest), low magnitude during operations, continuous during all phases of TMJ, reversible after decommissioning and not

significant. The EAO acknowledges that there is some uncertainty in how vessel movements may affect the patterns of river use by aquatic birds given the industrial and urbanized setting. Future projects in the RAA would be required to adhere to safety standards for lighting and would apply BMPs to reduce noise as well as fugitive lighting at night.

INCREASED RISK OF MORTALITY

Artificial light may also contribute to cumulative effects on migratory bird mortality in the RAA. As stated above, the TMJ site is not expected to influence existing level of brightness in the LAA or RAA. The RAA is in a busy shipping area, and cumulative effects related to mortality associated with vessel strikes could occur. Beyond the TMJ site, vessels would follow navigational routes regularly used for vessel movements within the LAA and RAA. Given the slow speed of vessel movements in the Fraser River and the highly industrialized landscape, the predicted magnitude of cumulative effects of wildlife mortality related to artificial light and vessel strikes for both the Application scenario and BVS is predicted to be low magnitude, reversible after decommissioning and not significant.

5.9.5.2 MARINE BIRDS

All projects and activities with a marine shipping or vessel activity component were considered to interact with residual effects to the Marine Bird VC. For the Marine Bird MSA Area, a complete list of existing and reasonably foreseeable projects considered is provided in the MSA (Table 2.0-6). Reasonably foreseeable future projects and activities that involve shipping activities would contribute to increase the risk of injury and mortality on marine birds. In the MSA, TMJ would contribute an additional 236 vessel movements, which is 0.6 percent, on average, of the total overall vessel movements in the Marine Bird MSA area. This increase in marine traffic has the potential to affect Marine Birds through increased mortality risk. The cumulative effects of marine bird mortality related to vessels in the Marine Bird MSA Area is predicted to be low magnitude, the mortality risk would be reversible after decommissioning and overall not significant.

5.9.6 CONCLUSIONS

Considering the above analysis and the conditions identified in the CPD and TOC, including Condition 10: Construction Environmental Management Plan, Condition 11: Operations Environmental Management Plan, Condition 12: Water Quality Management Plan, and Condition 18: Vegetation and Wetland Management and Wetland Offsetting Plan, (which would become legally binding if an EAC is issued), and recommended KMMs under CEAA 2012 to reduce effects to migratory birds, including a Wetland Compensation Plan (Appendix 1), the EAO is satisfied that TMJ would not have significant residual or cumulative adverse effects on the Wildlife and Wildlife Habitat or Marine Birds VCs.

6.0 ASSESSMENT OF HUMAN HEALTH EFFECTS

6.1 HUMAN HEALTH

6.1.1 BACKGROUND

Human Health was selected as a VC based on its importance to Indigenous Groups, the public and other stakeholders as well as for its regulatory importance. The Application evaluated potential adverse effects to Human Health through effects stemming from potential changes to air quality, water quality, soil quality and country foods.

Effects to community connectedness and social support as well as the effects of noise and light are considered in the Socio-community section (Section 8.1) of this Report. For the EAO's assessment of potential effects of dredgeate disposal to the Human Health VC, please see Section 2.2.5 (Alternative Means of Undertaking the Project) of this Report. The assessment of potential effects to Human Health supports the assessment of potential effects to Socio-community (Section 8.1), Land and Marine Resource Use (Section 8.2), Health and Socio-Economic Conditions of Indigenous Peoples (Section 11.3) and Current Use (Section 11.4) of this Report.

MARINE SHIPPING ASSESSMENT

Human Health was included as a VC for the MSA because marine shipping may affect Human Health beyond the RAA of the original assessment area (that is, jetty to Sand Heads) from exposure to chemical emissions associated with marine shipping in the Salish Sea and the Strait of Juan de Fuca. The MSA evaluated potential adverse effects to Human Health through effects stemming from potential changes to soil, sediment, surface water, country food and air quality.

The MSA for Human Health incorporates conclusions found from the MSA of Air Quality (Section 5.1) and Greenhouse Gas Management (Section 5.2), Land and Marine Resource Use (Section 8.2), Current Use (Section 11.4) and Visual Quality (Section 8.3).

6.1.1.1 REGULATORY CONTEXT

The assessment of risk to the Human Health VC was evaluated using relevant federal and provincial risk assessment guidance provided by:

- The B.C. Ministry of Environment and Climate Change Strategy (ENV) (ENV 2017a, b);
- Health Canada (Health Canada 2010a, 2012); and
- The United States Environmental Protection Agency (US EPA 1989).

Section 5(1)(c)(i) of the CEAA 2012 is also relevant to the human health assessment as changes to the environment from TMJ could be linked to the health and socio-economic conditions of

Indigenous peoples (see Section 11.3 of this Report, Health and Socio-Economic Conditions of Indigenous Peoples).

In addition, this assessment relied on recommended exposure limits for airborne contaminants of potential concern (COPC) that are predicted to be released from TMJ. Referenced exposure limits include the California Environmental Protection Agency (CalEPA) - Office of Environmental Health Hazard Assessment, the Agency for Toxic Substances and Disease Registry, HC, Metro Vancouver, ENV, CCME, United States Environmental Protection Agency, World Health Organization, Ontario Ministry of the Environment, Conservation and Parks, and Texas Commission on Environmental Quality.

6.1.1.2 BOUNDARIES

The LAA for the Human Health VC includes a 10 km by 10 km area centered around the TMJ site boundary plus a one km buffer on each side of the navigation route between the TMJ site and Sand Heads. The RAA includes a 25 km (north-south) by 30 km (east-west) rectangle comprising the TMJ site and the LAA. The Human Health RAA corresponds to the Air Quality VC RAA (Section 5.1 of this Report). The Air Quality RAA was established to provide a regional context for the assessment of potential TMJ effects. The RAA also encompasses the area within which the residual effects of TMJ on Air Quality are likely to combine with the effects of other projects and activities to result in a cumulative effect.

MARINE SHIPPING ASSESSMENT

The LAA is defined as a 10 km buffer around the inbound and outbound marine shipping lanes within the MSA spatial boundary reflecting the area where TMJ associated vessels could interact with Human Health. The MSA RAA (MRAA) corresponds to the Salish Sea area which includes the southern part of the Georgia Strait, Rosario Strait, Middle Channel and Juan de Fuca Strait from south of Puget Sound to the 12-nautical mile limit. The RAA was defined to allow for selection of near-shore land-based receptor locations and is consistent with the Air Quality RAA. The human health MSA spatial boundaries are shown in Figure 4.5-1 of the MSA.

The MSA spatial boundaries include the northern part of the Olympic Peninsula and western parts of Washington, United States of America (USA). Health agencies in Canada and the USA report statistics in a different manner, which may constrain the direct comparisons of health indicators between the two countries.

6.1.2 POTENTIAL PROJECT EFFECTS AND PROPOSED MITIGATIONS IN THE APPLICATION

6.1.2.1 BASELINE INFORMATION AND POTENTIAL PROJECT EFFECTS

The Application conducted a review of existing conditions of concentrations of metals and polycyclic aromatic hydrocarbons (PAH) in soil, berries and fish tissue in the LAA and RAA. The review included information on water quality, sediment quality and air quality baseline data.

To determine the potential health effects of TMJ, a Human Health Risk Assessment (HHRA) was conducted to evaluate potential risks at receptor locations where people are known to be present, including communities, Indigenous harvesting areas and recreational areas that are in proximity of TMJ (the list of receptor locations is provided in Figure 9 of this Report). This was done by identifying the chemicals anticipated to be present in the emissions from TMJ, predicting the TMJ-related changes to environmental media (such as, soil, water, country foods and air) which people could be exposed to and estimating and assessing the risk these predicted changes could have on human health. The COPCs were selected by identifying the chemicals anticipated to be present in the emissions from TMJ which exceed their respective most stringent applicable screening criteria.

Two scenarios were identified in the Application to represent operations: 1) the Normal Operations Scenario which represents the typical operation at the facility (LNG carrier and bunker vessel calls and loading, security boat and tug activity as well as fugitive emissions from the pipeline); and 2) the Dredger Operations Scenario which represents the two-week period of maintenance occurring once per year where dredging takes place at the TMJ site (no LNG vessels would call during this period)

The Application stated that the potential primary pathways of effects on Human Health were determined to be changes to air quality, soil quality and country food (berries and game) quality. Considering mitigations, TJLP did not predict residual effects to water quality due to TMJ; therefore, exposure to surface water was not considered a primary pathway and not evaluated further in the Human Health assessment.

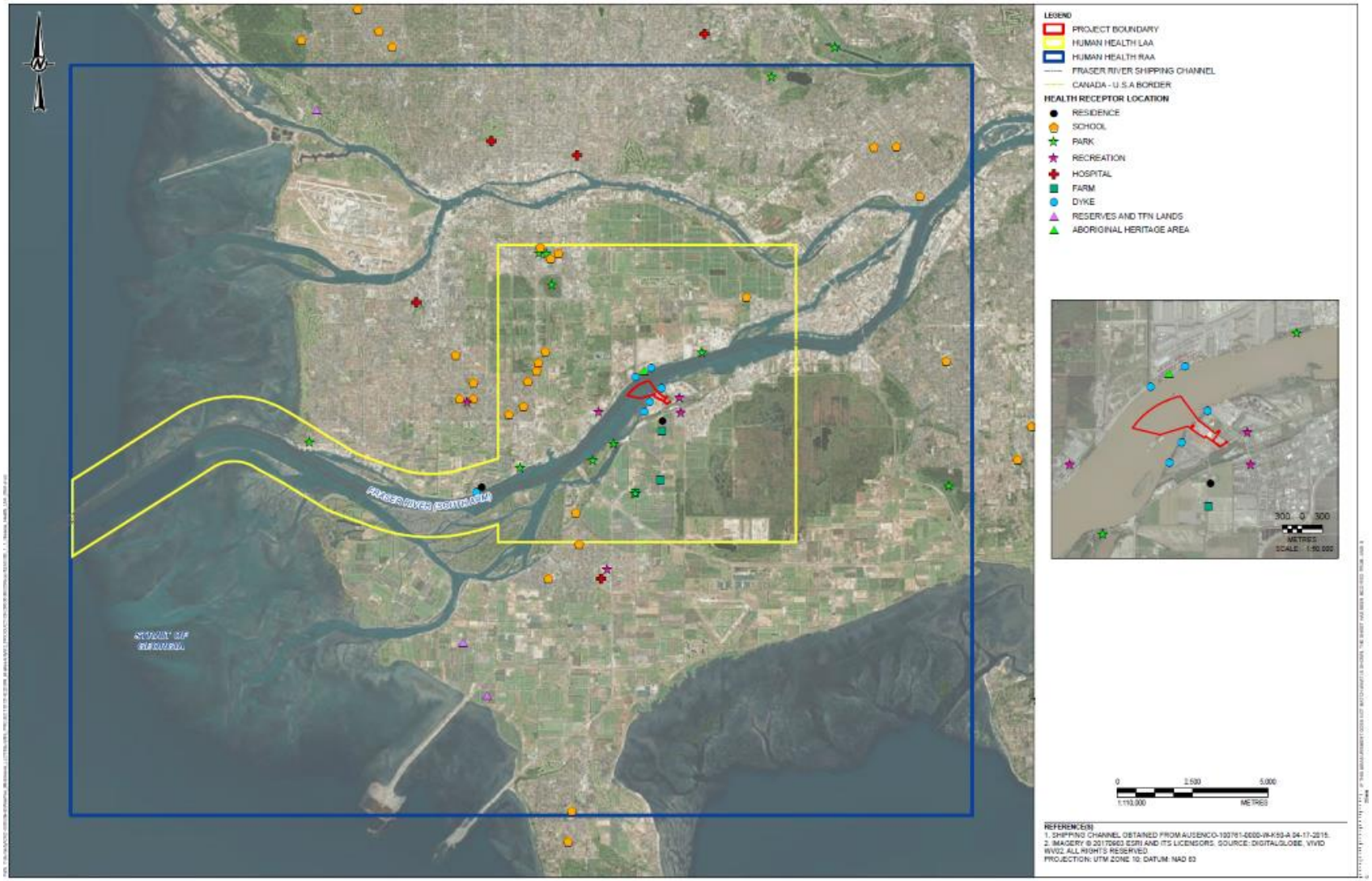

Figure 9: Human Health Receptor Locations for the original Application area (jetty to Sand Heads).

AIR QUALITY

Residents and people spending time in the RAA may be exposed to airborne contaminants emitted from TMJ (mainly from combustion exhaust from LNG carriers and bunker vessels, as well as fugitive emissions) through direct inhalation. Baseline information for air quality collected by TJLP includes metals, VOCs, PAHs and criteria air contaminants (e.g., PM, including PM_{10} and $PM_{2.5}$, NO_2 and SO_2).

The Application used Hazard Quotients (HQ) and Incremental Lifetime Cancer Risk (ILCR) as the two indicators to predict TMJ-related change to the Human Health VC. The HQ compares the potential concentration of a substance as a result of TMJ with human health exposure limits. HQs equal to or below 1.0 indicate negligible predicted adverse health effect. The residual effects analysis was completed using HQs calculated based on acute 1-hour exposure to the *maximum* predicted air concentration, which were based on conservative assumptions generally occurring for short durations. ILCRs indicate the increased risk attributed to constituent exposure above background cancer risks. ILCRs were calculated for substances identified as carcinogenic in the chronic inhalation assessment by comparing the *maximum* predicted concentrations with toxicity benchmarks.

Acute Inhalation Assessment

The acute inhalation assessment evaluated contaminants potentially emitted from TMJ that may have an adverse effect on Human Health following short-term (one-hour) exposure.

The HQs for NO_2 exceeded 1.0 at each of the 58 human health receptor locations in both the Dredger and Normal Operations Scenarios for the Baseline and Application Case (the CAAQS were used as the human exposure limit for NO_2). The Application Case (baseline plus project) Dredger Scenario HQs ranged from 1.1 to 2.0 at the human health receptor locations while Application Case Normal Operations Scenario HQs ranged from 1.1 to 2.6. Project Only HQs during the Dredger Scenario ranged from 0.00064 to 0.9 and 0.012 to 1.5 during the Normal Operations Scenario (Project Only HQs greater than 1.0 were identified at three human health receptor locations: maximum discrete receptor[99], Dyke North 1 and Tl'uqtinus[100]).

Application Case HQs for DPM ranged from 0.43 to 4.6 at the receptor locations (HQ of 4.6 at the maximum discrete receptor and Dyke North 1) and 9.6 at the maximum point of

[99] The maximum discrete receptor is the maximum concentration of the 1,090 sensitive receptor locations.

[100] The Application refers to this receptor location as 'Tl'uqtinus', however, this location is referred to as the 'former Indigenous village site' in the EAO's Assessment Report as multiple Indigenous have interest in this site.

impingement[101], benzo(a)pyrene HQs ranged from 0.046 to 2.1, cyclopenta(c,d)pyrene HQs ranged from 0.057 to 2.6, 2,5-dimethylbenzaldehyde HQs ranged from 0.037 to 1.6 and crotonaldehyde HQs ranged from 0.017 to 0.75 at the receptor locations and (exceeded 1.0 at the maximum point of impingement only (HQ = 1.6)). HQs for these constituents (except for crotonaldehyde, which exceeded at the maximum point of impingement only) exceeded 1.0 at 3 to 18 of the human health receptor locations.

Project Only HQs for DPM ranged from 0.094 to 4.2 (Project Only HQ of 4.2 at the maximum discrete receptor and Dyke North 1) and 0.046 to 2.1 for benzo(a)pyrene. Baseline Case HQs for DPM and benzo(a)pyrene were below 1.0. Baseline Case HQs were not calculated for cyclopenta(c,d)pyrene, 2,5-dimethylbenzaldehyde and crotonaldehyde as the predicted baseline concentrations were zero and not expected to be emitted from any of the existing facilities within the RAA. For this reason, Application Case and Project Only Case HQs for these constituents were the same. HQs for each receptor location and COPC can be found in Appendix 08.1-5 (Human Health Inhalation Risk Assessment Tables) of the Application.

The Application reported that while there are exceedances of the threshold HQ of 1.0 at certain human health receptor locations (indicating there are potential effects to human health), the effects are not significant as the predicted effects are highly conservative and the probability (percent of time per year) of an exceedance is low (ranging from 0.00071 percent to 3.1 percent).

Chronic Inhalation Assessment

The chronic inhalation assessment evaluated contaminants potentially emitted from TMJ that may have an adverse effect to human health following long-term exposure for two receptors, resident and recreational. The estimated HQs for the recreational receptor were below 1.0 and not discussed further. For the resident, Baseline Case HQs for NO_2 (based on the annual maximum air concentration) ranged from 1.0 to 1.1. The annual NO_2 Application Case HQs ranged from 1.0 to 1.1. The annual NO_2 Project Only Case HQs ranged from 0.00033 to 0.045. The potential health effects from chronic exposures to NO_2 include allergic reactions, asthma, and an increased susceptibility to respiratory infections. Chronic cadmium and chromium HQs were below 1.0 at each receptor location evaluated in the Baseline Case, Application Case and Project Only Case.

[101] The maximum point of impingement is the maximum concentration predicted within the RAA, outside of developed TMJ areas where public access is not restricted, and where the Ambient Air Quality Objectives apply (see Air Quality assessment Figure A-1 in Section 4.4). The Maximum Point of Impingement (MPOI) is considered to be a hypothetical “worst case” location and it did not overlap with any of the receptor locations.

The potential health effects from chronic exposures to cadmium and chromium include increased incidences of lung, tracheal and bronchus cancer. ILCRs for both the cadmium and chromium exceeded the threshold of $1x10^{-5}$ (1 in 100,000) at each receptor location evaluated in the Baseline and Application Cases. Baseline ILCRs were the same as the Application Case ILCRs indicating that current conditions are driving the increased ILCRs rather than emissions from TMJ.

SOIL QUALITY

Particulate matter containing constituents from dust generation or from incomplete combustion may deposit directly and accumulate onto soil in the LAA and RAA.

Baseline soil quality was determined through the analysis of soil data collected in July 2015 at 15 sample locations which were analyzed for metals and PAHs. These soil concentrations represent the baseline soil quality. Predicted surface soil concentrations as a result of TMJ were compared to soil quality guidelines. The predicted metal and PAH concentrations including the contribution from TMJ were found to be below the applicable soil quality guidelines and no constituents of potential concern were identified. Therefore, no exposure pathways to humans were identified.

COUNTRY FOODS - BERRIES

Particulate matter containing constituents from dust generation or from incomplete combustion may deposit directly onto berry surfaces in the LAA and RAA. Berries may also take up contaminants directly from the soil. Some constituents (for example, metals and PAHs) can accumulate in berries that are significant country food sources for local residents. Constituents of potential concern in berries were identified based on the soil data. No constituents of potential concern were identified in the baseline soil data or the predicted Application Case soil quality, therefore, there were no exposure pathways to humans identified through the ingestion of berries.

COUNTRY FOODS - GAME

Game (for example, mammals and birds) may ingest soil, surface water or vegetation from the LAA and RAA. Surface water quality is not expected to be affected by TMJ; however, changes to constituent concentrations in game tissue may occur if there are changes to soil and vegetation quality. No constituents of potential concern were identified in measured baseline or predicted Application Case soil or vegetation quality; therefore, no exposure pathway to humans was identified through the ingestion of game.

BUNKER VESSEL SCENARIO

For the air quality pathway, TJLP determined the list of COPCs defined in the Application did not change with the updated predictions for the BVS and there were no new COPCs identified due to changes in the predicted annual air quality concentrations for the BVS. For the BVS, the changes in the air quality predictions for the Application Case were negligible, with SO_2 increasing by <0.1 percent in the updated predictions and methane increasing by <0.1 percent. Concentrations of all other parameters either stayed the same or decreased compared to those presented in the Application. TJLP concluded that the comparative analysis confirmed that BVS does not result in changes to air quality that would affect the conclusions of the Human Health Assessment presented in the Application.

For the multimedia pathway, TJLP evaluated predicted deposition rates and determined that the BVS would not result in an increase in deposition rates (i.e., deposition of COPCs onto soil and country foods would not increase) from what was assessed in the Application. TJLP concluded that a quantitative multimedia analysis was not warranted.

MARINE SHIPPING ASSESSMENT

Air quality was determined to be the only primary pathway to potential effects on human health for the MSA area. Constituents considered in the assessment were those identified to be emitted by TMJ-related marine shipping which include carbon monoxide (CO), NO_2, SO_2, $PM_{2.5}$ and PM_{10}. Concentrations of CO, SO_2, and PM_{10} were below the respective one-hour and 24-hour air quality thresholds and were therefore not carried forward in the assessment. The MSA evaluated the short-term (acute) health effects. Long-term (chronic) exposure health effects from these constituents were not evaluated because the TMJ-related vessel traffic is small compared to the existing marine traffic. The TMJ vessels are transient and an intermittent emission source with respect to individual receptor locations on an annual basis.

Air concentrations for NO_2 and $PM_{2.5}$ were predicted for two scenarios; Normal Case (emissions from LNG-powered vessel and escort tug) and Abnormal Case (worst case scenario, considering emissions from a diesel-powered vessel and escort tug). One-hour NO_2 Baseline Case HQs were below 1.0 at each receptor location ranging from 0.60 – 0.97. Application Case HQs were above 1.0 at all receptor locations except at two locations during the Normal Case (ranging from 0.67 – 1.9) and exceeded 1.0 at all receptor locations during the Abnormal Case (ranging from 1.2 – 3.6). 24-hour $PM_{2.5}$ HQs for the Baseline and Application Case were similar (ranging from 0.67 to 1.3) during both the Normal and Abnormal Cases indicating the existing concentrations in the MSA area are the main contributor to $PM_{2.5}$, not TMJ.

6.1.2.2 MITIGATION MEASURES PROPOSED IN THE APPLICATION

The Application noted that mitigation measures proposed for Water Quality in Section 5.5 of this Report and Air Quality in Section 5.1 of this Report are classified as highly effective and were factored into the Human Health assessment and are expected to mitigate potential effects on Human Health. TJLP did not propose monitoring plans specific to Human Health as the mitigation measures for Water Quality and Air Quality would address the key pathways of exposure that have the potential to affect human health.

The Application proposed to develop an Air Quality Management Plan that would include measures to manage air emissions and fugitive dust during construction, operations and decommissioning. The following BMPs to address air emissions were proposed under the plan:

- Ongoing routine maintenance of vehicles and implement engine idling time restrictions where practical on vehicles/ vessels during construction;
- Reducing emissions as far as possible from marine vessels by reducing engine use whenever practicable during operations; and
- Implementing an appropriately designed leak detection and repair program for the project LNG conveyance system.

No additional mitigation measures were proposed by TJLP as part of the BVSA.

6.1.3 POTENTIAL PROJECT EFFECTS AND PROPOSED MITIGATIONS IDENTIFIED DURING APPLICATION REVIEW

The following key issues related to the assessment of Human Health for TMJ were identified during Application review and based on feedback from the Working Group:

- A quantitative carcinogenic evaluation of risks associated with exposure to DPM;
- Inclusion of a quantitative evaluation of $PM_{2.5}$ in the Human Health Assessment; and
- Residual effects of one-hour NO_2 and 24-hour $PM_{2.5}$.

DIESEL PARTICULATE MATTER CARCINOGENIC RISK CALCULATION

HC expressed concerns that a carcinogenic risk assessment was not completed for DPM, as background exposure concentrations themselves may be sufficient to be associated with adverse health effects. HC suggested potential health risks be characterized using the CalEPA approach for a quantitative assessment or using a robust qualitative assessment.

> In response to HC's request, TJLP provided a quantitative evaluation of carcinogenic risks from exposure to DPM to determine if DPM as a carcinogen would pose an adverse health effect to humans following chronic exposure. TJLP concluded that both the Baseline and Application Case ILCRs exceeded the threshold of 1 in 100,000 ($1x10^{-5}$) at

each receptor location. The Application Case ILCRs were similar to Baseline Case ILCRs indicating that TMJ's overall contribution to DPM is minimal. TJLP stated that these predictions are considered highly conservative as diesel powered vessels were used in the modelling (i.e., to predict air concentrations), whereas TJLP is expecting at least 90 percent of vessels called to be LNG powered, greatly reducing DPM emissions. Overall, TJLP found the residual effect of exposure to DPM negligible and not significant.

The EAO is of the view that the issue discussed is adequately resolved for the purposes of the EA. In the modelling conducted for the Application, TJLP assumed that the number of crude oil-based fueled LNG carriers calling to TMJ would be no greater than 10 percent, which would reduce DPM emissions. The EAO is proposing Condition 19: Air Quality Management Plan, which would include mitigation measures TJLP would implement to reduce adverse effect to air quality, require TJLP to estimate or measure air quality parameters attributable to TMJ, and include triggers that would cause TJLP to take corrective action to reduce air quality parameters. The EAO is also recommending a KMM under CEAA 2012 for an Air Quality Management Plan, which would include how TJLP is participating in the identification and implementation of regional environmental management measures and cumulative effects monitoring to manage Air Quality.

INCLUSION OF $PM_{2.5}$ IN THE HUMAN HEALTH ASSESSMENT

HC recommended that $PM_{2.5}$ be carried forward into the Human Health assessment for the original assessment area (that is, jetty to Sand Heads) as a COPC because it is a non-threshold contaminant, meaning there is no threshold below which there would be no potential for adverse health effects as per HC's Air Quality guidance. HC suggested that the consideration of $PM_{2.5}$ would aid in the implementation of proper mitigation measures and monitoring requirements as well as the development of best practices and follow-up programs.

In response to HC, TJLP stated that they agree with the management portion of the request, but because there are already regional comprehensive monitoring plans and no predicted exceedances of $PM_{2.5}$ due to TMJ (which is why $PM_{2.5}$ did not screen in as a COPC for the human health assessment), TJLP is unsure if monitoring on a project specific level would be appropriate. TJLP also noted that there are no additional mitigation measures they could add to reduce $PM_{2.5}$ emissions from vessels in response to $PM_{2.5}$ monitoring as the vessels are not owned by TJLP.

The EAO is of the view that inclusion of $PM_{2.5}$ in the Air Quality assessment and not the Human Health assessment for the original assessment area is sufficient in assessing the adverse residual effects as 24-hour $PM_{2.5}$ is only predicted to increase to 26 percent of the air quality objective; annual concentrations are not predicted to increase at all. Additionally, it is the EAO's understanding that this is a highly conservative assessment which uses diesel fueled vessels in

the modelling calculations when TJLP estimates that most of the vessels would be LNG powered (minimum 90 percent). The EAO is proposing Condition 19: Air Quality Management Plan and recommending a KMM under CEAA 2012 for an Air Quality Management Plan which would include mitigation measures to reduce adverse effects to air quality. The EAO is of the view that monitoring $PM_{2.5}$ as part of the already existing regional comprehensive monitoring plans is sufficient and not required on a project-specific level. 24-hour $PM_{2.5}$ was included in the MSA and found that 24-hour $PM_{2.5}$ HQs for the Baseline and Application Case are similar (ranging from 0.67 to 1.3) during both the Normal and Abnormal Cases indicating the existing concentrations are the main contributor to $PM_{2.5}$, not TMJ.

Residual Effects of One-hour NO_2 and 24-hour $PM_{2.5}$

Health Canada raised concerns about predicted one-hour NO_2 exceedances. Health Canada is of the view that there is no lower-limit threshold for population health effects from exposure to NO_2 and that health risks exist below the guidelines. Health Canada encouraged TJLP to propose mitigation measures not only to meet the standards, but also target reducing population exposure to NO_2 associated with TMJ to the extent technically and economically feasible.

> TJLP provided a supplemental memo[102] on the NO_2 assessment which is discussed in more detail in Section 5.1.3 (Air Quality) of this Report. TJLP noted that in the air quality assessment, predictions were conservatively based on the largest diesel operated LNG carrier, with the longest LNG loading duration and the maximum one-hour NO_2 emission rates. In reality, most vessels would be LNG powered with varying engine sizes. Maximum emission rates were modelled as if continuous, when in reality, the maximum emissions would only occur when LNG vessels are berthing and departing (only 0.16 percent of the year) leading to a reduction in likelihood of one-hour NO_2 concentrations being as high as modeled in the Application.
>
> The EAO is satisfied that this issue is adequately resolved for the purposes of the EA. The EAO is proposing Condition: 19: Air Quality Management Plan, which would include mitigation measures TJLP would implement to reduce adverse effects to air quality, require TJLP to estimate or measure air quality parameters attributable to TMJ, and include triggers that would cause TJLP to take corrective action to reduce those parameters. The EAO is also recommending a KMM under CEAA 2012 for an Air Quality Management Plan, which would include how TJLP is participating in the identification

[102] TJLP's NO_2 Supplemental Memo, dated September 16, 2019 (https://projects.eao.gov.bc.ca/api/public/document/60a49221148b4a00233060fa/download/20190916_ECCC_MV_OGC_TWN_AQ_NO2%20Assessment.pdf).

and implementation of regional environmental management measures and cumulative effects monitoring to manage air quality, including relevant initiatives that might exist in the future that have a role for marine terminal operators. The EAO also recommends a non-LNG vessel limitation KMM under CEAA 2012, requiring that the number of LNG vessels, excluding LNG barges driven by tugs, calling on the jetty that use crude oil-based fuels (such as diesel) as their primary fuel shall not exceed 13 calls annually. This KMM captures TJLP's assumption used in the air quality analysis in the Application that up to 10% of the 137 vessel calls would be diesel-powered.

For the MSA, The Agency raised concerns that the predicted concentrations for NO_2 and $PM_{2.5}$ exceed the HQ threshold of 1.0 in several receptor locations and requested further rationale from TJLP as to why these effects are considered negligible. Additionally, Fraser Health requested further information from TJLP regarding the significance for these potential HQ exceedances on human health.

In response, TJLP stated that the characterization of residual effects takes into consideration the results of the HHRA. Under the Normal Case, the estimated HQs were less than one for the Project Only Case, indicating that risks from exposure to NO_2 and $PM_{2.5}$ from TMJ by itself are negligible. The Application Case HQs were negligible to low, meaning that the risk to human health is low. TJLP also outlined the conservative assumptions used to predict the HQs including using the most conservative objectives (the CAAQS) which uses values associated with air shed targets, modelling emission levels based on vessels with the largest engine size and using the most conservative screening model.

Based on the low risk to human health in the MSA, the conservative assumptions used in the screening model and the low frequency and duration exceedances of the HQ threshold of 1.0, the EAO is of the view that the rationale for negligible effects on human health through air quality is satisfactory and that this issue is adequately resolved for the purposes of the EA. The EAO does not propose any related conditions specific to the issue identified.

6.1.4 THE EAO'S ANALYSIS AND CONCLUSIONS

This section presents the EAO's conclusions on the potential adverse residual effects from TMJ on the Human Health VC.

The EAO evaluated the potential effects to the Human Health VC by considering construction, operations and decommissioning activities that could affect human health.

Proposed Provincial Conditions and Key Mitigation Measures (CEAA 2012)

Based on mitigations proposed in the Application and issues raised during Application review for air quality, the EAO proposes the following provincial conditions and recommends KMMs under CEAA 2012 for air quality that would also apply to human health:

- Condition 10: Construction Environmental Management Plan (provincial condition);
- Condition 11: Operations Environmental Management Plan (provincial condition); and
- Condition 19: Air Quality Management Plan (provincial condition) and Air Quality Management Plan (KMM) with best management practices to mitigate effects on air quality.

Residual effects: After considering the proposed mitigation measures to the air quality pathway, the EAO concludes that TMJ would result in the following residual adverse effects to the Human Health VC for the Application scenario and BVS:

- Acute inhalation exposure to:
    - Nitrogen Dioxide (Normal Operations Scenario);
    - Diesel Particulate Matter;
    - Benzo(a)pyrene;
    - Cyclopenta(c,d)pyrene; and
    - 2,5-dimethylbenzaldehyde.

The EAO concludes that the residual effects of one-hour acute exposure to NO_2 (Dredger Scenario) and crotonaldehyde as well as annual chronic exposure to NO_2 (Normal Operations Scenario), cadmium and chromium would be negligible and are therefore not carried forward to significance determination. The EAO came to this conclusion because these COPCs were screened through based on a conservative threshold. They also either do not exceed provincial objectives or their probability of exceedance is very low (for example, 0.00071 percent chance exceedance for crotonaldehyde during Normal Operations Scenario).

Due to the conservative nature of the air quality predictions and considering most of the contributions are from existing conditions, the EAO concludes that effects for one-hour NO_2 and 24-hour $PM_{2.5}$ in the MSA area are negligible and are therefore not carried forward for significance determination.

The EAO acknowledges Health Canada's perspective that TMJ's contribution to NO_2 represents a cumulative effect in an area where NO_2 concentrations already equal or exceed guidelines.

The EAO's characterization of the expected residual effects of TMJ on human health is summarized below, as well as the EAO's level of confidence in the effects determination (including their likelihood and significance).

Table 25: Summary of Residual Effects to Human Health

Criteria	Assessment Rating	Rationale
Context[1]	Low - Moderate resilience	Effects of NO_2 on human health are characterized as low resiliency and are sensitive to existing conditions as the Baseline Case HQs of NO_2 exceeds the threshold of 1.0 and Project Only Case HQs are below 1.0 at most locations evaluated. Effects of DPM, benzo(a)pyrene; cyclopenta(c,d)pyrene and 2,5-dimethylbenzaldehyde on human health have moderate resiliency (not sensitive to existing conditions) as Baseline Case HQs are below the threshold of 1.0.
Magnitude[2]	Moderate	As a result of TMJ, Application Case NO_2, DPM, benzo(a)pyrene, cyclopenta(c,d)pyrene and 2,5-dimethylbenzaldehyde HQs are predicted to exceed the established acute threshold of 1.0, ranging from 1.1-4.6 (range of HQs excludes the maximum point of impingement), at the maximum exposure at several of the human health receptor locations. At the maximum point of impingement, the DPM HQ is 9.6 with a probability of exceedance at 0.089 percent. For the BVS, concentrations stayed the same or decreased compared to those presented in the Application.
Extent	Local	Effects on Human Health from TMJ are expected to be localized within the LAA at receptors locations nearest to the TMJ facility.
Duration	**Normal Operations:** Long-term **Dredger Operations:** Short Term	The duration of the effect of TMJ on Human Health during the Normal Operations scenario is classified as long-term as effects would persist throughout the entire life-span of TMJ but are not expected to surpass that. The duration of the effect of TMJ on Human Health during the Dredger Operations scenario is classified as short-term as effects would persist for up to two weeks per year during operations.
Reversibility	Reversible to Irreversible	It is expected that air quality would return to its pre-operation conditions following the closure of TMJ. Effects on human health from short-term exposure to air contaminants would generally be reversible; however, effects on human health from chronic exposures may be irreversible.
Frequency	**Normal Operations:** Frequent **Dredger Operations:** Infrequent	The greatest emission sources, such as LNG bunker vessels and carriers, during the Normal Operations Scenario are not continuous but would be present frequently in the LAA and RAA. Dredging would only occur once for a duration of up to two weeks per year during operations.
Likelihood	There is a low likelihood that TMJ would have an adverse residual effect on the Human Health VC, for the Application scenario or BVS. The probability of the predicted exceedances of benzo(a)pyrene, cyclopenta(c,d)pyrene and 2,5-dimethylbenzaldehyde in a given year are less than 0.05 percent at the receptor locations evaluated, for both the Application scenario and BVS. The predicted probability of exceedance for the one-hour NO_2 ranges from 3.1 percent to 8.3% in a given year, for the Application scenario and BVS, respectively. The probability of the predicted exceedance of DPM in a given year are less	

Criteria	Assessment Rating	Rationale
	than 0.05 percent and 0.25 percent in a given year, for the Application scenario and BVS, respectively. The predicted air concentrations evaluated in the assessment were based on maximum emission rates (i.e., peak emissions and maximum vessel sizes), which are not representative of exposures throughout the entire life of TMJ.	
Significance Determination	In consideration of the conditions identified in the TOC and recommended KMMs under CEAA 2012 as well as the conservative nature of the assessment, the EAO concludes that TMJ would not have significant adverse residual effects on the Human Health VC.	
Confidence	Air quality predictions used the maximum emission rates, however, most of the equipment would not be operating at maximum capacity on a continuous basis. The predicted HQs are considered highly conservative as these compounds screened in as a COPC based on conservative thresholds and the concentrations used to estimate the HQs were highly conservative. One-hour predictions were based on peak hour emissions which are not expected to occur throughout the year. Maximum vessel size was used for all carriers it is assumed that all LNG carriers would be diesel powered while only up to 10 percent of vessels are expected to be diesel powered with the remaining 90 percent (or more) powered by LNG, which would reduce emissions. For the BVS, the highest emitting of the two bunker vessels assessed during operations activities (i.e., berthing, loading, departing) were used for the air quality assessment. In reality, TJLP anticipates a mix of LNG and diesel-powered bunkers. These conservative assumptions produce an overestimate of the potential effects. Considering this, and Air Quality mitigation measures in Section 5.1 of this Report which are classified as highly effective, the EAO has a high level of confidence that residual effects have not been underestimated. However, due to uncertainties around the air thresholds and the air quality predictions, the overall level of confidence for the Human Health assessment is moderate.	

NOTES:

1. **Context -** In the case of the HHRA, context is the comparison of the Application Case risk estimates to those of the Baseline Case to evaluate changes that could be attributed to TMJ.
2. **Magnitude** – In the case of the HHRA, this is identified based on calculated HQs and ILCRs.

6.1.5 CUMULATIVE EFFECTS ASSESSMENT

The Application stated that it was not possible to conduct a quantitative cumulative effects assessment for Human Health because there was not enough information available to conduct air quality modelling for other certain and reasonably foreseeable projects and activities. Please see Air Quality (Section 5.1) of this Report for a qualitative analysis of cumulative effects on the Air Quality VC.

Benzo(a)pyrene, cyclopenta(c,d)pyrene and 2,5-dimethylbenzaldehyde emissions result from diesel combustion in marine vessels. Benzo(a)pyrene emissions also occur from the adjacent Fortis facility (in the Application Case), although the emissions are much lower than the Project Only emissions. Potential interactions could occur with the VAFFC, the proposed Delta Grinding Facility and the proposed expansion of the Tilbury Seaspan ferries jetty as operation of these projects are likely to contribute emissions of benzo(a)pyrene, cyclopenta(c,d)pyrene and 2,5-

dimethylbenzaldehyde at a level that may generate residual effects. Exposure to benzo(a)pyrene, cyclopenta(c,d)pyrene and 2,5-dimethylbenzaldehyde may result in respiratory effects. Since these emissions are caused by combustion of diesel in marine vessels, the interaction would be intermittent. The interaction with VAFFC would be infrequent as only one marine vessel is expected every two weeks. The residual cumulative effects for benzo(a)pyrene, cyclopenta(c,d)pyrene and 2,5-dimethylbenzaldehyde are not considered significant.

6.1.6 CONCLUSIONS

Considering the above analysis, and having regard to the mitigation measures identified in the provincial TOC including Condition 10: Construction Environmental Management Plan, Condition 11: Operations Environmental Management Plan and Condition 19: Air Quality Management Plan (which could become legally binding as conditions of the provincial EAC) and KMMs under CEAA 2012 for an Air Quality Management Plan (Appendix 1), the EAO is satisfied that TMJ would not have significant adverse residual or cumulative effects on the Human Health VC.

6.2 NOISE

6.2.1 BACKGROUND

Noise was selected as a VC based on its importance to Indigenous Groups, regulators and the public. Results of the noise assessment are incorporated into the assessment of potential effects to Wildlife and Wildlife Habitat and Marine Birds (Section 5.9), Socio-Community (Section 8.1), Land and Marine Resource Use (Section 8.2), Federal Lands, Other Provinces, and Outside Canada (Section 11.1), Health and Socio-Economic Conditions of Indigenous Peoples (Section 11.3) and Current Use (Section 11.4) of this Report.

The Application assessed the change in atmospheric noise due to TMJ construction and operations, related to daytime and nighttime noise levels, frequencies of noise level and percentage of highly annoyed people (%HA). Decommissioning-related noise effects were considered equal or similar to those noise effects for construction.

The Noise VC was not included in the MSA, because the Application concluded no residual effects to the noise environment from LNG carrier vessels moving in the shipping lanes in the Fraser River. As such, no interactions were predicted for the MSA area as the only TMJ activity in the MSA would be vessel movement.

6.2.1.1 REGULATORY CONTEXT

In support of the assessment, TJLP considered regulatory information from the following sources:

- BC OGC Liquefied Natural Gas Facility Regulation (Regulation);
- BC OGC's British Columbia Noise Control Best Practices Guideline (BC OGC Guideline);
- Health Canada's Guidance for Evaluating Human Health Impacts in Environmental Assessment: Noise (Health Canada Guidance);
- City of Delta's Noise Control Bylaw; and
- City of Delta's Zoning Bylaw.

6.2.1.2 BOUNDARIES

The LAA for Noise includes a 1.5 km buffer from the TMJ site boundary and a 1 km buffer that extends along either side of the shipping route, from the TMJ site boundary, ending at Sand Heads. The RAA includes the 3 km buffer from the TMJ site boundary and a 1.5 km buffer that extends from the TMJ site boundary along either side of the shipping route, ending at Sand Heads.

Four noise assessment receptors also referred to as noise monitoring sites, were identified in the LAA (Figure 10). The noise assessment receptors varied in distances of 150 to 1,300 m from the TMJ site boundary which included:

- Receptor 1 (R1) – Residence 440 m south of the TMJ site boundary;
- Receptor 2 (R2) – Animal shelter 150 m southeast of the TMJ site boundary;
- Receptor 3 (R3) – Indigenous village site located 300 m north of the TMJ site boundary; and
- Receptor 4 (R4) – Residence 1,300 m southwest of the TMJ site boundary and within 300 m of the shipping route.

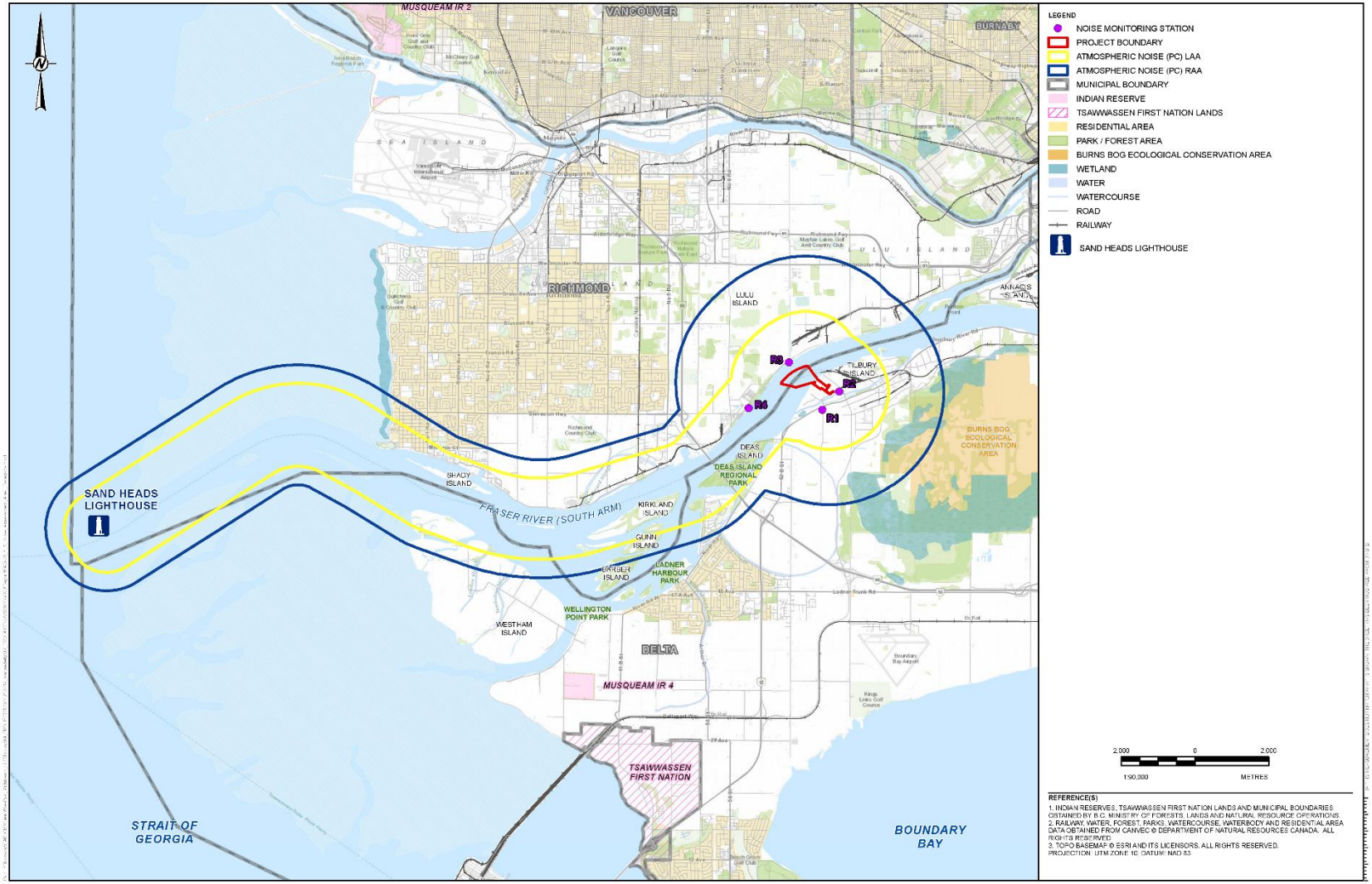

Figure 10: Noise Assessment Areas and Receptors for the original Application area (jetty to Sand Heads).

6.2.2 POTENTIAL PROJECT EFFECTS AND PROPOSED MITIGATIONS IN THE APPLICATION

6.2.2.1 BASELINE INFORMATION AND POTENTIAL PROJECT EFFECTS

The existing conditions are considered the Baseline Case for the acoustic environment and the factors influencing noise. The Baseline Case measured noise sources from natural elements and existing facilities and activities in the RAA using field level measurements at the four assessment receptors (designated noise monitoring sites).

The Application considered the noise generated during construction to be temporary with a variability in noise emission levels at the receptors. The potential for adverse residual effect is predicted to occur in the construction of the FTBB and jetty at the R3 monitoring site. R3 is located on the shoreline, described as an industrial area with no residential dwellings.

The Application predicted noise levels without mitigations and concluded moderate magnitude residual effects for the increase in noise during construction. The effect on speech comprehension[103] is predicted to have a low magnitude effect at R3. The effect on sleep disturbance was predicted to be moderate at R3. Decommissioning activities are expected to be similar to those during construction.

Operational noise[104] was estimated as equivalent over daytime and nighttime periods. The Application predicted that the noise generated during operations would have no potential adverse effects at the monitoring sites R1, R2, R3 and R4. Operational activities through all three scenarios (i.e., an LNG bunker vessel loading at the FTBB; an LNG carrier loading at the jetty; and maintenance dredging), represented a negligible likelihood of a residual effect occurring resulting from an increase in operational noise.

BUNKER VESSEL SCENARIO

In the BVSA, TJLP noted that noise is assessed over the daytime or nighttime periods and the noise modelling scenarios considered in the Application were established based on the expected capacity of TMJ at a given time (i.e., a maximum of two vessels at berth, plus vessels arriving, departing, and transiting along the route). TJLP stated that the maximum scenario remains unchanged with the proposed increase in annual bunker vessel movements (i.e., no more than two LNG vessels would be present at TMJ at any particular time and therefore no additional vessels would arrive, depart, or transit along the shipping route in the daytime or

[103] Health Canada Guidance indicates outdoor noise levels above 55 dBA interferes with speech comprehension. Application noise levels greater than 55 dBA is associated with potential adverse effects.

[104] Noise levels during Operations are calculated through the logarithmic addition of the ambient sound level, established through baseline noise monitoring, and the predicted operations noise level.

nighttime periods modelled in the maximum scenario). TJLP concluded that the daytime or nighttime predicted noise levels due to this maximum scenario and the corresponding residual effects characterization would not change with the BVS compared to the Application. TJLP predicts the increase in annual bunker vessels would result in a negligible effect on Noise.

6.2.2.2 MITIGATION MEASURES PROPOSED IN THE APPLICATION

The Application proposed the following mitigation measures to address potential noise effects:

- Development of a Noise Management Plan, as part of the Construction Environmental Management Plan, including:
  - Advising nearby residents of noise generating activities and scheduling these events to reduce disruption;
  - Establishing heavy equipment muster points at least 500 m from any residential dwelling;
  - Fit equipment with standard mufflers or silencers and maintaining these mufflers/ silencers in good working order; and
  - Take advantage of acoustics screening from existing on-site barriers to shield dwellings from construction equipment noise.
- Development of a Noise Management Plan, as part of the Operations Environmental Management Plan, including:
  - Schedule noise-emitting maintenance activities during the day whenever possible;
  - Notify residents prior to high noise-emitting maintenance activities where appropriate; and
  - Set up and implement a call-in number that people can call when experiencing high noise activity that includes response and follow-up procedures.

No additional mitigation measures were proposed by TJLP as part of the BVSA.

6.2.3 POTENTIAL PROJECT EFFECTS AND PROPOSED MITIGATIONS IDENTIFIED DURING APPLICATION REVIEW

The following key issue related to the assessment of Noise for TMJ were identified during Application review and based on feedback from the Working Group.

CONSTRUCTION NOISE MODELLING AND CONFIDENCE

Cowichan Nation Alliance expressed concerns related to the level of detail provided in TJLP's proposed noise monitoring program, and concerns relating to the confidence of the predictive modelling inputs of the sound emissions of the LNG carriers. Cowichan Nation Alliance suggested the Low Frequency Noise (LFN) had been underestimated for TMJ and requested that TJLP commit to ensuring all sound sources are less than estimated and that noise levels be validated by surveys. HC raised concerns with the baseline noise levels that exceeded existing

guidance limits and thresholds and suggested that a complaint resolution process be implemented for construction, similar to what has been proposed during operations.

> TJLP responded, clarifying their interpretation of the American National Standards Institute (ANSI S12.9-2005) annoyance calculation noting that annoyance is minimal when octave band sound pressure levels are below 65 dB at 31.5 and 63 hertz (Hz). TJLP confirmed that measured spectral data at R3 noise levels in the 31.5 and 63 Hz octave bands are below 65 dB and that most monitoring equipment does not measure the 16 Hz octave band. TJLP also responded that conservative assumptions were made in the modelling to reflect a worst-case scenario. TJLP also noted that they would consider implementing a complaint resolution process for construction and operations.

The EAO is proposing noise and vibration mitigations as part of Condition 10: Construction Environmental Management Plan and Condition 11: Operations Environmental Management Plan and is recommending a Noise Management Plan as a KMM under CEAA 2012. These would include the noise mitigations noted in Section 6.2.2.2 above and a complaint resolution procedure. Additionally, the EAO is proposing Condition 15: Public Information to apprise the public of TMJ activities and to provide a means to solicit and receive feedback.

6.2.4 THE EAO'S ANALYSIS AND CONCLUSIONS

This section presents the EAO's conclusions on the potential adverse residual effects from TMJ on the Noise VC.

The EAO evaluated the potential effects to noise by considering construction, operations and decommissioning activities that could affect the noise environment from increased noise levels due to increased marine construction, marine vessel traffic, and vessel birthing, loading, and departing.

Proposed Provincial Conditions and Key Mitigation Measures (CEAA 2012)

Based on mitigations proposed in the Application and issues raised during Application review, the EAO proposes the following provincial conditions and recommend KMMs under CEAA 2012:

- Condition 10: Construction Environmental Management Plan and Condition 11: Operations Environmental Management Plan (provincial conditions), capturing noise management measures described in Section 6.2.2.2;
- Noise Management Plan, including a complaint resolution process (KMM); and
- Condition 15: Public Information to provide information to the public on TMJ activities and a means to solicit and receive feedback (provincial condition).

Residual Effects: After considering the proposed noise mitigation measures, the EAO concludes that TMJ would result in the following residual adverse effects to the Noise VC for the Application scenario and BVS:

- Increase in noise levels during construction and decommissioning.

The EAO's characterization of the expected residual effects of TMJ on the Noise VC are summarized below in Table 26 and reflect the EAO's level of confidence in the effects determination (including their likelihood and confidence).

Table 26: Summary of residual effects for Construction and Decommissioning Noise

Criteria	Assessment Rating	Rationale
Context	Moderate - High Resilience	The TMJ site boundary has a moderate to high resiliency to noise disturbances as the location is set in an established urban and industrial area associated with a transportation corridor and shipping lane. However, there are a few receptor-sites near the TMJ site boundary that are more sensitive to a change in the noise environment.
Magnitude	R1 – Negligible R2 – Negligible R3 – Negligible to Low R4 – Negligible	An increase in noise during construction and decommissioning is expected to occur but remain within regulatory criteria with the application of mitigation measures at the assessment receptors R1, R2 and R4. Effects to the noise environment would be largely mitigated by noise barriers/ screens and the implementation of mitigation measures at the source of the noise and at the sensitive receptors. Without mitigation, Application noise levels at R3, the Indigenous village site, during construction are expected to increase by 4 dBA and 5 dBA for daytime and a 7 dBA noise increase for nighttime. Noise annoyance (%HA) is also expected to increase by 7.0 percent and 7.7 percent during construction, without mitigation. A negligible to low magnitude is expected for the assessment receptor R3 during construction with mitigation applied, as it is expected to be closer to baseline noise levels.
Extent	Local	Effects to noise from TMJ are expected to be localized within the LAA during construction and decommissioning. In particular, noise levels would be more perceptible closer to the noise sources such as at R3, the Indigenous village site. Any noise level exceedances would be restricted to the LAA.
Duration	Short to Medium term	Construction (3 years) and decommissioning (1 year) noise would be short to medium term with noise effects present for the duration of construction and decommissioning and is not expected to persist past the duration of TMJ.
Frequency	Frequent	Noise effects from construction would occur regularly over 2 to 3 years. Frequent construction noise may occur for up to 24 hours per day. Decommission activities would be similar to that of the construction activities but would occur over a duration of 1 year.
Reversibility	Reversible	Noise effects from construction and decommissioning activities are considered reversible as noise levels are expected to return to pre-project baseline levels upon completion of the activities.
Likelihood	The likelihood that there would be an effect to the noise environment from construction and decommissioning activities is high.	

Criteria	Assessment Rating	Rationale
Confidence	The EAO's confidence in this assessment is moderate. There is some uncertainty with regards to the conservative inputs for the modelling predictions, and some baseline measurements exceeded HC's 55 dBA limit at the R1 receptor site under the existing conditions primarily due to existing vehicle traffic and intermittently airplane traffic.	
Significance	In consideration of the provincial conditions identified in the TOC and KMMs under CEAA 2012 (listed in Appendix 1) as well as the conservative nature of the predicted effects, the EAO concludes that TMJ would not have significant adverse residual effects on the Noise VC.	

Note: Criteria and assessment ratings are defined in Appendix 5: Residual Effects Characterization Definitions.

6.2.5 CUMULATIVE EFFECTS ASSESSMENT

The Application considered past, present and reasonably foreseeable future projects in the cumulative effects assessment. The Fraser Surrey Docks Direct Transfer Coal Facility, PBRP, RBT2, VAFFC, Fraser River Tunnel Project, VFPA Habitat Enhancement Program, TMX, Delta Link Business Park and Deas Island BC Hydro Transmission Line were all considered in the cumulative effects assessment. The Application determined that these projects did not have any potential interaction with TMJ due to either the distance to TMJ or no spatial overlap of effects on noise. The Application identified FortisBC's Tilbury Phase 1 LNG Expansion Project operations to have the potential to act cumulatively with TMJ's residual effects for the Noise VC.

The EAO has also considered the proposed Delta Grinding Facility on Tilbury Island and concluded that there would be no overlap between the construction phases of TMJ and this project as Delta Grinding is at an earlier phase in the EA process. Tilbury Phase 2 LNG Expansion Project was also considered in the cumulative effects assessment, which was not included in TJLP's Application. The EAO does not have specific predictions for the Tilbury Phase 2 LNG Expansion Project; however, it is reasonable to assume that the projects could interact cumulatively if there is overlap during construction. The EAO also notes that Tilbury Phase 2 LNG Expansion Project is subject to an EA and potential effects would be assessed in that EA process.

Noise from the Tilbury Phase 1 LNG Expansion Project was assessed based on the expectation that the facility would meet the BC OGC Guideline at the assessment receptors after completion of the expansion project. The Tilbury Phase 2 LNG Expansion Project would expand LNG storage and liquefaction capacity at the existing FortisBC Tilbury LNG facility in Delta, B.C. directly adjacent to TMJ. The Application considered that this project's operations may temporarily overlap with the construction phases of TMJ.

The Application characterized the residual cumulative effect with TMJ as moderate in magnitude during construction, and a 7.8 - 8.4 percent increase in noise annoyance (%HA) due

to the increase in noise levels. The effect on speech comprehension was predicted to have a low magnitude at R1, and moderate at R2 and R3, measured daytime baseline noise level. The effect on sleep disturbance was predicted to be moderate at R2 and R3 and low at R4 monitoring sites as nighttime noise did not exceed the measured baseline noise level by more than 10 dB. Nighttime baseline noise levels at all the four monitoring sites exceeded the Health Canada Guidance nighttime limit of 45-dBA. Health Canada noted that TJLP's contribution to noise represents a cumulative effect in an area where baseline levels for sleep disturbance and speech comprehension are already exceeding existing guidance limits.

Residual cumulative effects during construction (of both the FTBB and jetty) have a high likelihood of occurring resulting from an increase in construction noise from industrial infrastructure. The EAO concludes that significant cumulative effects to the Noise VC are not expected as a result of the effects of TMJ interacting with the effects of other past, present and reasonably foreseeable future projects and activities.

The EAO is proposing Condition 15: Public Information to apprise the public of TMJ activities and to provide a means to solicit and receive feedback. The EAO concludes that with this and noise management measures in Condition 10: Construction Environmental Management Plan, Condition 11: Operations Environmental Management Plan and the recommended KMM under CEAA 2012 for a Noise Management Plan, there would not be any significant residual cumulative effects from the interaction of TMJ (for either the Application scenario or BVS) with other reasonably foreseeable projects.

6.2.6 CONCLUSIONS

Considering the above analysis and having regard to the mitigation measures identified in the provincial TOC, including Condition 10: Construction Environmental Management Plan, Condition 11: and Operations Environmental Management Plan, Condition 15: Public Information (which would become legally binding as conditions of the provincial EAC) and KMMs under CEAA 2012 for a Noise Management Plan (Appendix 1), the EAO is satisfied that TMJ would not have significant adverse residual or cumulative effects on the Noise VC.

7.0 ASSESSMENT OF HERITAGE EFFECTS

7.1 HERITAGE RESOURCES

This chapter assesses potential TMJ effects to subcomponents of Heritage Resources (Chapter 7 of the Application) and Physical Heritage and Effects on Historical, Archeological, Paleontological or Architectural Sites or Structures (CEAA 2012 requirements in Sections 11.2.3.2 and 11.2.3.4 of the Application). Potential effects to Cultural Heritage (a component of

CEAA 2012 5(1)(c)(ii)), including access to cultural heritage, are assessed in Current Use (Section 11.4 of this Report).

7.1.1 BACKGROUND

Heritage Resources were selected as a VC due to their importance to Indigenous Groups, the public, and other stakeholders, regulatory requirements, and conservation/ scientific importance and given their sensitivity to physical disturbance. TMJ is located in an area with a long history of human habitation and high archeological potential.

The Application assessed the effects of TMJ on historical resources, the physical remains of human activity post-dating 1846, and physical heritage including: burial sites; culturally significant landscapes; and features such as village sites or historic travel-ways including trails and canoe landing sites (linkage to CEAA 2012 Sections 5(1)(c)(iv) and 5(1)(c)(ii).

The Application modelled the potential for Heritage Resources based on a range of sources including: Aboriginal Traditional Knowledge; paleontological databases and scientific reports; ethnographic and historical sources including maps, reports, photographs and aerial photographs; heritage inventories, libraries and registrars; and known archaeological sites.

The effects assessment on Heritage Resources is linked to the River Processes PC (Section 5.3), Current Use (Section 11.4) and Accidents and Malfunctions (Section 9) sections of this Report.

MARINE SHIPPING ASSESSMENT

The MSA presented the potential effects of marine shipping on archaeological and historical resources. Archaeological and historical resources along the shores of the marine shipping corridor. Indigenous Groups raised concerns about potential wake effects of marine shipping on archaeological sites within the MSA area, such as middens, particularly those featuring burials of human remains.

TJLP based the characterization of baseline conditions on the desktop reviews of existing and publicly available EA and regulatory filings consideration of TEK, where available, and modelling. The key information source for Heritage Resources was the RBT2 Marine Shipping Supplemental Report[105].

The effects assessment for the Heritage Resources MSA is related to the Vessel Wake (Section 5.4), Current Use (Section 11.4) and Accidents and Malfunctions (Section 9) sections of this Report.

[105] Port of Vancouver. 2015. Roberts Bank Terminal 2: Marine Shipping Supplemental Report (Addendum to the Environmental Impact Statement). Available at: https://iaac-aeic.gc.ca/050/evaluations/document/103783.

7.1.1.1 REGULATORY CONTEXT

Heritage sites, including archaeological, historical and paleontological sites, are protected under the HCA and are provincially regulated by the Archaeology and Heritage Branches of FLNRORD. Historic sites may also be protected by the *Local Government Act* regulated by local governments and included in the Community Heritage Register.

CEAA 2012 (Sections 5(1)(c)(ii) and 5(1)(c)(iv)) requires the assessment of effects related to changes to the environment on "physical and cultural heritage" and "any structure, site or thing that is of historical, archaeological, paleontological or architectural significance".

Musqueam Indian Band, Squamish Nation, Stó:lō Research and Resource Management Centre, and Tsleil-Waututh Nation, whose established or asserted territories overlap TMJ, have heritage and permitting policies in place, and have issued permits to Golder Associates Ltd. for archaeological assessments within their asserted Traditional Territories.

7.1.1.2 BOUNDARIES

SPATIAL BOUNDARIES

The LAA for heritage resources encompasses the TMJ site, including onshore and offshore components and a 100 m buffer around the TMJ site. The RAA for heritage resources consists of the LAA and the South Arm of the Fraser River from the TMJ site downstream to Sand Heads, upstream to Annacis Island, and extending one km inland from the north and south shores of the Fraser River. The Cumulative Effects Assessment Area is the same as the RAA.

TECHNICAL BOUNDARIES

The presence of deep, historical fill at the dike and nearshore portions of the TMJ area precludes assessment of those areas for archaeological and historical remains using conventional methods. Areas inland of the dike are likely to have shallower fill deposits and may be assessed prior to, or concurrent with, proposed future ground disturbance activities (e.g., ground stabilization under the pipe rack).

MARINE SHIPPING ASSESSMENT

The MLAA for Heritage Resources in the MSA area is based on the three zones of wake affected shorelines as defined in RBT2 Marine Shipping Supplemental Report and in the Vessel Wake Effects Assessment (Section 3.1 of the MSA):

- Zone 1: Eastern ends of Tumbo and Saturna Islands;
- Zone 2: Western end of Stuart Island; and
- Zone 3: Vancouver Island in the vicinity of Victoria/ Discovery, Chatham, Chain and Trial Islands.

Secondary areas of focus including the southern ends of North Pender and South Pender Island, the southeastern part of Sidney Island, and Discovery and Chatham Islands, were considered as representative areas for Accidents and Malfunctions and are assessed in the Accidents and Malfunctions chapter (Section 9) of this Report.

The MSA RAA includes the MSA navigation channel and the shorelines in Segments A, B, C and D of the marine shipping area (see Figure 11 and 12 below).

7.1.2 POTENTIAL PROJECT EFFECTS AND PROPOSED MITIGATIONS IN THE APPLICATION

7.1.2.1 BASELINE INFORMATION

BASELINE INFORMATION AND EXISTING CONDITIONS

TJLP conducted a heritage resources overview assessment to determine the Heritage Resource potential for, and assess potential effects on, known and potential Heritage Resources within the RAA and LAA. Traditional use information provided by Indigenous Groups was also considered.

The Application notes there is potential for currently unidentified Heritage Resources, including previously unknown and unrecorded sites to be encountered in the LAA. Areas that have Heritage Resource potential include terrestrial portions of the LAA that would be subject to land-based ground stabilization and pile works during construction, and which may be subject to accidents and malfunctions (such as, spills) during operations.

Historical Resources

The Application considered historical resources and sites of architectural significance listed in heritage registrars, and archaeological sites and heritage wrecks protected under the HCA. In the RAA, 76 historical heritage properties and landscapes were identified during the desktop study (Figure 12). None of the sites are specifically identified as Indigenous historical sites but, one example of a site used by Indigenous people is the First People's House, a communal dwelling built in 1919 for the Phoenix Cannery in Steveston, is represented (DgRt-6). Five historical heritage properties are located within 5 km downstream of the TMJ site, but none were located in the LAA. In addition, there were five sites (including heritage wreck sites and archaeological sites with historical components) among the archaeological sites (protected under the HCA) reviewed within 5 km of the LAA (DgRr-023, DgRs113, DgRs-114, DgRr-025 and DgRr-041) (Figure 13). No heritage wrecks or archaeological sites with historical components were located in the LAA.

Physical Heritage (CEAA 2012 5(1)(c)(iv))

The sedimentary nature of the bedrock within the LAA and RAA provides potential for fossils to occur in this area. However, given the depth of bedrock (that is, 200 – 1,000 m) below existing sediments, it is unlikely that paleontological resources, if they exist, would be encountered during TMJ related activities.

Previously recorded pre-contact archaeological sites located in the RAA within five km of the TMJ site include (Figure 13): DgRr-023, a pre-contact fish weir, surface lithics (including ground slate knife); DgRr-039, pre-contact surface lithics and shell midden; DgRs-017, pre-contact surface fire broken rock, subsurface lithics, fishing weir; and DgRs-039, pre-contact fishing weir and surface lithics.

DgRs-017, located on the river bank directly opposite to TMJ, was identified by the Cowichan Nation Alliance, Kwantlen First Nation, Musqueam Indian Band, Tsawwassen First Nation and Tsleil-Waututh Nation as an important resource gathering (plant harvesting and fishing), habitation site, boat landing place, and also a place of spiritual and cultural value. The recorded site is 2 km in length, consisting primarily of wooden stakes in the intertidal area, some of which have been dated to the pre-contact period and are considered to represent fish weirs, and understood to be a historic Indigenous village site (former Indigenous village site). The former Indigenous village site has been reported as the largest pre-contact settlement on the South Arm of the Fraser River.

The Application reported that according to the Provincial Heritage Register, most of the site has either been destroyed by development or erosion, or is covered by 2 to 3 m of fill and is possibly set back from the existing riverbank. There is potential for Physical Heritage resources to exist anywhere along the banks of the Fraser River or sloughs. Based on analysis of known archaeological sites within the Metro Vancouver region, 90 percent of the known midden sites occur within 100 m of the shoreline.

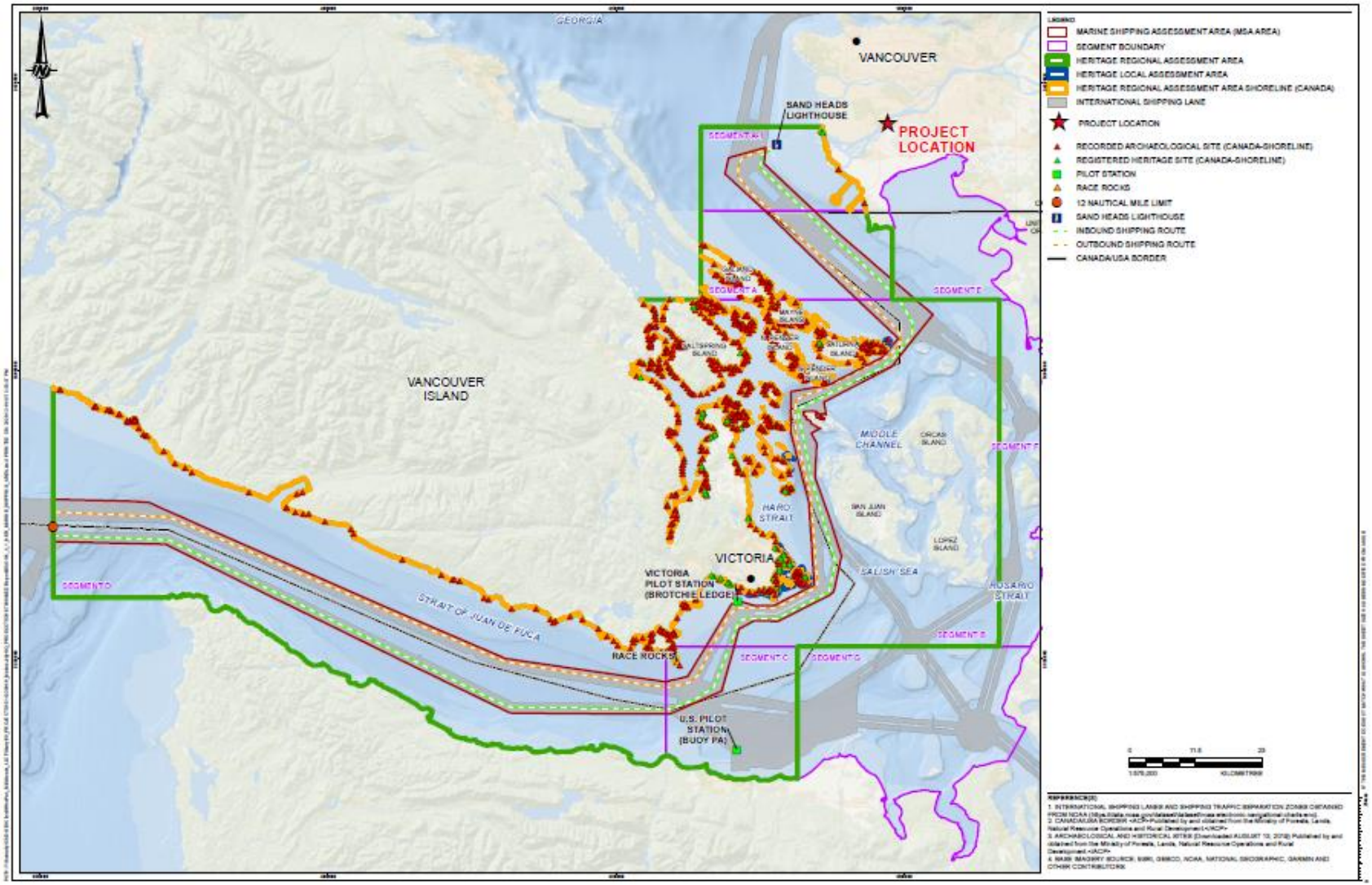

Figure 11: Marine Shipping Assessment Spatial Boundaries for Heritage Resources.

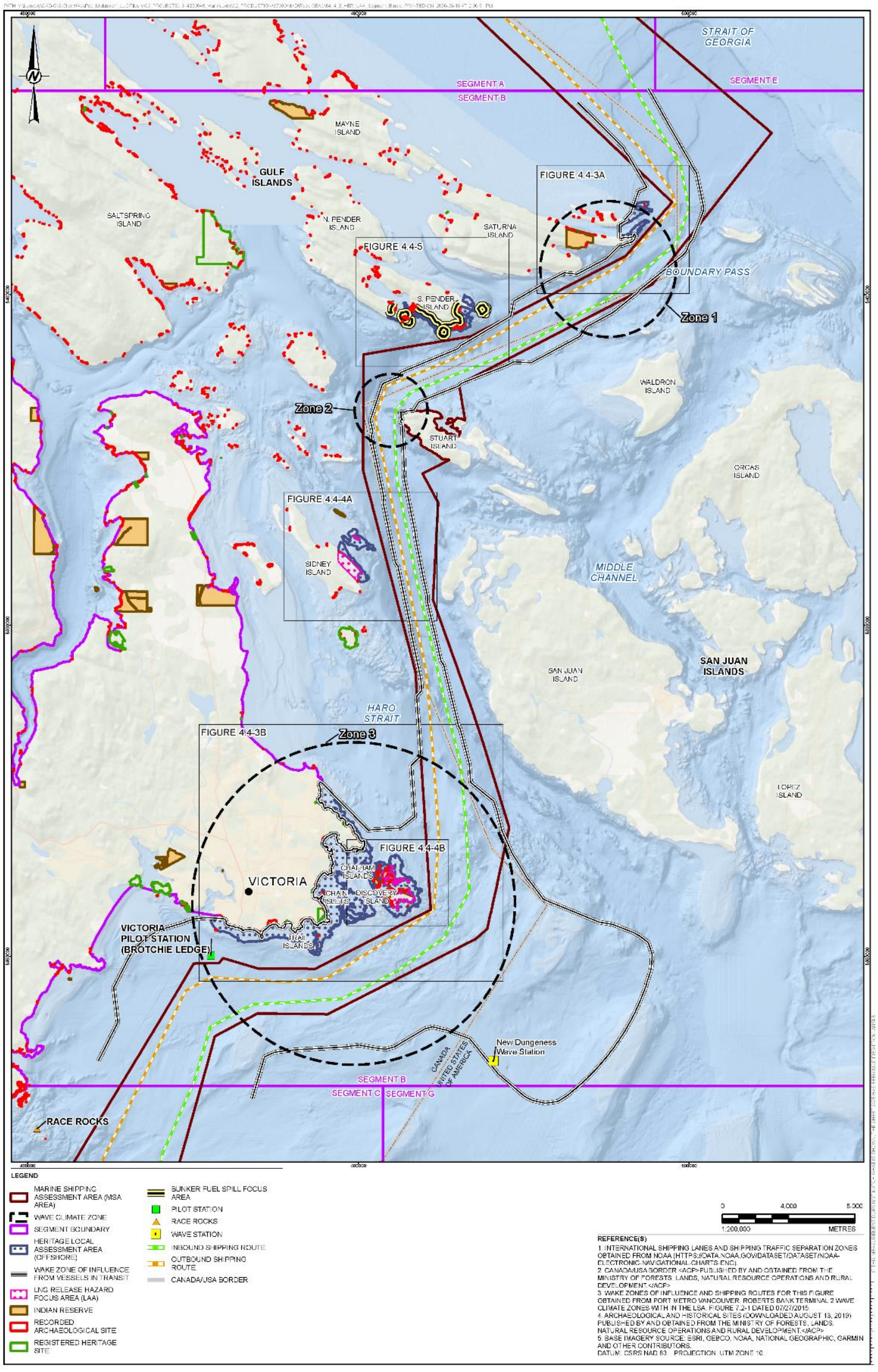

Figure 12: Marine Shipping Assessment LAA Spatial Boundaries in Segment B for Heritage Resources.

MARINE SHIPPING ASSESSMENT

TJLP reviewed existing information including the RBT2 Marine Shipping Supplemental Report, recent traditional use and TEK studies provided by Indigenous Groups, and publicly available data to conduct the MSA for Heritage Resources.

Wave Effects

TJLP identified a number of known archaeological and historical resources in the MSA LAA that may be affected by wave effects (see Figure 12 and 13) including those with shell middens, surface lithics, culturally modified trees, burials, canoe skids, cairns and other cultural depressions and sites. The Application reports that many of these sites have been affected by significant erosion. Numerous known historical sites and heritage wreck sites are also located in the MSA LAA along the waterfront, and in less than 20 m of water, off southern Vancouver Island.

Accidents and Malfunctions

The effects for Heritage Resources in the event of an LNG or bunker fuel oil release are assessed in the Accidents and Malfunctions chapter (Section 9) of this Report.

Potential for Archaeological and Historical Resources

The Application identified that while hundreds of sites have been recorded in the MSA RAA and are identified in the Provincial Heritage Registrar, there is potential for archaeological and historical sites to exist along the shoreline areas that are not bedrock. Indigenous Groups have identified unrecorded sites. Songhees Nation has expressed concern about adverse effects to cultural and spiritual sites at *Tl'ches* on Chatham and Discovery Islands, including archaeological deposits in intertidal zones.

7.1.2.2 POTENTIAL PROJECT EFFECTS

TJLP predicted archaeological or historical site alteration and changes to the level of accessibility as potential effects of TMJ-related activities on Heritage Resources.

Archaeological or Historical Site Alteration

In the Application, TJLP reported that ground-altering activities associated with construction or decommissioning that disturb, excavate or remove sediment or soil have the potential to damage or change the integrity of archaeological and historical sites. TMJ activities could result in potential encounters with deeply buried archaeological remains in the near river shore. However, TJLP noted that this is unlikely given the depths (likely up to 7 m) of recent deposits. Encountering archaeological remains in the dredge area is considered unlikely, given the location in an active, regularly dredged river channel, seasonal cycles of sediment erosion and

deposition due to river current, and depth of recent deposits in areas not previously dredged. Discovery of new sites could occur during TMJ activities, most likely during construction.

The Application stated that potential effects to physical heritage resources encountered by chance during TMJ activities in the LAA is expected to be avoided or reduced through realignment or redesign of TMJ components, therefore residual effects are not expected.

Changes in the Level of Accessibility

The Application identified that TMJ construction and decommissioning activities may change the level of accessibility to historical sites, features, and objects, if present, in the following ways:

- Historical and archaeological sites, features and objects might be buried by fill or placed behind a security fence effectively precluding scientific investigations for the foreseeable future;
- Intentional burial or fencing can be a positive effect, particularly in locations prone to unauthorized artifact gathering;
- Historical sites, features and objects may be exposed in publicly accessible areas such as the riverbank, thereby increasing the likelihood of illicit collecting by members of the public; and
- During decommissioning, historical sites, features and objects, if present, may no longer be protected by a security fence, thereby increasing the likelihood of illicit collecting by members of the public.

TJLP concluded that the likelihood of adverse residual effects is considered low, given the assessed potential for the presence of historical resources in the LAA and the effectiveness of the mitigation methods proposed in the Application. Presence/ absence of heritage wrecks may be further determined with review of remote sensing data, if available, and depending on the data and results of further assessment, archaeological monitoring of construction activities may be recommended.

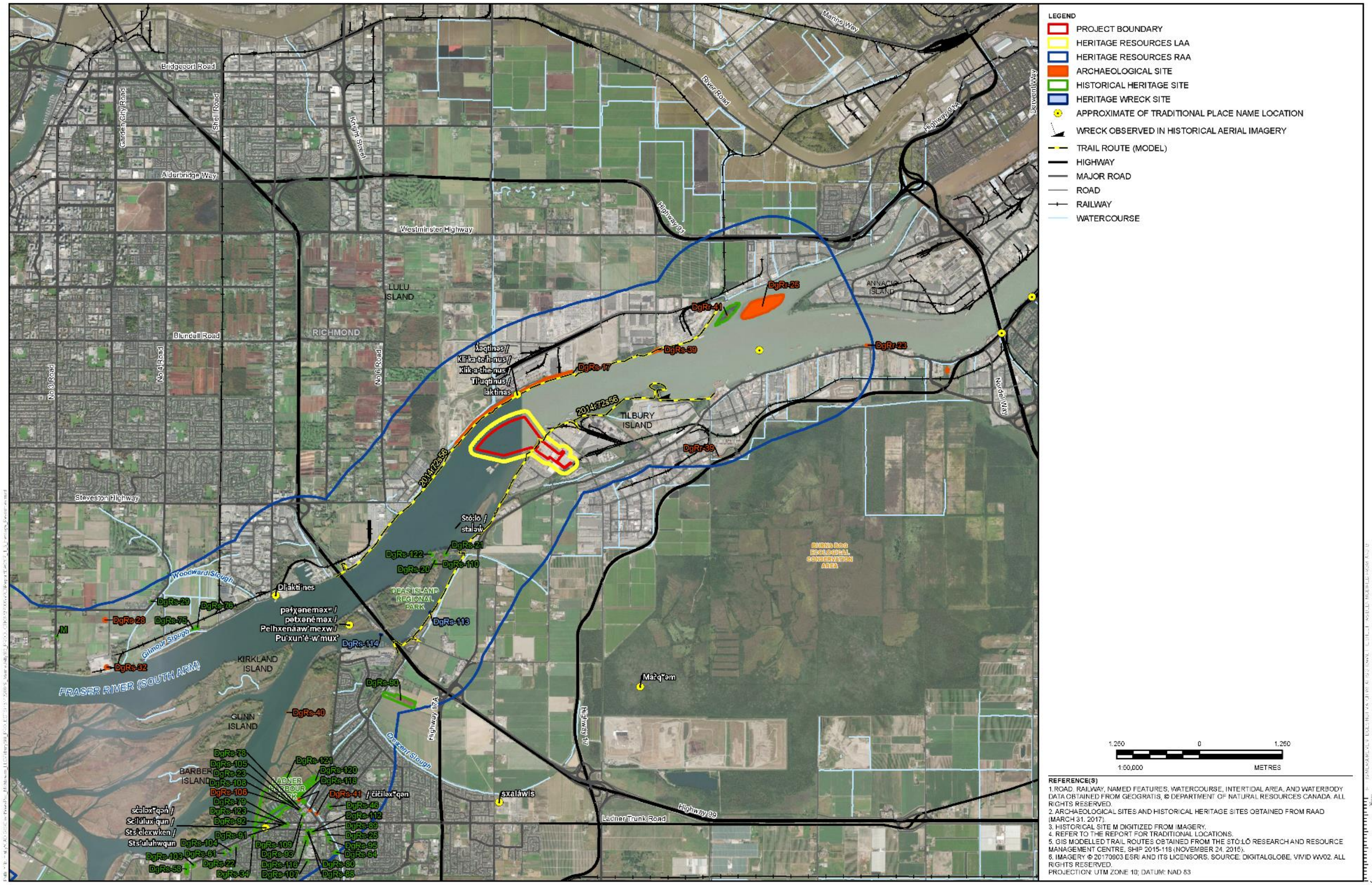

Figure 13: Archaeological and Historical Resources in the original Application area (jetty to Sand Heads).

Potential Wake Effects in RAA

The Application examined potential adverse effects of vessel wake and propeller wash on Historical Resources (in recorded sites on the river bank in the RAA and adjacent to the South Arm Navigation channel), including during marine transportation of materials, carrier berthing and departure, and marine shipping from the TMJ site to Sand Heads. TJLP's wake study (Appendix 4.1-2 of the Application) reported that the TMJ LNG carrier wake heights are anticipated to be lower than existing vessels, and TMJ LNG barge wake heights are anticipated to be similar to other vessels presently using the river. TJLP predicted that wave effects would be negligible given the minimal contribution of TMJ's vessel traffic to existing wake in the RAA (see Section 5.3, River Processes).

BUNKER VESSEL SCENARIO

In the Application, for berthing and departure of vessels, it was determined that effects of vessel wakes and propeller wash on archaeological site DgRs-17 (located directly opposite to the jetty) would be negligible, given the limited change to wake and propeller wash effects from existing river traffic predicted due to TMJ-related vessel traffic. For shipping from the TMJ site to Sand Heads, it was determined that effects of vessel wake on archaeological remains and to recorded sites along the riverbank within the RAA and adjacent to the South Arm navigation channel would be negligible, given the limited change to existing wake effects anticipated due to TMJ-related vessel traffic.

In the BVSA, TJLP concluded that no changes in the conclusions of the River Processes assessment are predicted compared to what was presented in the Application; therefore, no change in effects to heritage resources are anticipated. TJLP did not identify an interaction for paleontological resources and historical resources from vessel berthing and departure, and shipping from the TMJ site to Sand Heads, and effects remain negligible to archaeological resources. TJLP concluded that the increase in annual bunker vessels is predicted to result in a negligible effect on Heritage Resources, and the effects assessment in the Application is expected to remain unchanged.

MARINE SHIPPING ASSESSMENT

The MSA identified increase in breakage and weakening of artifacts in intertidal sites and loss of site integrity from increased shore erosion as potential effects of vessel wake on archaeological and historical resources.

The MSA predicted that the magnitude of nearshore wave energy caused by vessel wake would be negligible in the MSA area, and, as such, vessel wake associated with TMJ-related shipping is not predicted to increase coastline erosion or resuspension of sediments beyond natural

processes. TJLP concluded in the MSA that vessel wake interaction with Heritage Resources would be negligible.

7.1.2.3 MITIGATION MEASURES PROPOSED IN THE APPLICATION

The Application proposed numerous measures to mitigate effects to Heritage Resources including the following mitigation hierarchy:

- Conducting field investigations (that is, an Archaeological Impact Assessment [AIA]) in areas with archaeological or historical potential prior to, or concurrent with construction activities, to identify unknown historical or archaeological sites;
- Realigning or redesigning TMJ components to avoid Heritage Resources should any be found during subsequent studies or during construction;
- If avoidance is not feasible, implementing alternative protection methods including protective coverings, stabilization and physical barriers aimed to reduce effects on Heritage Resources;
- If affects cannot be avoided or minimized, effects would be reduced through a variety of measures, including surface artifact collection, additional inventory studies or systematic data recovery (for example, excavation, detailed recording and documentation, construction surveillance or monitoring) to achieve no net loss. TJLP has committed to consulting with Indigenous Groups on proposed measures to avoid or reduce effects; and
- A Heritage Resources Chance Find Management Procedure would be implemented to ensure preservation and proper management of Heritage Resources that are unexpectedly encountered during TMJ activities. The document would include guidelines to follow in the event of a discovery of known or suspected heritage materials during TMJ activities.

TJLP has committed to working with Indigenous Groups during field investigations and consulting with Indigenous Groups on the Heritage Resources Chance Find Management Procedure and a communications plan for construction, operations and decommissioning activities that may affect access and use opportunities for Indigenous Groups related to harvesting or cultural activities.

No additional mitigation measures were proposed by TJLP as part of the BVSA.

MARINE SHIPPING ASSESSMENT

TJLP stated that no mitigation measures are recommended for vessel wake from Marine Shipping associated with TMJ as the potential wake-related effects on archaeological and historical resources and physical heritage are predicted to be negligible.

7.1.3 POTENTIAL PROJECT EFFECTS AND PROPOSED MITIGATIONS IDENTIFIED DURING APPLICATION REVIEW

The following key issues related to the assessment of Heritage Resources for TMJ were identified during Application review and based on feedback from the Working Group:

- Erosion from propeller and wake wash/ river processes;
- Archaeological assessment;
- Erosion from vessel wake in the MSA; and
- Accidents and Malfunctions.

EROSION FROM PROPELLER AND WAKE WASH/ RIVER PROCESSES

Tsleil-Waututh Nation and Musqueam Indian Band expressed concern about the potential effects of wave erosion caused by vessel wake on archaeological sites within the RAA (in particular the former Indigenous village site) due to increased marine traffic. Tsleil-Waututh Nation expressed particular concern about effects to a possible fish weir that was recently discovered in the riparian zone associated with the former Indigenous village site and Tsleil-Waututh Nation requested that TJLP develop a management plan to specifically mitigate effects. During the review of TJLP's BVSA Report, Tsleil-Waututh Nation raised concerns related to increased vessel frequency and scour that could potentially result in higher potential effects to archeology and heritage resources, including the culturally important fish weir located upstream from the marine terminal area for TMJ.

> TJLP responded that the wake and propeller wash study completed for the Application concluded that there would be a negligible increase in marine traffic which would result in a negligible increase in wake effects on the riverbank. For the BVS, TJLP maintains that wake associated with TMJ-related vessels would be less than the wake of other vessels operating in the Fraser River shipping lanes, and that the increased frequency of bunker vessels would not change the magnitude of the effect (e.g., higher wake waves are not expected for the BVS). TJLP also clarified that upstream archeological and heritage resources (e.g., DgRs-39), were not included because the majority of bunkering vessel traffic is anticipated travel downstream of the jetty, therefore interaction between TMJ-related vessels and archeological and heritage resources is not expected.
>
> TJLP responded that the fish weir site location would be identified as a sensitive area in the spill response plan and the intertidal area would be monitored for erosion through geophysical survey. TJLP also committed to conducting bathymetric surveys of the riverbed to collect data through construction and into operations which may help determine whether sites are being affected by erosion due to increased traffic.

The EAO is in agreement with TJLP, that the increased frequency of vessels would not change the magnitude of the effect (e.g., higher wake waves are not expected in the BVS) and as such the interaction remains negligible under either the Application scenario or BVS considered for TMJ. The EAO is proposing Condition 13: River Bed Monitoring Plan, which would require TJLP to conduct bathymetry surveys of the entire channel width every five years during operations, and monitoring of scour, erosion, and river-bed morphology, and describe how Indigenous Groups would be informed of the results of monitoring studies.

ARCHAEOLOGICAL ASSESSMENT

Musqueam Indian Band disagreed with the Application's conclusions that heritage and archaeology resources would unlikely occur within the marine environment, particularly in the river bed below and beside the former Indigenous village site where heritage resources might have been deposited as a result of erosion.

> TJLP stated that the heritage resources overview assessment determined that there is low archaeological potential in the river and in the dredge footprint due to seasonal cycles of deep erosion and deposition on the river bed and the strength of prevailing river currents which carry sediments and any potential eroded archeological material downstream more than downslope from the source. In the intertidal area up to and including the dike, the depths of recent deposits measured in geological core samples make testing for any potential older archaeological deposits impractical. As such, no marine field testing is planned.

Tsleil-Waututh Nation and Musqueam Indian Band requested that TJLP conduct further archaeological assessment including a pedestrian survey and testing of areas that have the potential to be affected by erosion prior to finalizing design and construction plans. Tsleil-Waututh Nation and Musqueam Indian Band also requested to be consulted with on and participate in any archaeological assessment and on the development of the Heritage Resources Chance Find Management Procedure, including if any change in accessibility is proposed.

> TJLP committed to archaeological testing and conducting an AIA in the terrestrial portion of the LAA prior to construction, with participation from Indigenous Groups.

The EAO notes that Heritage Resources are protected under the HCA, whether they are known or unknown, and may not be altered or changed in any manner without a permit. In addition, permits would also be required from some Indigenous Groups to conduct an AIA. TJLP would require an HCA Section 12.2 permit prior to conducting site investigations and, should Heritage Resources be found, a Section 12.4 permit would be required to authorize the removal of residual archaeological deposits. The Section 12.4 permit includes a condition which stipulates that in the event ancestral remains are encountered, all work must cease in the vicinity of the

remains. Mitigation measures would be determined in consultation with Indigenous Groups, the Archaeology and Heritage Branches of FLNRORD and the B.C. Oil and Gas Commission.

The EAO has proposed Condition 14: Cultural and Archaeological Resources Management Plan which would require TJLP to develop a plan in consultation with Indigenous Groups to mitigate effects of TMJ to archaeological resources and cultural sites in the marine terminal area. The EAO is also recommending KMMs under CEAA 2012 for cultural and archeological resources. Both the proposed provincial condition and the recommended KMMs include the following:

- Conducting an AIA prior to construction and consulting Indigenous Groups on the means by which they can be involved in the assessment;
- Developing a Chance Find Management Procedure in consultation with Indigenous Groups which would include the procedures by which TJLP addresses any discovered archaeological resources and human remains; and
- Developing a procedure to prevent unauthorized access, and to address access preferences of Indigenous Groups to archaeological and cultural sites during the completion of the AIA and during construction.

EROSION FROM VESSEL WAKE IN THE MSA

Tsleil-Waututh Nation expressed concern that the MSA did not account for the cumulative effects of increased vessel traffic on heritage resources and that the study does not consider potential effects of wake energy on unknown sites in an area of high archaeological potential. Tsleil-Waututh Nation requested that a new site inventory be conducted along the shipping lane.

> TJLP responded that since no residual effects for Heritage Resources from wake waves are predicted, no cumulative effects have been determined. TJLP acknowledged that no comprehensive archaeological inventory was completed for the MSA area and provided that the effort in undertaking a complete inventory of potentially vulnerable Heritage Resources would be disproportionate for TMJ given their determination of no residual effects from wake waves.

Malahat Nation expressed concern with TJLP's estimation that the waves from the shipping lane would be indiscernible from the natural wave environment. Malahat Nation commented that this might be true at large distances but in cases where vessels pass close to shore (e.g., Areas in zones 1, 2 and 3, around the southern gulf islands and Victoria), vessel wake could be over the natural wave environment statistic. Malahat Nation asked whether TJLP could enforce a mandatory vessel slowdown in these areas to mitigate effects on heritage resources.

> TJLP has committed to TMJ-related vessels participating in the VFPA-led ECHO Program seasonal slowdown initiatives, which includes a seasonal slowdown in the waters of

Haro Strait and Boundary Pass. Additionally, the EAO accepts TJLP's modelling for areas where vessel wake will be closer to shorelines, such as the areas identified by Malahat Nation, and the EAO does not expect waves in these areas to be outside the natural range of variation.

ACCIDENTS AND MALFUNCTIONS

Tsleil-Waututh Nation commented that they disagree with the conclusions of the MSA which states that effects to archaeological sites as a result of a fire or spill are low magnitude of disturbance, short duration and partially reversible. Disturbance to archaeological sites, in Tsleil-Waututh Nation's view, especially to burials/ cairns, would be significant and permanent effects.

TJLP responded that the MSA rated the risk of an LNG or bunker fuel release as having a consequence severity that ranges from moderate to very high. The very high consequence rating accounts for the potentially irreversible effects. However, the likelihood for LNG or bunker fuel release leading to irreversible damage is extremely rare since irreversible damage would happen only if the fuel release occurred within the vicinity of susceptible heritage resources.

The EAO acknowledges that a release of LNG or bunker fuel in the vicinity of heritage resources could potentially have significant and irreversible effects. However, the EAO understands that such an occurrence is rated as being rare. The EAO proposes Condition 9: Construction Environmental Management Plan and Condition 10: Operations Environmental Management Plan, which would require TJLP to develop an emergency response plan and spill prevention plan in consultation with Indigenous Groups which would include communication procedures should an accident or malfunction occur in the TMJ area. The EAO also recommends KMMs under CEAA 2012 for an Emergency Response Plan and Marine Shipping Emergency Response Outreach Program in the MSA.

7.1.4 THE EAO'S ANALYSIS AND CONCLUSIONS

This section presents the EAO's conclusions on the potential adverse residual effects from TMJ on historical resources and physical heritage.

The EAO evaluated the potential effects to the above by considering construction, operations and decommissioning activities that could affect Heritage Resources through historical or archaeological site disturbance due to ground altering activities or vessel wake effects.

Proposed Provincial Conditions and Key Mitigation Measures (CEAA 2012)

Based on mitigations proposed in the Application and issues raised during Application review, the EAO proposes the following provincial conditions and recommends KMMs under CEAA 2012:

- Condition 14: Cultural and Archaeological Resources Management Plan (provincial condition) and heritage KMMs, that include the requirement for TJLP to conduct an AIA, identification of the measures TJLP would use to prevent any unauthorized access to archaeological and cultural sites, and how TJLP would manage any archaeological resources and ancestral remains should any be found during TMJ activities.

Residual effects: After considering the proposed mitigation measures, the EAO concluded the following with respect to residual effects on Heritage Resources for both the Application scenario and BVS:

- Historical resources: no residual effects; and
- Physical heritage: no residual effects.

TJLP have undertaken archaeological studies that did not identify evidence of archaeological resources, resulting in reduced potential for the TMJ site. The EAO is satisfied that further archaeological studies undertaken prior to construction would reduce the uncertainty of unexpectedly encountering historical or physical heritage resources in the LAA and combined with the proposed mitigation measures would reduce the probability of adverse effects. Heritage Resources are protected under the HCA and mitigations for potentially affected sites would be determined in consultation with FOR's Archaeology and Heritage Branch. A Chance Find Management Procedure, developed in consultation with Indigenous Groups, would outline the process for ensuring the preservation and proper management of Heritage Resources should any be unexpectedly encountered during TMJ activities. Therefore, the EAO does not predict residual effects to Heritage Resources due to ground altering activities in the LAA.

The EAO concludes that given predicted increase in marine traffic[106] over current conditions, and that the majority of TMJ-related vessels being bunker vessels in the BVS, TMJ would have no residual effects on Heritage Resources from erosion due to wake effects/ propeller wash along the shorelines of the Fraser River in the RAA.

[106] TJLP predicted the increase in vessel traffic due to TMJ, based on 2018 baseline levels estimated near the TMJ site at Gravesend Reach. For the Application scenario of 137 vessel calls annually, TJLP predicted a 4.1% increase in large vessels and 1.2% increase for bunker vessel-size ships (comparable to size of a tug). For the BVS of 365 vessel calls annually, TJLP predicted a 3.5% increase in large vessels and 5.2% increase for bunker vessel-sized ships.

The EAO does not predict residual effects on Heritage Resources presented in the MSA due to wave erosion as the magnitude of the vessel wake is predicted to be within the range of natural variation for wave activity in the MSA area.

7.1.5 CONCLUSIONS

Considering the above analysis and proposed mitigation measures identified in the provincial TOC, including Condition 14: Cultural and Archaeological Resources Management Plan (which would become legally binding as a condition of an EAC) , and recommended KMMs under CEAA 2012 for heritage resources (Appendix 1), the EAO is satisfied that TMJ would not have residual effects on Heritage Resources, including components related to Sections 5 (1)(c)(ii) and 5(1)(c)(iv).

8.0 ASSESSMENT OF SOCIAL AND ECONOMIC EFFECTS

8.1 SOCIO-COMMUNITY

8.1.1 BACKGROUND

The Socio-Community VC was selected to assess potential TMJ effects on health and emergency services, community infrastructure, and community health and well-being. Socio-Community was included as a VC due to TMJ's use of municipal water and solid waste infrastructure, as well as the potential for use of health and emergency services.

The Application selected the following subcomponents of Socio-Community to evaluate potential effects:

- *Change in demand for health and emergency services* (Health and Emergency Services) from an increased demand for fire, police, ambulance, marine rescue, and other healthcare services because of TMJ activities;
- *Change in demand for community infrastructure* (Community Infrastructure) from increased demand for water, solid waste disposal, and transportation infrastructure as a result of TMJ activities; and
- *Change in community health and well-being* (Health and Well-being) from TMJ-induced nuisance from noise, nighttime light, changes to air quality, and other social determinants of health, that may affect community health and well-being.

The Socio-Community VC is linked to the following VCs:

- Noise VC as a change in noise could increase nuisance, and in turn affect community health and well-being;
- Economy VC as changes to social determinants of health due to TMJ could influence the community health and well-being, particularly for Indigenous Groups. Additionally, the results of the Socio-Community assessment informed parts of the Economy VC as change in demand for community infrastructure could affect local government finances;
- Land and Marine Use VC as demand on local marine emergency services due to TMJ direct use of services could affect marine emergency service demand and supply;
- Human Health VC as changes to air and water quality due to TMJ could influence community health and well-being, including to Indigenous Groups;
- Current Use of Lands and Resources for Traditional Purposes VC as changes in access to marine areas used for traditional purposes due to TMJ marine use could influence community health and well-being for Indigenous Groups; and
- Visual Quality VC as visibility changes in daytime viewing and nighttime lighting could increase during TMJ Operation, which could affect community health and well-being.

Physical determinants of health associated with air quality are assessed in Air Quality (Section 5.1) and Human Health (Section 6.1) chapters of this Report.

Effects on the Health and Socio-Economic Conditions of Indigenous Peoples Related to the CEAA 2012 subparagraph 5(1)(c)(i) (Section 9) are also linked to the Socio-Community VC as changes to demand in health and emergency services are connected to the health and socio-economic conditions of Indigenous Groups. Effects under 5(2)(b)(i) of CEAA 2012 are also linked to the assessment of Socio-Community.

TJLP did not assess the Socio-Community VC as part of the MSA. Relevant marine-based subcomponents are captured under the Marine Resource Use VC (Section 8.2). Indigenous community health and wellbeing is addressed in Current Use of Lands and Resources for Traditional Purposes (Section 11.4).

8.1.1.1 REGULATORY CONTEXT

Healthcare is publicly funded and provided by the provincial government in the Lower Mainland through the Fraser Health and Vancouver Coastal Health Authorities. Indigenous healthcare is funded and administered by the Government of Canada through the *Canada Health Act*. Police services are governed by the *Police Act* and provided in the TMJ site boundary by the Delta Police Force; ambulatory services are governed by the *Emergency Health Services Act* and provided by the British Columbia Ambulance Service; and fire services are the responsibility of local government authorities as directed under the *Fire Services Act*. The CCG is responsible for the management of vessel traffic for marine risk reduction, including marine rescue services, under the federal *Oceans Act*. See Section 9 (Accidents and Malfunctions) for more details on incident response.

The *Local Government Act* provides the framework for regional districts regarding planning and land use. The *Community Charter* provides municipalities jurisdiction over water, wastewater, solid waste management systems and other utilities.

There are no provincial regulatory requirements that directly guide community health and well-being; however, the B.C. Ministry of Health has several programs which support health promotion, health protection, disease and injury prevention, health assessment, and disease surveillance. Key federal and provincial legislation, policy, and regulatory guidelines apply to the Socio-Community VC. CEAA 2012 Sections 5(1)(c)(i) and 5(2)(b)(i) requires the assessment of effects related to changes to the environmental relevant to the human health assessment as changes to air and water quality are linked to the health and socio-economic conditions of Indigenous peoples and the public.

8.1.1.2 BOUNDARIES

Spatial boundaries for the LAA for the Health and Emergency Services and Community Infrastructure and the Social Determinants of Health aspects of community Health and Well-being include Metro Vancouver, with a focus on Delta; the RAA includes Metro Vancouver. The LAA for the Nuisance Noise and Light aspects of the Community Health and Well-being sub-component include the combined LAA for the Noise and Visual Quality VCs, while the RAA is the combined RAA for the Noise and Visual Quality RAAs.

8.1.2 POTENTIAL PROJECT EFFECTS AND PROPOSED MITIGATIONS IN THE APPLICATION

8.1.2.1 BASELINE INFORMATION

Baseline information on the Socio-Community subcomponents was developed through publicly available studies such as the Census, B.C. Stats reports, reports from B.C. Ministry of Health and Ministry of Transportation and Infrastructure (MOTI), Indigenous and municipal government reports, and included consideration of Traditional Use Studies (TUS) and TEK where available. The Application notes, however, that the TMJ-specific studies undertaken by Indigenous Groups and that are available through publicly available sources did not provide specific information on potential health and well-being effects.

HEALTH AND EMERGENCY SERVICES

Health services in Delta are provided by the Fraser Health Authority. Land based emergency services (Police, Fire, and Ambulance) from Delta are predicted to be the first responders to arrive at TMJ in the event of an incident that requires assistance from these services. In the event of a marine-based emergency, response is provided by the CCG, and vessels of opportunity such as the Canadian Lifeboat Institution, and the Royal Canadian Marine Search

and Rescue. The CCG operates from Sea Island, approximately 18.5 km from TMJ by boat, providing vessels (for example, life boat and hovercraft) and rescue divers as necessary; secondary rescue vessels are provided by the any other federal asset (i.e., RCMP, DFO or non-Search and Rescue tasked CCG ships). A marine-based emergency that involves a spill of LNG may require a coordinated effort between both the marine-based and the land-based emergency response organizations listed. Additional discussion regarding LNG spills can be found in Accidents and Malfunctions section (Section 9) of this Report.

COMMUNITY INFRASTRUCTURE

Water provisions and management responsibilities are shared between Metro Vancouver and its member municipalities. Solid waste is also managed by Metro Vancouver once residential, industrial, commercial, and institutional waste is collected by municipal collection crews.

River Road, the primary service road to TMJ, is part of the B.C. Major Road Network jointly managed by TransLink and local municipalities. Traffic on this road reflects a predominantly commuter-based profile with relatively stable traffic levels throughout the year (that is, little seasonal tourism-based travel).

HEALTH AND WELL-BEING

The Application notes noise and nighttime light levels collected at four receptor sites, representative of residences, that were in proximity to TMJ:

- Receptor 1 (R1) - Residences located 440 m south of the TMJ site boundary;
- Receptor 2 (R2) - Animal shelter located across from Tilbury Road from the TMJ site, approximately 150 m southeast of the TMJ site boundary;
- Receptor 3 (R3) - Site representing First Nations village of Tl'uqtinus, which is also a proposed future habitation site, located 300 m north of the TMJ site boundary; and
- Receptor 4 (R4) - Residences located approximately 1,300 m southwest of the TMJ site boundary and within 300 m of the proposed shipping route.

Baseline noise level measurements (day-night) and baseline nighttime light levels from the Application are presented below. The Application also noted that nighttime light measurements were not collected at R1 as the TMJ site is not visible from this location.

Table 27: Baseline Noise Measurements and Nighttime Light Measurements by Receptor location

Assessment Receptor (site)	Baseline Case Noise Level (day-night) (dBA)	Light Trespass		Sky Glow	
		Illuminance (lux)	Environmental Light Zone Classification[(a)]	Sky Glow (% above natural background)	Environmental Light Zone Classification
R1	63.0	n/a	n/a	n/a	n/a
R2	58.0	2.935	E4	70,372	E4
R3	57.9	0.419	E2	5,871	E4
R4	56.0	0.846	E2	5,148	E4

(a) Environmental Light Zone Classification based on the Commission Internationale de L'Eclairage (CIE) guidelines. E1: Natural, intrinsically dark; E2: Rural, low district brightness; E3: Suburban, medium district brightness; E4: Urban, high district brightness.

The Application describes baseline information regarding other social determinants of health in the LAA and RAA, including, community connectedness and social support networks, education and literacy, employment and working conditions, personal health practices and coping skills, and healthy child development.

8.1.2.2 POTENTIAL PROJECT EFFECTS

HEALTH AND EMERGENCY SERVICES

The Application predicted that that there could be an increased demand on local ambulances during construction. The Application also noted that in the event of a water-based emergency, which would be rare, marine-based rescue could result in increased demand for marine emergency services for all phases of TMJ.

COMMUNITY INFRASTRUCTURE

The Application notes that use of community infrastructure during all phases of TMJ would be minimal. Waste streams generated on site would be disposed of in accordance with applicable regulatory requirements and bottled potable water would be provided for workers. Effects to local public roads would be negligible as the construction materials would be transported by barge; while the workforce of seven full time equivalent employees is not anticipated to measurably increase local vehicle traffic during operations.

HEALTH AND WELL-BEING

Changes in the social determinants of health (community connectedness, social support networks, education and literacy, employment and working conditions, personal health practices, and healthy child development) are not anticipated to result during construction, operations or decommissioning. This is due in large part to TJLP sourcing most of its workforce locally during construction and continuing to utilize the existing local workforce for operations.

The Application noted that the estimated TMJ employment and income was considered a benefit to community health and well-being (see Economy, Section 8.4 of this Report).

Noise has the potential to exceed HC thresholds for change in %HA at a proposed future habitation site (that is, R3) during the construction of the temporary and permanent berth. Noise modelling results at R3 did not exceed thresholds for %HA during operations. Noise modelling results for all other receptors (two residences and an animal shelter) were below the HC threshold for change in %HA during both construction and operations. Noise levels during decommissioning are expected to be similar to those predicted for construction, and mitigation measures were proposed for predicted potential effects. Construction, operations and decommissioning associated lighting emission increase at night is not anticipated to change the overall baseline lighting conditions in the LAA.

The Application notes that community well-being may be affected with respect to Indigenous Groups and changes in their access to areas for FSC purposes. The Application points out that FSC fishers are limited to DFO fishing windows and, if they are in designated shipping lanes, must give way to oncoming vessels that are required to transit in these lanes. TJLP committed to avoiding transiting known fishing areas during DFO openings, where possible, and proposed a Marine Access and Transportation Plan and Marine Communications Plan that would outline specific procedures to maintain commercial and non-commercial navigation throughout all TMJ phases. TJLP noted that these plans would be further supplemented by a Marine and Indigenous Communications Plan.

The Application concluded that potential effects of changes in access for FSC and Domestic purposes would have a negligible effect on Indigenous people's health and well-being, following mitigation. Marine use and access is assessed further in the Land and Marine Resource Use (Section 8.2), Current Use (Section 11.4), and Part C chapters in this Report, addressing the issues relating to access in more detail.

BUNKER VESSEL SCENARIO

Health and emergency services could be affected if the increased frequency of vessels resulted in an increase in marine-related accidents, which in turn, could result in increased demand for marine emergency service providers. In the BVSA, TJLP concluded that the residual risk of allision, grounding, or collision resulting in LNG release and fire associated with the additional bunker vessel traffic is consistent with what was identified in the Application. Therefore, no change in demand for marine emergency service providers associated with the increased frequency of bunker vessels is anticipated by TJLP compared to the negligible finding identified in the Application.

Community health and wellbeing could be affected if changes in vessel frequency resulted in increases to noise and nighttime light, which could result in increased nuisance to nearby

residents. In the BVSA, TJLP concluded that the effects from the increase in annual bunker vessels on Noise (see Section 6.2.2) is not predicted to result in changes in effects from what was presented in the Application. Therefore, no change in nuisance to nearby residents and effect on community health and wellbeing is anticipated from the negligible interaction identified in Section 6.1 of the EAC Application.

TJLP assessed predicted effects to Visual Quality in the Application based on the larger LNG carrier vessels, which are more visually prominent than the much smaller LNG bunkers. In the BVSA, TJLP concluded that no additional effects to visual quality from increased frequency of bunker vessels are anticipated. Therefore, no change in nuisances from noise and nighttime light associated with the increased frequency of bunker vessels to nearby residents is anticipated by TJLP compared to the negligible finding identified in the Application.

Overall, TJLP's BVSA did not predict changes to the results of the visual quality or noise assessment; therefore, TJLP did not predict a change to the results of the Socio-community assessment.

8.1.2.3 MITIGATION MEASURES PROPOSED IN THE APPLICATION

The Application proposed the following management plans to support mitigation of potential effects: noise, light, waste, wastewater, stormwater, marine access and transportation, security, spill, emergency response, worker safety, and separate emergency response communication plans for Indigenous Groups and local governments and the public. Additional Socio-Community specific mitigations include:

- Annual emergency response planning workshops: TJLP would annually engage local first responders and relevant local government staff to orient them to the site, identify areas of concern, and reduce uncertainty for first responders who may be called to respond to incidents on site; and
- Local and Indigenous Hiring and Procurement Policies: TJLP would require engineering, procurement, and construction contractors to have local and Indigenous hiring policies and strategies to maximize project employment for these groups. Annual reporting by the contractors and verified by a third party, would track success of recruitment and retention of local and Indigenous workers.

No additional mitigation measures were proposed by TJLP as part of the BVSA.

8.1.3 POTENTIAL PROJECT EFFECTS AND PROPOSED MITIGATIONS IDENTIFIED DURING APPLICATION REVIEW

During Application review, the Working Group did not raise concerns about key issues on Health and Emergency Services or Community Infrastructure. Key issues raised related to

Health and Well-Being are discussed in relevant VC chapters, including Human Health (Section 6.1), Noise (Section 6.2), Land and Marine Resource Use (Section 8.2), Visual Quality (Section 8.3), Economy (Section 8.4), Health and Socio-Economic Conditions of Indigenous Peoples (Section 11.3), and Current Use (Section 11.4).

8.1.4 THE EAO'S ANALYSIS AND CONCLUSIONS

This section presents the EAO's conclusions on the potential adverse residual effects from TMJ on the Socio-Community VC for the Application scenario and BVS.

The EAO evaluated the potential effects to Socio-Community by considering construction, operations and decommissioning activities that could affect Socio-Community through changes to health and emergency services, community infrastructure, and community health and well-being.

Residual Effects: After considering the proposed mitigation measures, the EAO concludes that there would be negligible residual adverse effects to the Socio-Community VC related to Health and Emergency Services or Community Infrastructure. The EAO has concluded on the pathway of effects (noise, night-time light, and other social determinants of heath) for Community and Well-being, which are assessed in the Human Health (Section 6.1), Noise (Section 6.2), Visual Quality (Section 8.3), Land and Marine Resource Use (Section 8.2), Economy (Section 8.4), Health and Socio-Economic Conditions of Indigenous Peoples (Section 11.3), and Current Use (Section 11.4) chapters in this Report.

8.1.5 CONCLUSIONS

Considering the above analysis and the proposed conditions in the TOC (which would become legally binding if an EAC is issued), and the recommended KMMs under CEAA 2012 (Appendix 1), the EAO is satisfied that TMJ would not have significant adverse effects on the Socio-Community VC.

8.2 LAND AND MARINE RESOURCE USE

8.2.1 BACKGROUND

Land and Marine Resource Use was selected as a VC because TMJ would be located in an important commercial transportation corridor used for deep-sea and domestic navigation, including Indigenous commercial fishing, commercial shipping, barging and towing, other commercial uses such as log storage and handling, commercial and recreational fisheries, and

other commercial and non-commercial land and marine use (for example, marine recreation). Marine vessels, including LNG carriers, that utilize the lower Fraser River shipping channels may have effects on Land and Marine Resource Use during construction and operations.

The Land and Marine Resource Use assessment relied upon the findings of Air Quality (Section 5.1), River Processes (Section 5.3), Vessel Wake (Section 5.4), Fish and Fish Habitat (Section 5.6), Marine Mammals (Section 5.7), Wildlife and Wildlife Habitat and Marine Birds (Section 5.9), Noise (Section 6.2) and Visual Quality (Section 8.3) assessments in the Application. The Land and Marine Resource Use assessment informed the assessments of Socio-Community (Section 8.2),Visual Quality (Section 8.3), Health and Socio-Economic Conditions for Indigenous Peoples (Section 11.3), and Current Use (Section 11.4) of this Report. A discussion of potential accidents and malfunctions related to TMJ marine activities are addressed under Accidents and Malfunctions (Section 9) of this Report.

Potential effects on Indigenous economic opportunities and other food, social, and ceremonial fisheries are assessed in Health and Socio-Economic Conditions for Indigenous Peoples (Section 11.3). Several Indigenous Groups engage in other marine use activities of traditional and cultural importance, and potential effects on these activities are also assessed in Current Use.

The Land and Marine Resource Use assessment was based on potential changes to navigation, commercial and non-commercial marine resource use (including Indigenous fishing), and commercial and non-commercial land resource use.

MARINE SHIPPING ASSESSMENT

Marine Resource Use was included as a VC in the MSA because TMJ-related shipping could affect access to and the use of marine areas for shipping and transportation and commercial and non-commercial marine resource use, including potential effects on Indigenous Groups with known commercial and non-commercial marine use interests and activities.

The Marine Resource Use assessment was based on potential changes to navigation, marine commercial use, and outdoor recreation.

8.2.1.1 REGULATORY CONTEXT

The following federal legislation and maritime requirements are applicable to Land and Marine Resource Use:

- *Canadian Navigable Waters Act*;
- *Canada Shipping Act* and its regulations governing marine safety and marine environment protection;
- *Canada Marine Act;*
- *Marine Liability Act;*

- *Marine Transportation Security Act*;
- *Pilotage Act*; and
- *Fisheries Act*.

The following provincial legislation is applicable to Land and Marine Resource Use:

- *Land Act.*

TMJ is not located on federal lands; however, the study areas for the assessment are in an area of the Fraser River where navigation is under the jurisdiction of the VFPA and FLNRORD has jurisdiction over the land covered by water.

MARINE SHIPPING ASSESSMENT

In addition to the regulatory context above, the MSA considered:

- The Canada-British Columbia Marine Protected Area Strategy which is a program that aims to create a marine protected area within 13 bioregions in Canada;
- Gulf Islands National Park Reserve Interim Management Guidelines, guiding policies, procedures and actions that protect the integrity and cultural heritage of the Gulf Islands Nation Park Reserve; and
- The Islands Trust Area that includes policy and planning objectives detailed in local government specific plans and bylaws to guide development in the Trust Area.

8.2.1.2 BOUNDARIES

The LAAs for the Land and Marine Resource Use VC varied by the subcomponent and its indicator; as such the Application assessment boundaries for this VC were (Figure 14):

- *Navigation LAA*: entire marine area of the South Arm of the Fraser River from the Fraser Surrey Docks downstream to Pilot Area 1 including the Sand Heads Lighthouse;
- *Marine Use LAA*: entire marine area of the South Arm of the Fraser River from the Fraser Surrey Docks downstream to the Sand Heads Lighthouse and includes a 1 km buffer on either side of the shipping lane; and
- *Land Use LAA*: includes land within two km of the TMJ site boundary and a 50 metre (m) buffer area along the foreshore of the South Arm of the Fraser River from Fraser Surrey Docks to the mouth of the Fraser River that could experience effects from LNG marine shipping (i.e., vessel wake) during operations.

For the Land and Marine Resource Use VC subcomponents, the RAA and the cumulative effects assessment area were the same as the LAA boundaries.

Two spatial boundaries were used for the Marine Resource Use VC in the MSA:

- The Marine Assessment Area (MAA) was the marine area between Sand Heads and the 12-nautical mile limit of Canada's territorial sea within the inbound and outbound shipping channels (**Figure** 15). The boundaries of the MAA were not an extension of the spatial boundaries described in the Application, but rather a separate, additional study area and was used in place of an RAA. The MAA was broken down into segments A through G to facilitate analysis; and
- The Marine Resource Use VC's Local Assessment Area (MLAA) for the MSA was the inbound and outbound shipping lanes (plus a two-km buffer extending on either side of these shipping lanes) that TMJ-related LNG carriers would use.

The same administrative (for example, DFO fisheries reporting areas) and technical boundaries (for example, automatic identification systems for vessels) that were considered in the Application were also considered and identified in the MSA.

8.2.2 POTENTIAL PROJECT EFFECTS AND PROPOSED MITIGATIONS MEASURES IN THE APPLICATION

8.2.2.1 BASELINE INFORMATION

The Fraser River has been used by Indigenous Groups for transportation, harvesting activities (hunting, trapping and fishing), trade and other cultural activities. Over the last 200 years, the Fraser River has served as a primary transportation corridor in the lower mainland for commercial industries such as forestry, agriculture, and fishing. Planned infrastructure projects, project population growth, and development of commercial lands adjacent to the lower Fraser River will place increased demands on the land and marine use along the lower Fraser River.

The EAO notes that during Application review, Tsawwassen First Nation identified errors in the Application from misrepresented information relayed from Tsawwassen First Nation reports, inconsistencies with language from the Tsawwassen Final Agreement, and updated fisheries information and report references. Tsawwassen First Nation drafted an erratum, which TJLP issued, to capture the corrected information.

8.2.2.1.1 Navigation

The South Arm of the Fraser River's deep-sea shipping channel is used by deep-sea shipping vessels, tugs, barges, commercial fishing boats, and pleasure crafts. It is connected to several domestic navigation channels that provide access to fishing vessels, tugs and barges, and commercial and pleasure boating traffic in the Marine Use LAA.

The Application noted that from July 2010 to June 2011, of the total number of vessel transits (14,336) past the TMJ site in the Fraser River, 83.7 percent were tugs and cargo ferries, 7.7 percent dredgers, and 7.5 percent deep-water vessels[107]; with the remaining 0.8 percent comprised of Search and Rescue (0.53 percent), Fishing (0.2 percent), Passenger (0.14 percent), unspecified (0.03 percent) and Pilot vessels (0.01 percent). In a separate study, estimated traffic in 2018 was not anticipated to grow substantially and the proportion of 2018 vessel traffic was predicted to remain similar to 2013 proportions used in the study.

In the Application, TJLP provided a navigation study (Appendix 1.0-1 of the Application) of potential risks associated with constructing and operating the TMJ marine terminal and associated LNG carriers and barges. The Application noted that Tsawwassen First Nation reported that their fishing vessels are frequently involved in near miss incidents on the Fraser River, mainly with deep-sea vessels. The study assessed the risk of collision, allision[108], grounding, and spills and provided mitigation measures to reduce risks following which, were considered low (see Section 9 Accidents and Malfunctions).

8.2.2.1.2 Commercial and Non-Commercial Marine Use

Commercial shipping is a key marine activity in the lower Fraser River, where automobile cargo, bulk and container cargo vessels, tugs and barges, and freight vessels are the common vessel types found.

The Seaspan Ferry Terminal is located approximately 200 m upstream of the TMJ site boundary. The terminal provides 28 weekly round-trip ferry services destined for Nanaimo, and 24 weekly round-trips destined for Swartz Bay. Seaspan also provides tug-related ship docking services to vessels calling terminals within the Port of Vancouver. The Lehigh Hanson Cement plant on Tilbury Island and the LaFarge Cement Plant in Richmond ship domestic drybulk goods such as aggregate and cement by tug and barge in the Fraser River.

The commercial salmon fishery is the main fishery in the Marine Use LAA. DFO regulates openings for commercial fisheries, by species (for example, sockeye, chum, and chinook). TMJ is located in Pacific Fishery Management Area (PFMA) 29 which is the primary harvesting area in Salmon Gillnet Management Area E, with fishing activity focused in-river and at the mouth of the South Arm of the Fraser River. In the Marine Use LAA, most commercial licences are related to Seine and gillnet (approximately 87 percent).

[107] Deep-water vessels include general cargo, bulk cargo, and container ships.

[108] "Allision" is when a vessel underway collides with a vessel at berth (that is, a stationary vessel).

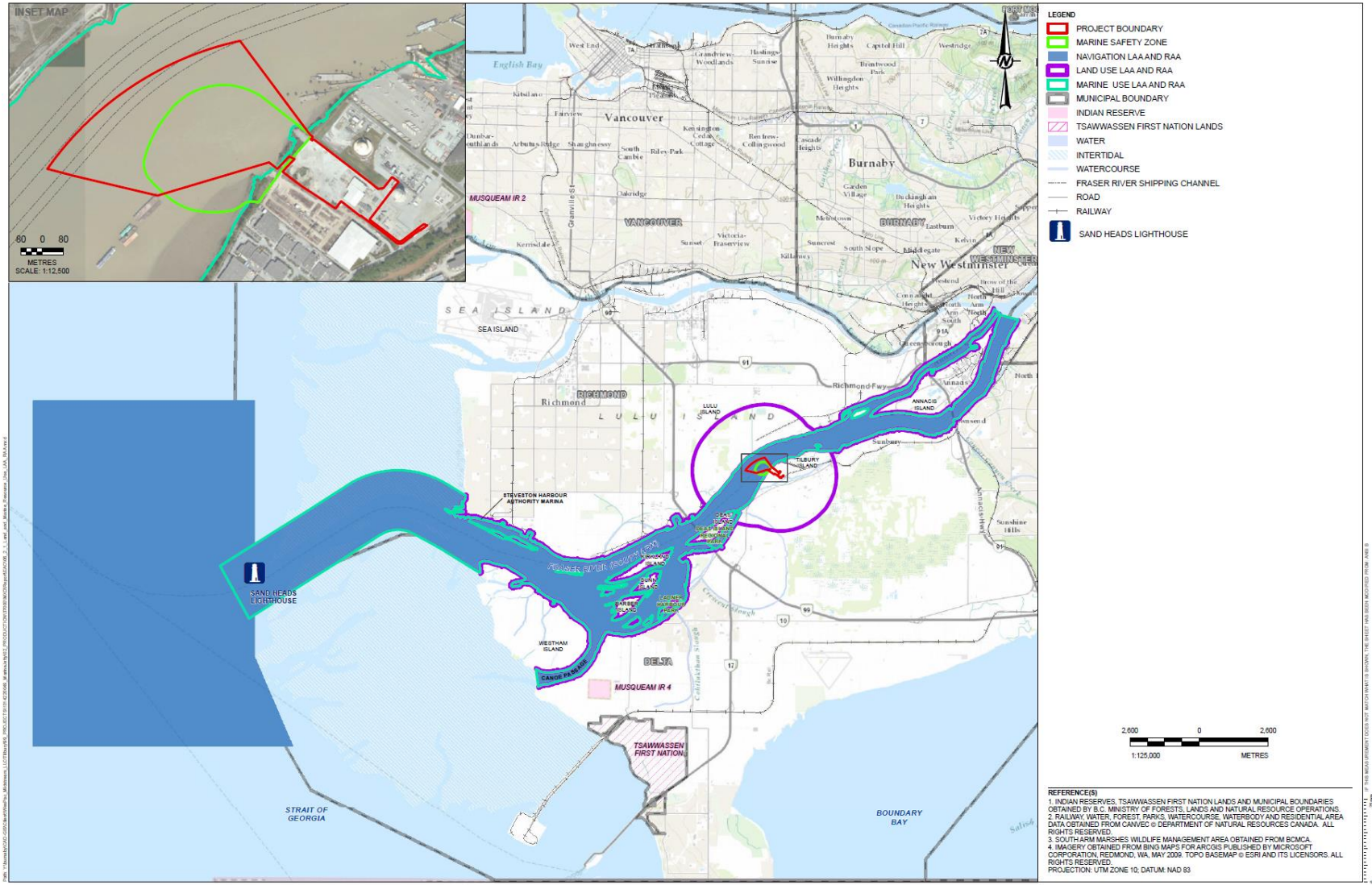

Figure 14: Local and Regional Assessment Areas for Land and Marine Resource Use VC (original Application area).

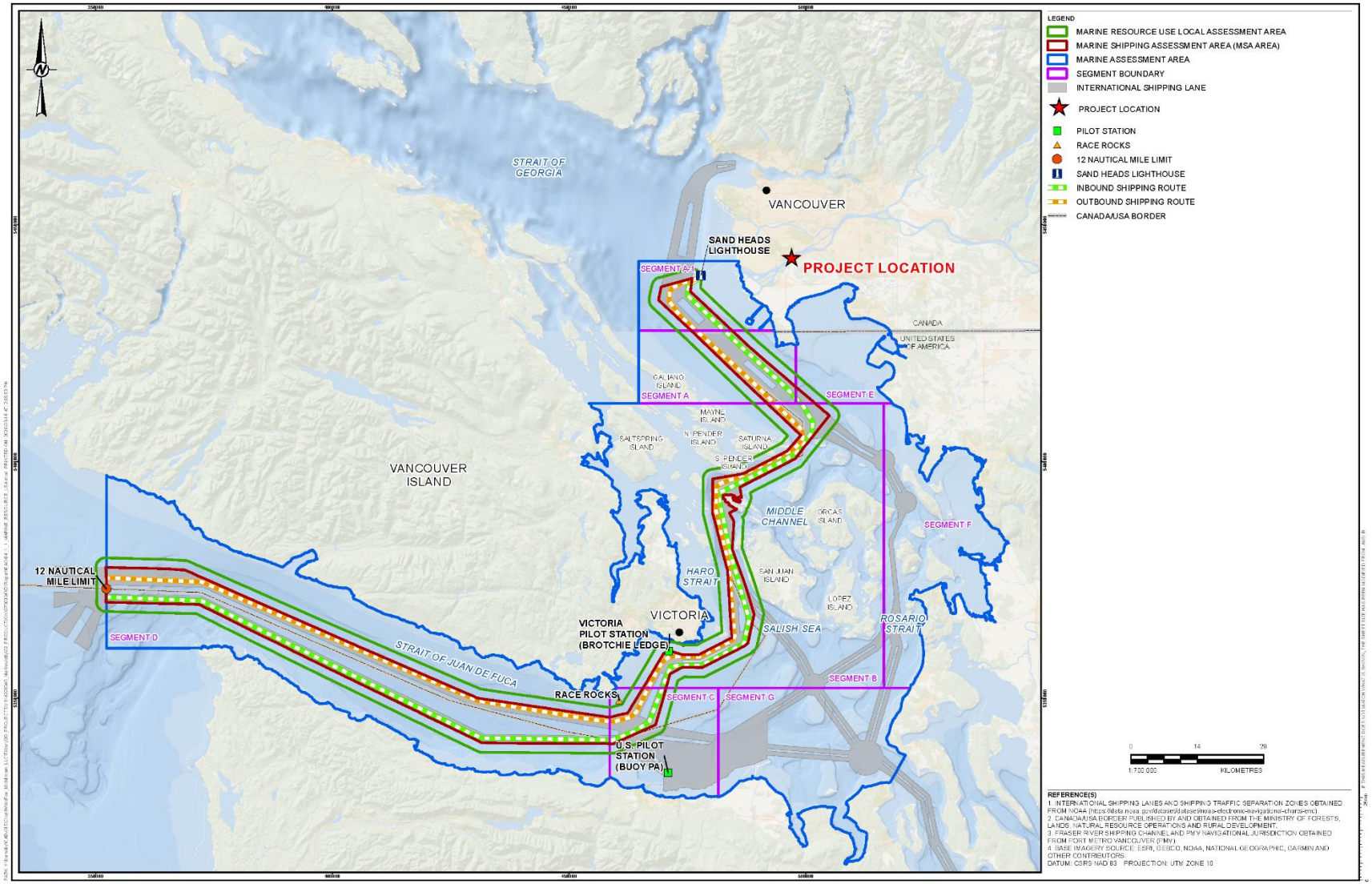

Figure 15: Marine Resource Use Assessment Areas for the Marine Shipping Assessment.

Indigenous Groups participate in fisheries for communal commercial (FA licence), and domestic purposes in the lower Fraser River and in the vicinity of TMJ under the licences issued. Tsawwassen First Nation, Tsleil-Waututh Nation, Hul'qumi'num Fisheries Society, Cowichan Tribes, and Salish Seas LP hold communal fisheries licences that allow the harvesting of salmon for commercial purposes in the Fraser River. Musqueam Indian Band and Tsawwassen First Nation currently have negotiated agreements[109] and Treaty agreements, respectively, that permit the sale of domestic or FSC fish.

Tsawwassen First Nation, Musqueam Indian Band, Penelakut First Nation, and Kwantlen First Nation hold commercial fisheries licences (separate from communal licences) that are valid in the Marine Use LAA. Portions of FSC fish and seafood allocations that are harvested under their FSC communal licence can be transferred to an economic opportunity licence. The Application noted that Musqueam Indian Band commercial harvesters have been affected in recent years due to higher levels of marine traffic in the Fraser River limiting the amount of time their gillnets can remain in the water and the requirement to move them to give way to other industrial marine users. The time spent moving nets lessens the narrow temporal window in which fish can be harvested in some cases.

Tsawwassen First Nation Final Agreement and Tsawwassen Harvest Agreement (THA) allows the Tsawwassen First Nation to fish the Fraser River up to the Port Mann Bridge. The THA allows for the operation of a commercial fishery for each year's salmon allocation of sockeye, chum and pink. Allocations are calculated based on run size or Total Allowable Catch and in some years, there are no THA fisheries. The Application noted that in some years Tsawwassen First Nation did not harvest their full allocation under the THA and in some cases transferred allocation to other Indigenous Groups up river for (commercial or non-commercial) fisheries when they are no longer able to access the fish or there are no further opportunities to harvest the fish.

The Fraser River is identified as a year-round destination sport fishery, with peak season generally occurring from June through September. The Application also noted that some members of Tsawwassen First Nation use their fishing vessels for tourism opportunities including wildlife tours and fishing charters on a casual basis.

The Application reported that along with recreational fishing and boating, other popular recreational water activities in the Marine Use LAA (e.g., Steveston Harbour, Westham Island,

[109] Musqueam Indian Band has an established Aboriginal right to fish for FSC purposes, as established in the Sparrow decision (R v. Sparrow, [1990] 1 S.C.R. 1075).

Deas Slough and South Arm Marshes) include kayaking, canoeing, water skiing, and stand-up paddle boarding.

8.2.2.1.3 Commercial Land Use

TMJ is located in the Tilbury Industrial Area, in Delta. The Application identified the properties overlapped by TMJ's onshore boundary and almost all the properties in the Land Use LAA on Tilbury Island are classified as Industrial land use. Other properties found in the Land Use LAA, not located on Tilbury Island, include Industrial, Agricultural, Road and Environmentally Sensitive Areas land use classes.

8.2.2.1.4 Non-commercial Land Use

Hunting, parks and trails, and bird watching were identified in the Application as the non-commercial land use activities that occur in the Land Use LAA. Hunting occurs both on land and water in the Land Use LAA, primarily for ducks and geese. The Application identifies portions of parks and protected areas that are overlapped by the Land Use LAA include Deas Island Regional Park, Burns Bog Ecological Conservation Area, Dow Delta Bar Fishing Park, and Tilbury Island. No formal trail networks or other designated areas (other than parks) were identified in the Land Use LAA.

MARINE SHIPPING ASSESSMENT

The MAA has been used by Indigenous Groups since pre-contact for transportation, marine harvesting activities (including fish, shellfish, and marine mammals), trade and other cultural activities. Marine transportation, commercial and non-commercial fish and seafood harvesting (including Indigenous commercial harvesting), marine tourism and marine recreational activities such as guided sport fishing, recreational fish and seafood harvesting, and recreational boating have a long history in the MAA. Additionally, there is a variety of residential development along the coastlines found in the MAA, including the Metro Vancouver area, the Lower Mainland, the Southern Gulf Islands, the Greater Victoria area and communities found in Puget Sound, in Washington State. Many recreational areas (shoreline access and beaches, walking and hiking trails, sightseeing etc.) as well as several national, provincial, and regional parks can be found in and adjacent to the MAA.

The MSA noted that current levels of use for these activities have caused increased pressure on fish stocks and changes in the environmental and social setting of the MAA.

Marine Transportation

TMJ vessels would use established shipping lanes through the Strait of Georgia, Boundary Passage, Haro Strait and the Strait of Juan de Fuca which are also utilized by a variety of other shipping vessels. There are also several established vessel traffic crossings along the shipping

lane, including BC Ferries and US public and private ferry systems that are active between ports in the MAA.

In Segment A of the MAA **(**Figure 15), 37 percent of total traffic was represented by passenger vessels including cruise ships and ferries. Cargo/ carrier vessel traffic represented approximately 20 percent of the total traffic in Segment A.

In Segment B of the MAA **(**Figure 15**),** both Haro Strait and Boundary Passage are relatively narrow passages, with strong tidal currents, and several navigational hazards. In 2017, 24 percent of vessel movements was from pleasure craft and sailing vessels in Haro Strait, in Segment B. The Application estimated by 2030, vessel movements in Segment B are expected to increase by close to 18 percent.

In Segment C of the MAA (**Figure** 15), 37 percent of traffic was represented by cargo and carrier ships. In Segment D, the Juan de Fuca Strait is used by cargo, container and tanker vessels for both inbound and outbound transits. Passenger ferry routes operating between Victoria and Washington State overlap with the shipping lanes in the Juan de Fuca Strait. Fishing vessels also operate during fishery openings, though there has been a decrease in large fishing vessels that transit through the strait due to a decline in profitability and changes in management regimes between 1995 and 2011. In Segment D (**Figure** 15), cargo, carrierships represented 42 percent of the traffic. Vessel traffic was predicted to increase by 34 percent and 33 percent, in Segments C and D, respectively, by 2030.

Commercial Marine Fish and Seafood Harvesting

Commercial fishing and seafood harvesting are managed by DFO in B.C. tidal waters, and the Washington Department of Fish and Wildlife is responsible for fishing and harvesting in US waters. Designated shipping lanes and navigable channels within the MLAA are used by commercial harvesters to transit and fish throughout the year. The MLAA overlaps with multiple Fisheries Management Areas and PFMAs. Commercial fisheries are allowed in PFMAs based on licences to harvest by fish or seafood species, and in some cases, by harvesting gear.

Indigenous Marine Fish and Seafood Commercial Harvesting

In the MLAA, Indigenous Groups have commercial, as well as economic opportunity fisheries through their agreements with DFO. The MSA reported that 469 communal commercial licences in the MLAA were held by Indigenous Groups, for harvest of halibut, herring spawn on kelp, prawn and shrimp by trap, red sea urchin, rockfish, salmon gillnet, and salmon troll. Commercial crab harvesting also takes place in segments of the MAA.

8.2.2.2 POTENTIAL PROJECT EFFECTS IN THE APPLICATION

The Application predicted potential effects to navigation use and navigability and commercial and non-commercial marine area use and access.

EFFECT ON NAVIGATION USE AND NAVIGABILITY

In the Application, adverse effects on navigation from decommissioning activities were considered negligible because marine vessel traffic volumes from TMJ-related vessels are anticipated to be minimal, including a one-time towing of the dismantled FTBB and piling for storage or reuse and therefore were not assessed further.

In the Application, TJLP assessed up to 68 LNG carrier vessel calls and up to 69 LNG bunker vessel calls annually during operations, with an anticipated average of one vessel every three days calling into the jetty, along with various tugs and a security monitoring patrol boat to monitor the proposed marine safety exclusion zone[110]. The LNG carriers (roughly 250 m long for the largest) would be piloted by a Fraser River Pilot and have three tethered tugs to assist in the 1-2-hour transit from Sand Heads pilot station (at the Sand Heads Lighthouse) to the TMJ site. The LNG bunker barges (approximately 120 m for the longest) would have a tethered tug.

In the Application, TJLP proposed a marine safety exclusion zone for public safety that would be approximately 20 ha in size and extend up to 300 m from the jetty structure[111]. TJLP predicted access to the TMJ site would be affected two to three times a week while vessels are berthing, loading and deberthing within the proposed zone, situated south of the outer limit of the navigation channel. Berthing and deberthing for all size of LNG carriers is anticipated to take less than one hour; vessel turning in the navigational channels is anticipated to take approximately 10 minutes. As required under the Collision Regulations, smaller vessels such as sailboats and fishing boats, must yield to larger vessels that are constrained by their draft. Therefore, smaller vessels transiting within the navigation channels in the LAA at the same time as TMJ-related vessels during construction and operations may need to occasionally change speed or direction to yield to larger TMJ-related vessels, resulting in minor transit delays. During LNG carrier turning in the navigational channel, movement of larger non-project vessels

[110] In the Application, TJLP proposed a "marine safety exclusion zone" / "marine security zone". In response to Working Group comments during Application Review, TJLP no longer proposes a spatially defined zone and instead proposes a protocol-based approach to ensure public safety ("Marine Safety Protocol"). Please refer to Section 8.2.3 below and Section 9.3 (in the Accidents and Malfunctions section) for more details. The term "marine safety exclusion zone" is used in Section 8.2.2.2 of this Report, consistent with the Application.

[111] Ibid.

(for example, large cargo vessels) could be intermittently restricted for approximately 10 minutes.

Construction dredging would take roughly 55 calendar days per year of construction and maintenance dredging (during operations) would take roughly 13 calendar days per year. TJLP concluded that effects on navigation from construction and operational dredging would be negligible.

EFFECT ON COMMERCIAL AND NON-COMMERCIAL MARINE AREA USE AND ACCESS

TMJ was predicted to affect commercial and non-commercial marine area use and access during construction and operations. During DFO fisheries openings, nets and other fishing equipment in the navigation channels would have to be moved so as not to impede vessels constrained by their draft. Construction-related vessels and LNG carriers and bunker barges underway could require smaller commercial vessels and recreational vessels to change course and speed in accordance with the Collision Regulations. TJLP compared TMJ-related vessels and large vessel traffic (that is, cargo and tanker traffic) as they would present a similar effect to marine users use and access. In the Application, TJLP predicted (based on 2018 projections) that operational LNG carrier and barge vessels for TMJ could comprise an estimated 6.5 percent of all large vessel traffic transiting the Southern Arm of the Fraser River up to the TMJ site[112]. TJLP concluded that potential effects would be limited by the small number of marine construction vessel movements and operational LNG carrier vessel movements of three times per week, the small size of the TMJ footprint and marine safety exclusion zone relative to the commercial and non-commercial use areas nearby, and the generally low usage of the area for sustained commercial and non-commercial recreational marine uses.

Access to and use of nearby land resources, including tenured areas, was not anticipated in the Application to be affected by the marine TMJ area nor the marine safety exclusion zone.

[112] In April 2022, TJLP updated predicted increases in vessel traffic due to TMJ, using 2018 baseline levels estimated near the TMJ site at Gravesend Reach and based on the BVS and more recent information about the size of the bunker vessels. The difference between the vessel traffic predictions in the Application and for the BVS is due to TJLP no longer counting bunker vessels as “large” vessels based on their smaller size. The updated predictions for the Application scenario of 137 vessel calls annually, is a 4.1% increase in large vessels and 1.2% increase for bunker vessel-size ships (comparable to size of a tug). For the BVS of 365 vessel calls annually, TJLP predicted a 3.5% increase in large vessels and 5.2% increase for bunker vessel-sized ships.

BUNKER VESSEL SCENARIO

In the BVSA, TJLP noted that the specifications of the LNG carriers did not change from what was assessed in the Application. However, new information about bunker vessels in development in the Port of Vancouver suggests that smaller bunker vessels are emerging as front-runner providers. Unlike the LNG barges, the bunker vessels assessed in the BVSA Report are not expected to require tug assist. Due to the size and maneuverability of the bunker vessels, bunker vessels are not expected to undergo large turns in the navigation channel and the durations of berthing/deberthing would be less. The cargo transfer operation process is expected to remain the same.

TJLP concluded that while there would be more bunker vessels calling at the jetty, the increased number of smaller bunker vessels would not restrict movement in shipping lanes to the same extent as the larger LNG carriers assessed in the Application. Similarly, all TMJ-related vessels would be required to conduct all operational marine shipping in accordance with the requirements of the *Canada Shipping Act* and other relevant navigation regulation and would be piloted by local pilots as required. TJLP stated that the potential interaction is consistent with what was assessed in the Application and did not conduct further assessment on navigation use and navigability.

In the BVSA, TJLP assessed the interaction between vessel berthing and deberthing with general commercial and non-commercial marine access and use, and between operational marine shipping from the TMJ site and Sand Heads and commercial salmon harvesting access and area use.

TJLP stated that while there would be more frequent bunker vessel calls under the BVS than what was assessed in the Application, individual bunker vessels would interact with other marine users accessing areas adjacent to the TMJ area for a shorter period of time. For the BVS, TJLP predicted a 3.5% increase in large vessels and 5.2% increase for bunker vessel-sized ships compared to baseline forecasts. The bunker vessels would be self-propelled and maneuverable enough to approach and berth or deberth without stopping to reposition, making the process quicker than for LNG carriers, resulting in less time for bunker vessels to potentially physically interact with other marine users accessing the areas adjacent to the TMJ site. TJLP concluded that the BVS is expected to be consistent with the findings of the Application and that no further assessment of the effects of berthing/deberthing of TMJ-related vessels on commercial and non-commercial marine use and access is required.

During commercial salmon openings, nets on commercial fishing vessels dropped within the navigational channels would need to be removed from the navigation channels (per regulatory requirements) so as not to impede other vessel traffic. These interactions would occur more frequently, up to twice a day, compared to twice every three days assessed in the Application.

TJLP noted that while this increases the likelihood of a commercial salmon harvester being required to move their nets to allow for TMJ-related LNG carrier or bunker vessel to transit through the shipping lane, this would only occur during commercial salmon harvesting openings. Commercial salmon harvesters are used to, and required to under the federal Collision Regulations, give way to vessels transiting in the shipping lanes. TJLP concluded that the findings of the BVSA are consistent with the Application.

MARINE SHIPPING ASSESSMENT

The MSA assessed potential interactions between marine shipping components and marine resource use activities. TJLP stated that all TMJ-related vessels would be piloted by local, experienced, professional pilots to minimize change in navigability as a result of TMJ. TJLP also anticipated that the vessel traffic associated with TMJ would only represent an increase of 0.5 percent in Segment A, a 0.2 percent increase in Segment B, and a 1.1 percent increase in Segments C and D of the total vessel movements relative to existing conditions. Given this minimal increase in TMJ-related vessel traffic and the temporary nature of any displacement of other smaller marine vessels that TMJ-related vessels would be anticipated to interact with, TJLP found negligible effects for all interactions assessed.

8.2.2.3 MITIGATION MEASURES PROPOSED IN THE APPLICATION

TMJ Project Design mitigations include implementing any TC recommendations from the Navigation Study review, implementing navigational lighting and navigational aid requirements, and timing for in river construction to avoid commercial fishery openings.

The Application proposed the following mitigation measures:

- Timing construction activities to avoid commercial salmon fishery openings;
- Marine access and transportation management plan which would include a description of the activities and procedures to reduce effects to commercial and non-commercial vessel navigational passage and provide consultation opportunities for key marine user groups (for example, Indigenous Groups and commercial marine transport operators); and
- Marine Communication Plan, developed in consultation with Indigenous Groups, and include measures to reduce effects to marine navigation, marine access/ use, and commercial and recreational Indigenous fishers as well as traditional use activities, that include fishing for FSC or domestic purposes.

No additional mitigation measures were proposed by TJLP as part of the BVSA.

The MSA noted that required compliance with national and international maritime regulations is anticipated to be highly effective in addressing potential effects to navigation. Due to

negligible effects predicted to the Marine Resource Use VC (MSA), there were no additional mitigation measures proposed in the MSA.

8.2.3 POTENTIAL PROJECT EFFECTS AND PROPOSED MITIGATIONS IDENTIFIED DURING APPLICATION REVIEW

The following key issues related to the assessment of Land and Marine Resource Use for TMJ were identified during Application review and based on feedback from the Working Group.

MARINE ACCESS AND THE MARINE SAFETY EXCLUSION ZONE

Musqueam Indian Band, Tsleil-Waututh Nation and Tsawwassen First Nation raised concerns about the proposed "marine safety exclusion zone" and the importance of maintaining access for marine users for traditional (assessed in Current Use, Section 11.4) and economic purposes. Concerns were also raised that the cumulative effects of increased shipping in the Salish Sea and the Fraser River are affecting their ability to access and harvest resources. The EAO also heard similar concerns from Pacheedaht First Nation, Ditidaht First Nation, and Maa-nulth Treaty Society regarding the cumulative effects of increased shipping traffic within the MSA through both direct engagement on TMJ and as part of the RBT2 Panel report.

TC, and VFPA raised concerns about potential effects of the proposed marine safety exclusion zone to navigation and BC OGC, TC, and VFPA requested additional details on the marine safety exclusion zone protocols during LNG carrier transit, berthing, and loading of LNG. TC, BC OGC, VFPA, CCG, Musqueam Indian Band and Cowichan Nation Alliance inquired whether the berthing of LNG carriers and the related marine safety exclusion zone could affect navigation and marine user access.

> In the Application, TJLP proposed a marine safety exclusion zone for public safety, that would be approximately 20 ha in size and extend up to 300 m from the jetty structure. In response to VFPA and TC concerns raised during Application review about the potential effect of the marine safety zone exclusion on navigability, TJLP proposed a revised, protocol-based approach to provide for public safety and reduce the potential for interference with navigation. Instead of a zone, TJLP proposed a Marine Safety Protocol[113] to come into effect during construction (once the FTBB is in operation) and remain in place for the life of TMJ for the purpose of public safety. TJLP would post

[113] TJLP Marine Safety Protocol v. 3.1, dated April 28, 2021 (https://www.projects.eao.gov.bc.ca/api/public/document/60a562697429e10022397830/download/20210428_TMJ%20Marine%20Safety%20Protocol.pdf).

signage along the jetty notifying river users of the presence of hazardous substances and to exercise caution in the vicinity of the TMJ, and would work with the VFPA, the Pilotage Authority and the MCTS to communicate the presence of an LNG ship at the berth for the information of other vessels on the river. TJLP proposes varying levels of site-specific operational measures to implement. Measures range from observing passing vessels, to announcing to the vessels that they are in the vicinity of LNG operation and that for safety reasons the vessel should take proper precautions, to suspension of LNG loading operations.

Upon review of the proposed Marine Safety Protocol, the OGC, TC, and VFPA were satisfied with the operational protocols to reduce public safety risk, and that the proposed protocols would not obstruct navigation and were consistent with applicable laws and regulations. Should TMJ proceed to the regulatory phase, a formal application to TC to seek approval(s) under the *Canadian Navigable Waters Act* would be required.

To reduce potential shipping-related effects to fishers (recreational, commercial, and Indigenous) during DFO fisheries openings, those construction activities that are associated with a higher number of vessel movements and delivery of materials by marine transportation would be timed to avoid commercial fishery openings. TJLP noted that their marine communication plan would set out the protocols to communicate TMJ-related shipping with the marine users and Indigenous Groups and the marine access and transportation management plan would describe of the activities and procedures to maintain commercial and non-commercial vessel navigational passage to Sand Heads.

Based on the description of the Marine Safety Protocol provided by TJLP during Application review, the EAO understands that mariners may enter or pass through the marine terminal area and TJLP have operational measures in place for public safety. For the purpose of the EA, the EAO has taken a conservative approach in the effects assessment and has assumed that mariners would avoid entering and remaining in the marine terminal area due to the warning signs and notifications regarding elevated public risk, in particular during TMJ-related vessels berthing, loading and de-berthing activities (on average, daily in the BVS) at full capacity.

The EAO recommends KMMS under CEAA 2012, for a Marine Access and Transportation Plan for the Fraser River and a Marine Communication Plan. The Marine Access and Transportation Plan requires identification of marine use and navigation from the TMJ site to Sand Heads, including commercial and non-commercial routes and use areas, and any associated timing windows. The plan must describe how TJLP would coordinate activities and communicate with other marine users and regulators, mitigations to reduce disruptions for commercial and non-commercial marine use, and measures to maintain navigation and safety. The Marine

Communication Plan would identify procedures to notify Indigenous Groups and other marine users of planned activities associated with TMJ, including the type of information to be communicated, such as anticipated traffic schedules and timing of distribution of information. The plan would include procedures for Indigenous Groups and other marine users to provide feedback to TJLP on adverse effects on navigation and for TJLP to document and respond to issues raised.

8.2.4 THE EAO'S ANALYSIS AND CONCLUSIONS

This section presents the EAO's conclusions on the potential adverse residual effects from TMJ on the Land and Marine Resource Use VC and Marine Resource Use VC (MSA).

The EAO evaluated potential effects by considering construction, operations and decommissioning activities that could affect the Land and Marine Resource Use VC and the Marine Resource Use VC (MSA) by a change in navigation, commercial and non-commercial marine resource use (including outdoor recreation), and commercial and non-commercial land resource use.

Key Mitigation Measures (CEAA 2012)

Based on mitigations proposed in the Application and issues raised during Application review, the EAO recommends the following KMMs under CEAA 2012:

- Marine Access and Transportation Plan (jetty to Sand Heads) - to identify methods to coordinate activities and communicate with other marine users and regulators and mitigation to reduce disruptions caused by construction and operations for commercial and non-commercial marine use (KMM); and
- Marine Communications Plan (jetty to 12 nm limit) - to identify procedures to notify marine users of planned activities associated with TMJ (including the type of information to be communicated, such as anticipated traffic schedules and timing of distribution of information), and procedures for marine users to provide feedback and for TJLP to document and respond to issues raised (KMM).

Residual Effects: After considering the proposed mitigation measures, the EAO predicts that TMJ would result in residual effects to commercial and non-commercial marine users from the proposed jetty to Sand Heads for the Application scenario and BVS. The EAO predicts effects as a result of construction and operational marine vessel movement and interference with commercial and recreational marine users transiting the TMJ site.

The EAO's characterization of the expected residual effects of TMJ on the Land and Marine Resource Use VC and Marine Resource Use VC (MSA) are summarized below, as well as the

EAO's level of confidence in the effects determination (including their likelihood and significance).

Table 28: Summary of residual effects to commercial and non-commercial marine users.

Criteria	Assessment Rating	Rationale
Context	Moderate to High resilience	Along the established shipping routes and the Fraser River area, which is highly industrialized, marine users are commonly required to accommodate temporary interferences, such as disturbances related to transiting and berthing, as well as shipping/ transiting activities. Indigenous Groups have raised concerns that increased shipping in the Fraser River and Salish Sea is affecting their ability to access and harvest resources.
Magnitude	Negligible (MAA) to low	Transiting, turning, berthing, and deberthing of LNG carriers (and their support vessels) and bunker vessels have the potential to result in short term disruption. Occasionally, commercial harvesters, tourism and recreational users may be required to reduce speed or direction to yield to larger TMJ-related vessels and/ or remove commercial fishing nets while vessels are navigating through. Mariners may enter or pass through the marine terminal area; however, the EAO has conservatively assumed that mariners and Indigenous Groups are predicted to avoid entering and remaining in the marine terminal area due to the warning signs and notifications regarding elevated safety risk in the terminal area due to LNG berthing, loading and de-berthing activities (approximately one vessel call per day, on average, in the BVS). At the scale of the LAA and RAA this would amount to a low magnitude effect to access at the TMJ site. The overall increase in construction and operational marine vessels in the Marine Use LAA is low relative to the overall number of vessel movements that occur in this part of the Fraser River. In the Application scenario, operational LNG carriers would increase large vessel traffic by 4.1% and bunker barges would increase similar sized vessel traffic by 1.2%[114]. For the BVS, LNG carriers are predicted to increase large vessel traffic by 3.5%, and bunker vessel-sized traffic by 5.2%. For all vessels, the Application and BVS are predicted to increase vessel traffic by 1.5% and 4%, respectively. Residual effects in the Marine Use LAA are predicted to be low magnitude. In the MAA, the anticipated vessel traffic associated with TMJ would be up to 236 ship movements per year, representing an increase of 0.5 percent in Segments A, 0.2 percent in Segments B, and 1.1 percent in Segments C and D of the total vessel movements relative to existing conditions. Residual effects to commercial fishing, including commercial harvesting areas of the First Nations

[114] In 2022, TJLP predicted the increase in vessel traffic due to TMJ, based on 2018 baseline levels estimated near the TMJ site at Gravesend Reach. For the Application scenario of 137 vessel calls annually, TJLP predicted a 4.1% increase in large vessels and 1.2% increase for bunker vessel-size ships (comparable to size of a tug). For the BVS of 365 vessel calls annually, TJLP predicted a 3.5% increase in large vessels and 5.2% increase for bunker vessel-sized ships.

Criteria	Assessment Rating	Rationale
		of the Maa-nulth Treaty Society in Segment D that overlap the shipping lanes, are predicted. For all other Indigenous Groups, the EAO is of the view that 236 TMJ-related vessel movements per year would not affect commercial fishing ventures taking place in the MSA. Residual effects to the experience of commercial and non-commercial marine users conducting their activities are expected to diminish with increased distance from TMJ vessels in transit (see extent below) and are predicted to be negligible in magnitude.
Extent	Regional	Effects to commercial and non-commercial marine users are expected to be regional, with various vessels transiting throughout the region.
Duration	Long-term	The residual effect is long-term, spanning construction and operations. Construction-related vessels transporting materials, decommissioned infrastructure and equipment to and from the TMJ site would transit in the Marine Use LAA. During operations, operational LNG carriers and barges, tugs and security monitoring patrol boats would transit the Southern Arm of the Fraser River to Sand Heads and out to the 12 nm limit.
Frequency	Frequent to Continuous	The residual effect would be intermittent and limited by the small number of marine construction vessel movements during construction and frequent due to operational LNG carrier and barge vessel movements (an average of one vessel call to the jetty or two vessel movements each day for the BVS). The EAO has conservatively assumed that mariners and Indigenous Groups are predicted to avoid entering and remaining in the marine terminal area during operations; therefore, the residual effect would be continuous. Given the number of transits of the Salish Sea and the short time period to transit from the 12nm limit of Canada's territorial sea to the TMJ jetty, residual effects on commercial and non-commercial marine users from vessels in transit are predicted to be frequent.
Reversibility	Reversible	The residual effect to commercial and non-commercial marine users would be reversible after TMJ operations ceases.
Likelihood	The EAO considers the likelihood of residual effects on commercial and non-commercial marine users from the jetty to Sand Heads due to TMJ-related vessels to be high.	
Significance	In consideration of the above analysis and the recommended the KMMs under CEAA 2012 for Marine Access and Transportation Plan and Marine Communication Plan, the EAO is satisfied that TMJ would not have significant adverse residual effects on commercial and non-commercial marine users.	
Confidence	The EAO has a moderate to high level of confidence in the effects assessment considering the availability of information regarding existing commercial and recreational marine use activities and uses, the predicted effectiveness of mitigation measures and BMPs that have been applied to LNG jetty and terminal projects, and compliance with national and international maritime regulations. However, the EAO also recommends KMMs under CEAA 2012 for a Marine Access and Transportation Plan and Marine Communication Plan to mitigate potential effects.	

Note: Criteria and assessment ratings are defined in Appendix 5: Residual Effects Characterization Definitions.

8.2.5 CUMULATIVE EFFECTS ASSESSMENT

Residual effects predicted for the Land and Marine Resource Use VC related to commercial and non-commercial marine users were carried forward for the cumulative effects assessment.

For the Application scenario, TJLP predicted the increase in vessel traffic (over 2018 conditions) as a result of TMJ to be ~1.5% (increase of ~4.1% in large vessel traffic and ~1.2% in bunker/tug -sized vessel traffic). For the BVS, TJLP predicted the increase in vessel traffic (over 2018 conditions) to be ~4% (increase of ~3.5% in large vessel traffic and ~5.2% in bunker/tug-sized vessel traffic. Based on a 2016 VFPA analysis[115], vessel traffic along the Fraser River peaked in the early 2000's and has since experienced a notable decline. Adding projected vessel calls associated with projects that have been permitted or may be permitted to the current vessel numbers, Fraser River vessel traffic is forecast to recover to levels similar to those attained in the early 2000's.

The effects of other existing projects and activities that have already been implemented (construction and operation) are considered as part of the existing conditions for the Land and Marine Resource Use VC. The EAO considered the following reasonably foreseeable future projects and activities that could potentially interact cumulatively with TMJ. The VAFFC will barge fuel once every two weeks and receive a Panamax class vessel delivery once a month within the Marine Use RAA. PBRP will have a maximum of three vessel trips per week through the South Arm of the Fraser River during construction (six years) and a higher number of barges and tugboats will be required over the 15-day period when the existing bridge is removed. Delta Grinding would comprise around 30 Panamax class vessel movements a year. FortisBC Tilbury Phase 2 LNG Plant Expansion is expected to increase marine shipping traffic during construction (up to 3 years) as part of the temporary construction jetty and delivery of project equipment modules. Although details were not available for the Seaspan Ferries Tilbury Terminal Expansion, Fraser River Tunnel Project, and Deas Island BC Hydro Transmission Line, there may be potential cumulative interaction with commercial and recreational marine access due to additional vessels.

Smaller commercial and non-commercial recreation vessels using the channel at the same time as vessels associated with TMJ, and the projects listed above may experience minor transit delays. Removal of commercial fishing vessel nets dropped in the navigational channels would

[115] Vancouver Fraser Port Authority. 2016. Backgrounder: The Fraser River and future trade. https://www.portvancouver.com/wp-content/uploads/2017/05/2017-05-25-Backgrounder-Future-of-the-Fraser-River.pdf

be required (regulatory requirement) to avoid impeding TMJ-related marine vessel traffic. Additionally, commercial and recreational vessels may have temporary restricted area use and access in the navigational channels from barges and Panamax vessels associated with the VAFFC and Delta Grinding Facility or vessels associated with FortisBC Tilbury Phase 2 LNG Plant Expansion or Seaspan Ferries Tilbury Terminal Expansion during the berthing and deberthing period.

TJLP assumed that these other projects would apply mitigation measures similar to those of TMJ to address effects on commercial and non-commercial marine area use and access. The EAO notes that the RBT2 Panel Report recommended several mitigation measures that are considered beyond the scope of the TMJ EA to implement, for example exploring options for the relocation of the shipping lanes and regional assessment EAs for both the Fraser River and Salish Sea). The residual cumulative effects on commercial and non-commercial marine area use and access would be temporary and would not compromise the ability for Indigenous domestic and commercial fisheries, commercial, recreational and tourism marine activity to continue. For the Application scenario and BVS, the EAO concludes that any cumulative effect would be low in magnitude and not significant for marine use.

A cumulative effects assessment on Marine Resource Use in the MSA was not conducted as TMJ-related vessel movements are predicted to have a negligible residual effect on the Marine Resource Use VC (MSA). The anticipated vessel traffic associated with TMJ would not represent a substantive increase in the total vessel movements relative to existing conditions in the MSA.

8.2.6 CONCLUSIONS

Considering the analysis above and the conditions identified in the CPD and TOC (which would become legally binding if an EAC is issued), and recommended KMMs under CEAA 2012 for a Marine Access and Transportation Plan and Marine Communication Plan (Appendix 1), the EAO is satisfied that TMJ would not have significant adverse residual effects or cumulative effects on the Land and Marine Resource Use VC or Marine Use Resource VC (MSA).

8.3 VISUAL QUALITY EFFECTS

8.3.1 BACKGROUND

Visual Quality was assessed as a VC because TMJ has the potential to alter aesthetic aspects of the landscape related to public enjoyment of scenic views and because of its regulatory and social importance, as well as importance to Indigenous Groups. The visual quality effects assessment is supported by the Vegetation (Section 5.8), Socio-Community (Section 8.1), Land

and Marine Resource Use (Section 8.2), Health and Socio-Economic Conditions of Indigenous Peoples (Section 11.3) and Current Use (Section 11.4) VCs which are considered pathways to the Visual Quality VC.

In the MSA, TJLP presented the potential effects of marine shipping associated with TMJ on the Visual Quality VC for the area beyond the RAA.

8.3.1.1 REGULATORY CONTEXT

The following key regulatory requirements, guidelines, standards and BMPs informed the scope and methods of the visual quality effects assessment for TMJ:

- *Canadian Environmental Assessment Act, 2012* (CEAA 2012);
- *BC Oil and Gas Activities Act,* (BC OGC, 2015); and
- Vancouver Fraser Port Authority Project and Environmental Review Guidelines for View; Shade, and Lighting (VFPA, 2015b).

8.3.1.2 BOUNDARIES

The LAA for the Visual Quality VC includes the TMJ site boundary plus a five km area, a distance that allows viewers to observe a reasonable level of visual detail. A one km buffer was included in the LAA along the shipping route from the TMJ site boundary to Sand Heads to assess potential effects on sensitive receptors along the shipping route (Figure 16).

The RAA includes all areas within 10 km on the TMJ site boundary with an additional 1.5 km buffer along the shipping route, ending at Sand Heads. This represents the farthest reasonable distance TMJ's components could be visible. The 1.5 km viewing buffer provides a regional context for the visual quality assessment along the shipping route in the Fraser River.

The MSA LAA for the Visual Quality VC is composed of a collection of key viewpoints and receptors from locations representing a range of viewing opportunities within the Gulf Islands, and along the shoreline of Greater Victoria and Juan de Fuca Strait. The spatial boundary of the MSA RAA is comprised of all areas within 15 km of the MSA shipping lanes. Both the MSA LAA and RAA extend from Sand Heads to the 12-nautical miles limit of Canada's territorial sea at the mouth of the Strait of Juan de Fuca.

8.3.2 POTENTIAL PROJECT EFFECTS AND PROPOSED MITIGATIONS IN THE APPLICATION

8.3.2.1 BASELINE INFORMATION

The LAA was described in the Application as a suburban residential, industrial, recreational, marine and natural land-use setting with locations of importance and interest to Indigenous Groups including cultural heritage sites and potential viewing opportunities.

Based on the observations for the landscape character, the Application described various viewpoints and assigned Landscape Ratings[116] (Table 29). Viewpoints were used throughout the Application to describe and assess the Visual Quality VC.

Table 29: Viewpoints and Landscape Ratings

Viewpoint	Location	Landscape Rating
Viewpoint 1 (VP1)	Riverport Flats: Residential and recreational area	High
Viewpoint 2 (VP2)	Dyke Road (area of a former Indigenous Village site)	Low
Viewpoint 3 (VP3)	Fraser River (Upstream): Marine-based view in the Fraser River	Low
Viewpoint 4 (VP4)	Fraser River (Downstream): Marine-based view in the Fraser River	Moderate
Viewpoint 5 (VP5)	Tilbury Industrial Park: Commercial and Industrial area	Low
Viewpoint 6 (VP6)	Deas Island Regional Park: Park and recreation area	Moderate
Viewpoint 7 (VP7)	Garry Point Park: Park and recreation area	High

The LAA identified three key nighttime viewpoints (VP1, VP2, and VP6) as having low level of brightness relating to light trespass. The remaining key nighttime viewpoint, VP5, had a high district brightness for light trespass. All four viewpoints had a high level of ambient light, described as sky glow. The closest prominent light source to TMJ and highest environmental light zone classification[117] of the four key nighttime viewpoint is VP5, attributed to the surrounding industrial facilities. The high ambient lighting levels at VP5, and most evident in the LAA, is associated with the regional urban areas of Metro Vancouver.

[116] The Landscape Rating combines qualitative values assessing scenic quality, viewer sensitivity and viewing distance. Landscape ratings of High, Moderate and Low were used to classify the overall value of the landscape's existing visual quality.

[117] Environmental lighting zones for classifying light levels were determined through field observations, analysis of baseline photographs, and measurements of average illuminance levels and sky glow levels.

MARINE SHIPPING ASSESSMENT

The MSA assessed two potential interactions to the Visual Quality VC: vessel transit increasing the visibility of industrial shipping activity within the existing daytime viewing conditions for residents, tourists; and increased visibility of light emissions within the existing nighttime viewing conditions along the marine shipping corridor.

The MSA stated that existing conditions were determined using on-site observations, spatial analyses and supporting assessments of TMJ-related shipping activity along the marine shipping corridor. This included Indigenous input through the engagement process, public documents, academic reports and material submitted by Indigenous Groups including traditional use and TEK studies.

For existing daytime viewing, the MSA used shoreline mapping data, and photographic field surveys from public viewpoints captured during daytime viewing conditions to develop a seascape character analysis along the marine shipping corridor:

- Viewpoint 1 (VP1) – Galiano Island
- Viewpoint 2 (VP2) – East Point Park
- Viewpoint 3 (VP3) – Sidney Spit
- Viewpoint 4 (VP4) – Mount Douglas Park
- Viewpoint 5 (VP5) – Clover Point Park
- Viewpoint 6 (VP6) – East Sooke Park
- Viewpoint 7 (VP7) – Botanical Beach

For existing nighttime viewing, the MSA measured light trespass (measured in lux) and skyglow at the seven viewpoints listed above. Light trespass for all viewpoint locations were classified as areas having low ambient brightness.

8.3.2.2 POTENTIAL PROJECT EFFECTS

The potential effects to the Visual Quality VC would result from TMJ components that alter the appearance and character of the existing landscape setting during daytime viewing, while TMJ lighting would affect nighttime viewing. These effects are anticipated to occur during all TMJ phases, most prominently during operations.

TEMPORARY VISIBILITY OF CONSTRUCTION-RELATED EQUIPMENT, LIGHTING, VESSELS, AND ACTIVITIES DURING CONSTRUCTION AND DECOMMISSIONING ACTIVITIES

A temporary increase in visibility of construction-related structures, vessels, equipment and activities would alter the daytime viewing conditions. The Application states that the majority of construction activities and equipment would be visible only to the viewers adjacent to the work sites within the three-year construction period.

The FTBB facility would also be visible during construction of the permanent jetty structure and would be decommissioned once the permanent jetty is fully operational. Decommissioning-related visual effects are expected to be comparable to those associated with construction as these activities are expected to include similar equipment and activities.

During construction and decommissioning, visible light sources and light levels are expected to increase temporarily for up to three years and are expected to occur up to 24 hours per day. This is due to the requirement for lighting systems such as flood lights and navigational lights during nighttime hours for worker safety, site security and navigation.

PRESENCE OF VISIBLE PROJECT COMPONENTS AND TEMPORARY VISIBILITY OF MARINE VESSEL MOVEMENTS DURING OPERATIONS

TMJ onshore and offshore facilities would reach their full extent at the beginning of operations and are predicted to present the largest and most persistent contribution of adverse visual effects on the existing landscape. As the FTBB is decommissioned, the presence of visible TMJ components and temporary visibility of marine vessel movements is anticipated to increase the visibility of the marine industrial infrastructure and activity along the Fraser River. The assessment considered onshore and offshore facilities, LNG carriers/ bunkering vessels and tug assists, as well as an access road.

TMJ would be visible from most viewing locations and is predicted to have a generally low level of contrast with the existing environment. The Landscape Rating was compared to the contrast rating to identify the level of visual effect.

Fixed lighting on-site for both onshore and offshore facilities during nighttime operations activities is expected to introduce additional perceivable light sources to the baseline conditions in the LAA. Navigation lighting from marine shipping vessels would also contribute to additional perceivable light sources in the LAA as well as along the shipping route to Sand Heads. Lighting effect ratings from key nighttime viewpoints assessed VP1, VP2 and VP6 at a low lighting effect rating and VP5 as negligible, indicating that the perceivable light sources would not increase the existing level of brightness locally or regionally.

BUNKER VESSEL SCENARIO

The Application identified two TMJ operational activities associated with marine shipping in the LAA that could affect daytime and nighttime viewing: 1) Temporary visibility of marine vessel movements during operations (daytime viewing); and 2) Visibility of lighting related to site safety and navigation during operation (nighttime viewing). In the Application, potential visual quality effects associated with these activities were predicted by TJLP based on the LNG carrier vessels, which are more visually prominent than the smaller bunker vessels. The frequency of the residual effects were characterized as “continuous” for daytime viewing and “frequent” for

nighttime viewing and the visual effect was expected to occur as long as TMJ is operational. In the BVSA, TJLP stated that the analysis in the Application was based on a larger vessel size with greater potential for visual impacts, and that the reduced frequency of LNG carriers combined with the increased frequency of bunkering vessels is not anticipated to result changes to the assessment of Visual Quality compared to what was originally assessed in the Application.

VISIBILITY OF VESSELS AND LIGHTING IN THE MARINE SHIPPING ASSESSMENT

Vessel viewing distances ranged from 1 km to 10 km. Frequency of the vessel movements for TMJ would be expected to be regular with five vessel movements per week, visible from each viewpoint. The viewing duration of the vessel movements would average 24 minutes at each viewing location. Overall, TMJ-related shipping activity would be visually evident, and viewers would be exposed to it for a regular but relatively brief period with vessels appearing small in scale and indistinct within the broader seascape context.

In the MSA, the VP2 (East Point Park) viewing location represented the highest predicted change in illuminance and sky glow levels resulting from TMJ-related shipping. All other viewing locations had no increase in predicted illuminance and had predicted sky glow increases ranging from 0.00 percent to 0.56 percent brightness above natural background levels. The predicted increase in light emissions from TMJ-related vessel movements is described as temporary and limited to LNG carrier transits through the viewing locations. The classification for light trespass and sky glow are predicted to remain within the levels described under existing conditions for all viewing locations except for VP2 (East Point Park) in the MSA. Sky glow levels at VP2 (East Point Park) would temporarily increase its environmental lighting classification more closely to that of a suburban residential area compared to an area of low district brightness or suburban residential, respectively, under the existing conditions.

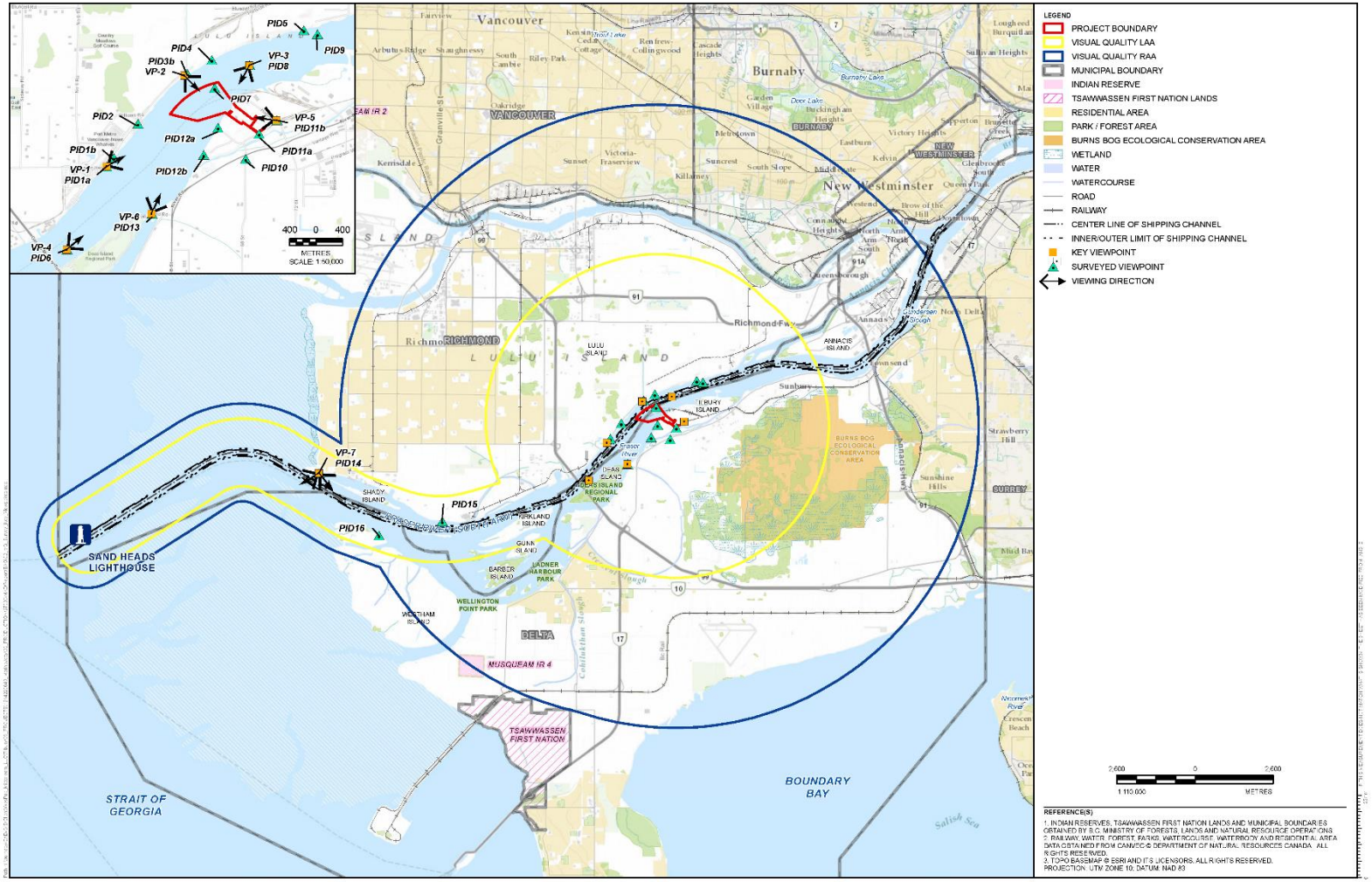

Figure 16: Visual Quality Baseline depicting LAA and RAA for the Original Application Area (jetty to Sand Heads).

8.3.2.3 MITIGATION MEASURES PROPOSED IN THE APPLICATION

The Application proposed the following mitigation measures and practices to reduce or eliminate an adverse effect, or enhance a positive effect to Visual Quality, including in the Marine Shipping Assessment:

- Project Design Mitigation:
  - Remove remaining and or existing abandoned marine infrastructure to a suitably permitted off-site facility during construction;
  - Conduct construction activities primarily during daylight hours;
  - Remove construction and decommissioning equipment after phase completion; and
  - Replant vegetation during decommissioning;
  - Finish external surfaces and built structures with low glare coatings and appropriate colours to reduce contrast with the qualities of the surrounding landscape. Maintain or refinish the external surfaces to preserve the effectiveness of the surface treatments.
  - Use directional lighting fixtures, and consideration of height of lighting, shielding and low lumen fixtures; and
  - Dismantle offshore and onshore facilities during decommissioning and replanting vegetation;
- Management Plans: Implementing management plans based on BMPs which include Construction Environmental Management Plan and Operations Environmental Management Plan and Decommissioning Environmental Management Plan to manage lighting.

No additional mitigation measures were proposed by TJLP as part of the BVSA.

8.3.3 POTENTIAL PROJECT EFFECTS AND PROPOSED MITIGATIONS IDENTIFIED DURING APPLICATION REVIEW

The following key issues related to the assessment of Visual Quality for TMJ were identified during Application review and based on feedback from the Working Group:

- Residential daytime and nighttime scenic quality of re-established lands; and
- Cumulative effects.

RESIDENTIAL DAYTIME AND NIGHTTIME SCENIC QUALITY OF RE-ESTABLISHED LANDS

Quw'utsun Nation member Indigenous Groups intend to re-establish lands for residential use in the location classified as VP2 (Dyke Road (area of a former Indigenous Village site). A concern was raised that their intention to re-establish the area with a residential function was not captured appropriately in the Visual Impact Rating or the Visual Quality Baseline. Cowichan Nation Alliance requested that TMJ provide a mitigation plan that considers the revised Visual Impact Rating from low to moderate for the VP2. Tsleil-Waututh Nation and Musqueam

Indian Band also expressed a concern on the effects to Indigenous communities in the LAA from changes to Visual Quality and the development of industrial marine activity.

> TJLP responded that the viewer characterization is based on current understanding and use, existing use and value viewers place on the viewpoint. TJLP also identified that that the level of visual impact may increase if permanent residences were located at VP2 as they would have increased visual exposure to TMJ than current users. TJLP considers that visual effects to future intended use would need specific and sufficient information relating to the use and development of the re-established site that identifies activities to assess viewer sensitivity. TJLP acknowledged that the landscape could change over time due to factors such as industrial development and this could have adverse effects to Indigenous Groups' use of lands and resources through changes to visual quality.

CUMULATIVE EFFECTS

Tsawwassen First Nation raised concerns about the EAO's reliance on the "existing visual landscape character" as part of the significance determination of residual effects, as rationale for additional industrial activity in an already saturated area on the basis that the area is currently being used for these purposes.

The EAO notes that the residual effects assessment evaluates the incremental effects of a project based on current conditions, including any available information on natural or human caused trends. The EAO does not conduct an assessment based on an historic baseline. Effects from past activities that affect the existing conditions are included in the context of the assessment of visual quality. Please refer to the Current Use for Lands and Resources for Traditional Purposes (Section 11.4) and Part C (Assessment of Rights) sections of this Report for the EAO's consideration of visual quality with respect to these assessments.

8.3.4 THE EAO'S ANALYSIS AND CONCLUSIONS

This section presents the EAO's conclusions on the potential adverse residual effects from TMJ on the Visual Quality VC. The EAO evaluated the potential effects to visual quality by considering construction, operations and decommissioning activities that could affect Visual Quality from increased visibility and lighting levels due to increased marine construction, marine vessel traffic, and vessel berthing, loading and departing.

Proposed Provincial Conditions: Based on mitigations proposed in the Application and issues raised during Application review, the EAO proposes the following provincial conditions, both of which would include lighting management components:

- Condition 10: Construction Environmental Management Plan; and
- Condition 11: Operations Environmental Management Plan.

Residual Effects: After considering the proposed mitigation measures, the EAO concludes that TMJ would result in the following residual adverse effects below to the Visual Quality VC during operations for the Application scenario and BVS:

- Increase in daytime visibility of TMJ's components at the TMJ site and marine vessel movements; and
- Increase in nighttime visibility of TMJ's lighting at the TMJ site required for safety and navigational lighting of vessels during operations.

The EAO's characterization of the expected residual effects of TMJ on Visual Quality during operations are summarized below in the table and reflect the EAO's level of confidence in the effects determination (including their likelihood and confidence).

Table 30: Summary of residual effects for daytime and nighttime viewing during Operations.

Criteria	Assessment Rating	Rationale
Context	All: Moderate Resilience	Landscape has a history of marine industrial use and is moderately resilient to visually absorb a degree of additional infrastructure development and related lighting sources without substantially altering its visual quality. MSA: TMJ would use established and existing marine shipping routes which have a history of marine industrial use. The seascape and international shipping routes are moderately resilient to visually absorb a degree of additional marine traffic without significantly altering its visual quality.
Magnitude	Daytime viewing: Negligible – Low Nighttime viewing: Negligible MSA: Negligible	Daytime viewing: TMJ components are predicted to be visible from all key viewpoints during operations, appearing as faint to prominent features from key viewpoint locations, but would represent a negligible to low visual effect to the existing visual landscape character. Nighttime viewing: A perceptible increase in nighttime lighting conditions is predicted as a result of operational and navigational lighting sources associated with TMJ. With the implementation of mitigation measures, the increase from baseline conditions is expected to be is negligible. MSA: TMJ-related marine traffic is predicted to be visible from all key viewpoints during operations, appearing as inconspicuous to obvious features on the seascape from all the viewpoint locations. Vessel movements would represent a generally small temporary visual change to the existing visual quality as vessel transit time from each of the viewpoints would range from 7 to 52 minutes, and residual effects are predicted to be negligible.
Extent	All: Local	Effects are expected to be discernable only in the Visual Quality LAA and MSA LAA.
Duration	All: Long-term	Residual effects on daytime and nighttime viewing are predicted to begin during construction and continue through operations.
Frequency	Frequent to Continuous	Residual effects on daytime and nighttime viewing are expected to remain continuously at the TMJ site for as long as TMJ is operational,

Criteria	Assessment Rating	Rationale
		and frequent for vessels transiting from the TMJ site to Sand Heads (on average, one vessel call to the jetty or two movements a day for the BVS). MSA - Frequent: Vessel transit time from each of the viewpoints would range from 7 to 52 minutes and would occur during five vessel movements per week.
Reversibility	All: Reversible	It is expected that visual quality would return to its existing conditions following the closure and decommissioning of TMJ.
Likelihood	There is a high likelihood of residual daytime and nighttime viewing visual effects as a result of TMJ.	
Confidence	The EAO's confidence in the effects assessment is high, based on the use of reliable data sources for visual effects assessment and best practices for mitigation measures. The EAO acknowledges that the level of visual impact may increase if permanent residences were located at VP2. The lighting design at the marine terminal area is based on established design criteria and regulatory requirements which the EAO is confident would minimize adverse lighting effects. The EAO is satisfied that the effectiveness of most mitigation measures is well known as they are based on established BMPs and established minimum lighting requirements for health and safety and marine navigation. International marine shipping is present along TMJ's marine shipping route. TMJ would comply with Maritime Regulations and Legislation including those required for navigational lighting. Based on regulatory requirements and proposed mitigation measures, the EAO is confident TMJ would minimize adverse visual effects. The EAO is satisfied that the effectiveness of the mitigation measures is well known as they are based on established Marine Regulations and Legislation for health and safety and marine navigation.	
Significance	In consideration of the conditions identified in the TOC the EAO concludes that TMJ would not have significant adverse residual effects on the Visual Quality VC.	

Note: Criteria and assessment ratings are defined in Appendix 5: Residual Effects Characterization Definitions.

8.3.5 CUMULATIVE EFFECTS ASSESSMENT

The Application considered past, present and reasonably foreseeable future projects in the cumulative effects assessment. Fraser Surrey Docks Direct Transfer Coal Facility, PBRP, RBT2, FortisBC's Tilbury Phase 1 LNG Expansion Project, the VAFFC, Fraser River Tunnel Project, the Vancouver Fraser Port Authority Habitat Enhancement Program, Seaspan Ferries Tilbury Terminal Expansion, TMX, and Deas Island BC Hydro Transmission Line were all considered in the cumulative effects assessment. The Application determined that these projects did not have any potential interaction with TMJ due to either the distance to TMJ or no spatial overlap of effects on noise.

The EAO has also considered the proposed Delta Grinding Facility on Tilbury Island and concluded that there would be no overlap between the construction phases of TMJ and this project as Delta Grinding is at an earlier phase in the EA process. Tilbury Phase 2 LNG Expansion Project was also considered in the cumulative effects assessment, which was not included in TJLP's Application. The EAO does not have specific predictions for the Tilbury Phase 2 LNG

Expansion Project; however, it is reasonable to assume that the projects could interact cumulatively if there is a temporal overlap with during construction. The EAO also notes that Tilbury Phase 2 LNG Expansion Project is subject to an EA and potential effects would be assessed in that EA process.

TJLP did not conduct a cumulative effects assessment on the residual effects from visual quality from vessels transiting the MSA LAA as it did not expect any measurable effects that would interact cumulatively with other projects. The EAO agrees with this conclusion.

The Application identified Delta Link Business Park and VAFFC to have the potential to act cumulatively with TMJ's residual effects for the Visual Quality VC.

The Delta Link Business Park involves 1.5 million square feet of industrial facilities located approximately 1.3 km upstream of TMJ. The lighting and visibility of the Delta Link Business Park-related infrastructure is expected to be negligible as landforms and vegetation fully or partially screen buildings and related lighting fixtures. Potential cumulative residual effects on visual quality to visibility and lighting are not expected to occur or be negligible as a result of the Delta Link Business Park and TMJ projects. Cumulative residual effects during operations has a high likelihood of occurring resulting from an increase in visibility and lighting from industrial infrastructure. The residual cumulative effects significance for visibility and lighting from industrial infrastructure is not predicted to be significant, as it is not expected to cause a noticeable and distinct change to daytime and/ or nighttime viewing that adversely, permanently, and irreversibly alters the existing visual character of the landscape.

The VAFFC project involves the construction of a marine terminal and fueling facility with barges delivering fuel once every two weeks and a Panamax class vessel once a month. It is expected to temporally overlap with TMJ, increasing lighting and visibility of construction materials and activities during construction and decommissioning; however, the cumulative residual effect's characterization for this project during construction and decommissioning was negligible and no cumulative residual effect is expected. Effects on visual quality are expected to increase during operations for the Application scenario and BVS. The Application characterized the VAFFC's cumulative residual effect during operations as having a moderate to low magnitude for visibility and lighting, respectively, as the visual quality is noticeable and distinct and not uncharacteristic of the existing character in the LAA. The EAO concludes that the duration and frequency of the visibility and lighting cumulative residual effect for the Application scenario and BVS is long-term to continuous and long-term to frequent that is reversible and moderately resilient.

8.3.6 CONCLUSIONS

Considering the above analysis and having regard to the mitigation measures identified in the TOC including Condition 10: Construction Environmental Management Plan and Condition 11: Operations Environmental Management Plan (which would become legally binding if an EAC is

issued), the EAO is satisfied that TMJ would not have significant adverse residual effects or cumulative effects on the Visual Quality VC.

8.4 ECONOMY

This chapter assesses the potential adverse effects to the Economy VC. The Economy VC included the following subcomponents:

- Labour market;
- Regional economic development; and
- Local government finances.

The Economy assessment informed the assessments of Socio-Community (Section 8.1), Effects on the Health and Socio-Economic Conditions of Indigenous Peoples Related to CEAA 2012 Section 5(1)I(i) (Section 11.3), Current Use (Section 11.4), and Aboriginal Interests in Part C of the EAO's Report. Refer to Part A (Section 2.3) of this Report, for a summary of estimated economic benefits of TMJ during construction, operations and decommissioning, as reported in the Application.

TJLP would hire locally for construction and operations. Housing and/ or accommodation for construction or operations is not included as part of TMJ, because TMJ is expected to draw on the local labour work force.

8.4.1 BACKGROUND

The economy of Metro Vancouver is considered mature and diversified with the third largest labour market in Canada and the largest in British Columba (B.C.)[118]. Recent years of economic growth in Metro Vancouver have resulted in a 'balanced labour market' in which unemployment hovers between 5 percent and 8 percent. Delta, where the TMJ would be located, has a level of economic diversity that is consistent with its neighbouring cities and includes key sectors such as construction, manufacturing, transportation and warehousing, science and technology, education, and healthcare. Delta's unemployment rate was 5.3 percent in 2016 with a slightly higher median income of $37,000 compared with Metro Vancouver's $33,000 median income.

In 2016, Indigenous workers accounted for 2.3 percent of the total labour force in Metro Vancouver. Unemployment rates for Indigenous people were 9.6 percent, which is approximately 3.8 percent higher than the region's overall rate.

[118] BC Ministry of Finance 2017 British Columbia Financial and Economic Review, 77th Edition, for April 2016 - March 2017. Available at: https://www2.gov.bc.ca/assets/gov/british-columbians-our-governments/government-finances/financial-economic-review/financial-economic-review-2017.pdf?bcgovtm=buffer.

The current B.C. economy is mature and diversified with growth in 2017 estimated between 3.1 percent and 3.5 percent. The Application noted this level of growth is anticipated to decline due to weakening in the residential real estate market; however, these declines would be tempered by consumer spending and slowly rising export growth, such that growth of between 2.3 percent to 2.5 percent is anticipated through 2020.

To promote economic development and support local business capabilities and capacity, Metro Vancouver and member municipalities have established economic commissions, economic development departments and agencies and other external groups such as regional boards of trade and tourism and chambers of commerce.

Municipal revenues to support business development initiatives, and for operating costs in general, are generated mainly through property taxes and sale of services/ utilities (levies and user fees for garbage, recycling, water and sewer).

BOUNDARIES

The LAA for the Labour Market and Regional Economic Development subcomponents includes the boundaries of Metro Vancouver, while the RAA and cumulative effects assessment areas for these subcomponents includes the Province of B.C. The LAA for Local Government Finances includes Metro Vancouver, with a focus on Delta, while the RAA and cumulative effects assessment areas for this subcomponent includes Metro Vancouver.

8.4.2 POTENTIAL PROJECT EFFECTS AND PROPOSED MITIGATIONS IN THE APPLICATION

Anticipated positive economic effects identified in the Application are summarized in Part A (Section 2.3) of this Report. The section below summarizes the potential economic effects, as reported in the Application.

LABOUR MARKET

TJLP assessed the labour market subcomponent through an evaluation of change in:

- Employment due to TMJ labour demand; and
- Employment income due to TMJ-associated hiring.

The Application noted that change in employment due to TMJ labour demand could result from direct employment, direct supplier employment, indirect employment, and induced employment during construction. The direct labour requirements for TMJ would be approximately 218 full time construction jobs over four years in the LAA (or 276 FTEs or 276 person years of employment). Direct employment was estimated to be highest (126 FTEs) in the first year of construction of the jetty and temporary bunker berth. According to the Application, TMJ would generate an additional 407 FTEs (or 366 jobs) through construction-

related direct supplier employment; 271 FTEs (or 271 jobs) through indirect construction-related employment; and 129 FTEs (or 142 jobs) through induced construction-related employment. TMJ would require seven FTEs throughout operations; however, these positions would be filled by existing employees at the Tilbury LNG Plant. As a result, TMJ would not create new direct employment opportunities during operations and therefore would not result in change in income.

The Application noted that change in employment due to TMJ labour demand for the general and Indigenous populations in the LAA would be a benefit to the community and adverse effects from TMJ employment on the local labour market were not anticipated.

The Application evaluated potential change in employment income due to TMJ-associated hiring, noting the positive effects of TMJ construction on employment income, in relation to expected annual average labour income is possible during construction only and that it would result in a benefit to the community and neighbouring communities. Adverse effects from TMJ employment income on the local labour market were not anticipated.

TJLP concluded that a change in labour market balance is not anticipated as there would be capacity in the local labour force to meet TMJ labour demand while maintaining a balanced rate of employment.

REGIONAL ECONOMIC DEVELOPMENT

The regional economic development subcomponent was assessed through changes in business opportunities during construction and operations due to:

- TMJ spending on materials, goods and services; and
- Household spending of TMJ-associated income.

The Application notes that TMJ-induced output in B.C. related to TMJ spending on materials, goods, and services is estimated to be $132.8 million during the four-year construction. Businesses in the LAA are expected to realize $122 million in direct and indirect revenues during construction. Qualifying Indigenous businesses would experience a beneficial effect due to TMJ spending during construction; however, the Application notes that historical, social, and systemic barriers could limit the realization of opportunities. TMJ-associated induced output in B.C. related to household spending of TMJ-associated income earned over the four-year construction is expected to be $24.2 million. Of which $15.5 million is expected to be generated in various businesses in the LAA, rooted in household spending of TMJ-associated direct and indirect employment and labour incomes. The industries that are likely to account for most of the induced output are finance, insurance, and real estate; retail trade; accommodation and food services; and manufacturing.

The Application notes that operations expenditures would range from $3.5 to $6.5 million annually during operations and would accrue to local and regional businesses in a similar

fashion as construction. Indigenous businesses, similar to during construction, could secure direct or indirect contracts that would benefit them. The Application noted that during operations, household spending of TMJ-associated income is predicted to flow to businesses located in the communities in the LAA, including Indigenous businesses. The location of consumer spending of wages and salaries related to TMJ would vary according to the permanent residence of direct and indirect employees and would be influenced by whether local businesses have capacity to meet the consumer spending objectives of direct employees and supplier industry (indirect) employees.

The Application noted that potential regional economic development effects would be beneficial during construction and operations and were not carried forward for assessment of potential adverse effects.

LOCAL GOVERNMENT FINANCES

TJLP assessed the potential effects to local government finances through change in:

- Local government taxation revenue due to payment of TMJ property taxes; and
- Taxation revenue due to TMJ-associated direct, indirect, and induced employment and procurement of goods and services.

The Application noted that direct TMJ effects on the economy are not expected to occur if taxation revenue due to TMJ are sufficient to address increased local government expenditures associated with TMJ's use of municipal services and infrastructure. TJLP estimated property tax and fee payments for building permits to be approximately $1.3 million to $1.7 million over the four-year construction, while annual fee payments during operations would range between $209,000 and $387,000. TJLP's assessment of changes in demand for municipal services and use of community infrastructure showed no change from current conditions; therefore, their analysis focused on the beneficial effects of increased taxation revenue.

The Application notes that municipal, provincial, and federal levels of government would benefit from increases in income, corporate, and product (for example, PST) tax revenue as a result of employment and procurement activities. Refer to Part A (Section 2.3) for a summary of local, provincial and federal tax revenues.

BUNKER VESSEL SCENARIO

In the BVSA, TJLP concluded that the increase in annual bunker vessel traffic would not interact with the Economy VC; therefore, did TJLP not conduct additional analysis.

8.4.3 MITIGATION MEASURES PROPOSED IN THE APPLICATION

The Application noted that, although TMJ is anticipated to have positive effects to the Economy VC, it is committed to instituting policies that support maximization of the anticipated

employment and taxation benefits. TJLP proposed a requirement for the TMJ contractor to have formal local and Indigenous hiring and procurement policies in place throughout construction, with annual reporting requirements, that would:

- Support Indigenous workers in accessing employment and contracting benefits associated with TMJ;
- Outline Indigenous employment and contract targets with key indicators to measure progress; and
- Describe annual reporting on the recruitment, retention, and uptake of local and Indigenous hires to determine success and address challenges. Annual reports would be reviewed by an independent third party to verify the results, monitor progress, and provide recommendations to support local and Indigenous employment.

Following the implementation of mitigation measures noted above, the Application stated that there would be negligible residual effects to the Economy VC.

8.4.4 POTENTIAL PROJECT EFFECTS AND PROPOSED MITIGATIONS IDENTIFIED DURING APPLICATION REVIEW

The following key issues related to the assessment of Economy for TMJ were identified during Application review and based on feedback from the Working Group.

During the Application review, Musqueam Indian Band noted that there was no socio-economic baseline information specific to Musqueam Indian Band or other Indigenous Groups used in the Application.

> TJLP responded that they prepared the assessment using information available to them, including Indigenous employment data from census data and information provided by each Indigenous Group. They remain open to receiving any additional information from groups and sought input in the development of the proposed employment and procurement plan.

Musqueam Indian Band and Tsleil-Waututh Nation requested further detail on the proposed local and Indigenous hiring and employment and procurement plan.

> TJLP responded that the proposed mitigation measures outlined in the Application, including requirements for the TMJ contractor to have formal local and Indigenous hiring and procurement policies in place throughout construction, would aim to maximize economic benefits to local and Indigenous communities, and that these policies would be developed in consultation with Indigenous Groups.

The EAO proposes Condition 16: Indigenous Training, Employment and Procurement Plan, developed in consultation with Indigenous Groups which would include measures to support the procurement of goods and services from businesses owned by Indigenous Groups and to

provide training opportunities for Indigenous monitors and enhance the hiring and retention of Indigenous Groups and their members. The EAO also proposes Condition 9: Indigenous Monitors and recommends a KMM under CEAA 2012 for Indigenous Monitors, to provide opportunities for the participation of Indigenous Groups in monitoring activities during construction and operations.

The EAO is of the view that the issues discussed are resolved for the purpose of the EA.

8.4.5 CONCLUSIONS

Considering the above analysis and the conditions identified in the CPD and TOC, including Condition 16: Indigenous Training, Employment and Procurement Plan and Condition 9: Indigenous Monitors (which would become legally binding if an EAC is issued), and recommended KMM under CEAA 2012, the EAO is satisfied that TMJ would have negligible adverse effects on the Economy VC.

9.0 ACCIDENTS AND MALFUNCTIONS

9.1 BACKGROUND

During Construction, Operations and Decommissioning TMJ, unplanned events associated with TMJ activities or environmental events or processes could arise resulting in potential effects to economic, environmental, health, heritage or social values.

TJLP used three types of models for the assessment: 1) a project risk matrix to assess effects to VCs which provide definitions of likelihood and consequence; 2) location specific individual risk (LSIR) to estimate risk to public safety using an approach that predicts individual risk; and 3) societal risk to estimate risk to public safety using an approach that predicts the risk of multiple fatalities which is suitable for highly populated urban areas. Each model is further described below.

Potential unplanned events were assessed in the Application using a risk-based approach, where the likelihood and consequences of an event informed the level of potential risk (see Figure 9-1, Risk Matrix). The possible scenarios were risk-ranked, ranging from low (green), moderate (yellow), high (orange), to highest (red), based on the combination of the likelihood of the scenario arising and the potential severity of its consequence. TJLP has noted that the risk matrix shown in Figure 17 is based on a commonly accepted approach rooted in professional judgement and used in the industry for project planning, including EAs, to evaluate the risk of potential serious or catastrophic incidents.

Public Safety – Individual Risk

In the Application and MSA, TJLP assessed the risk to public safety for LNG release scenarios at the jetty and from marine transit by evaluating the LSIR, which is the cumulative risk from all modelled scenarios to an individual at a specific location who remains there continuously. For both the jetty and marine transit, TJLP categorized location specific individual risk into three levels based on the likelihood of an individual fatality: Broadly Acceptable (less than once in 1,000,000 years), Tolerable if demonstrated measures are in place to reduce risks to "As Low As Reasonably Practicable" (ALARP; once in 10,000 to 1,000,000 years) and Intolerable (greater than once in 10,000 years). These criteria are consistent with Canadian standards[119] and British Columbia Oil and Gas Commission (BC OGC).[120] The Application explained that risks in the ALARP region should be supported by a demonstration that industry standard practices are in place to mitigate the risk. The predicted individual risk is cumulative of all public safety hazards associated with TMJ. Note that the above information and details of the risk criteria are only applicable to LSIR. For a discussion of the potential risks related to multiple fatalities ("societal risk") please see Section 9.3 below.

[119] Canadian Standards Association (CSA) CSA-Z276.

[120] TMJ did not go through a formal, federal *Technical Review Process of Marine Terminal Systems and Transshipment Sites* (TERMPOL) process, but the Application notes that the TERMPOL guidelines do provide risk criterion to evaluate risk results.

	CONSEQUENCE SEVERITY				
Category	**Very Low**	**Low**	**Moderate**	**High**	**Very High**
Environment [a]	Negligible, barely detectable effects	Local effects, reversible within 1 year	Regional effects, reversible within 10 years	Regional effects, reversible in more than 10 years	Irreversible regional effects
Public Safety	Medical treatment not required	Reversible disability or injury requiring hospitalization	Irreversible moderate disability to 1 or more people	Single fatality, single irreversible severe disability	Multiple fatalities, multiple irreversible severe health effects

Likelihood						
Index	**Events per Year**					
Probable	**>1**					
Likely	**1–1/10**					
Possible	**1/10–1/100**					
Unlikely	**1/100–1/1,000**					
Rare	**1/1,000–1/10,000**					
Very Rare	**1/10,000–1/100,000**					

a) The "Environment" consequence category includes potential effects on all environmental, economic, social and health effects valued components.

Risk Level	**Management Action**
Highest	Action required. More detailed risk analysis may be required.
High	Assess risk mitigation options and reduce risk before closure, where practical. Prioritize resources to manage these risks before Moderate or Low ranked risks. More detailed risk analysis may be required.
Moderate	Assess risk mitigation options and reduce risk before closure, where practical.
Low	Assess risk (and monitor).

Figure 17: Risk Matrix

Table 87 (Appendix 7) provides the residual effects of various accidents and malfunctions to VCs predicted by TJLP following implementation of the mitigation measures, considering the Application scenario and BVS.

TJLP considered the scenarios below in the Application and MSA (where indicated) as potential accidents or malfunctions that could occur during Construction, Operations and Decommissioning:

- Hazardous material spills (Section 9.2.1);
- Loss of LNG containment (Section 9.2.2);

- Fire or explosion (Section 9.2.3);
- Unplanned disturbance of ecologically sensitive areas by equipment operations (Section 9.2.4);
- Failure of sediment containment (Section 9.2.5); and
- Allision, grounding, or collision of vessels navigating to and from the TMJ and in the MSA (Section 9.2.6).

BUNKER VESSEL SCENARIO

In the BVSA, TJLP considered environmental effects, as represented by the VCs identified in the Application (see Table 38 in Appendix 7 of this Report), using the same methods as the Application (see above). TJLP considered risks to public safety in a comparative quantitative risk analysis, which compared the risks associated with operation of the TMJ and marine vessel incidents for the BVS and for the scenarios presented in the Application. The methods used by TJLP to assess the BVS on the risk of an accident or malfunction are largely consistent with the methods presented in the Application. However, the risk criteria have been updated by TJLP to incorporate comments received during the Application review and are consistent with the methods presented in this Report (see above).

Of the scenarios listed above, TJLP identified that marine vessel allision, grounding, or collision involving a TMJ-related vessel while docking or at-berth at the TMJ facility or during transit in the Fraser River could be affected by the change in bunker vessel traffic between the Application scenario and the BVS. See Section 9.2.7 for further details on the BVS assessment.

9.2 POTENTIAL PROJECT EFFECTS AND PROPOSED MITIGATIONS IN THE APPLICATION

9.2.1 HAZARDOUS MATERIAL SPILLS

Hazardous material spill scenarios described in the Application include spills on land and those affecting the estuarine environment in the Fraser River (vessel fuel and LNG spills are discussed in Section 9.2.6). The most likely spills onshore are small-scale releases from fuel or hydraulic line leaks or ruptures, or other accidents involving mobile equipment which can be quickly contained. Larger onshore spills occurring near the Fraser River may enter the estuarine environment, if containment on land does not take place. Hazardous material releases to the Fraser River may also occur from fuel or hydraulic line leaks or ruptures, or other accidents involving on-water equipment, such as dredging equipment, supply barges, or other marine vessels. Spills to water would be contained according to the Spill Contingency and Emergency Response Plans for the TMJ marine terminal area.

In addition to designing, operating, and managing TMJ to reduce the potential for hazardous material spills, TJLP identified mitigation measures in the Application to address spills including the following:

- Develop and implement Construction and Operations Environmental Management Plans that incorporate safe handling and storage procedures for hazardous materials and spill contingency measures according to requirements of the *Transportation of Dangerous Goods Act*;
- Use equipment in or adjacent to the waterbody that is clean and free of external grease, oil or other fluids of a hazardous nature;
- Store hazardous materials in containment designed according to the B.C. Fire Code and applicable material safety data sheet guidelines;
- Collect stormwater runoff in a drainage system developed as part of TMJ's environmental management plan for Construction and Operations;
- Marine vessels would adhere to Annex I of the International Convention for the Prevention of Pollution from Ships (Convention for Prevention of Marine Pollution [MARPOL] 73/78). This would include contractually requiring marine vessels only discharge bilge water at port for treatment or at sea following treatment through an oil-water separator, as per regulation; and
- Develop a Spill Contingency Plan as part of the TMJ Emergency Response Plan in the marine terminal area.

TJLP concluded that a hazardous material spill on land or affecting the estuarine environment is considered likely to occur; however, with the implementation of mitigation measures, the severity of effects would be low. As such, TJLP concluded that the risk to the environment to be moderate. TJLP concluded that no risk to public safety is anticipated.

9.2.2 LNG TRANSFER SYSTEM LOSS OF LNG CONTAINMENT

Potential loss of LNG containment along TMJ's LNG transfer system without ignition is considered in this section. During normal operations, LNG would be transferred by the system from the adjacent FortisBC Tilbury LNG storage tank to an LNG vessel and return boil-off gas (that is, LNG vapour) from the vessel to the storage tank. Loss of LNG from the transfer system due to leaks or ruptures could occur from the onshore portion of the transfer system or offshore portion.

As LNG is an extremely cold liquid that is much lighter than water, any liquid loss from the sealed and pressurized system would likely spread on the surface of water or land and rapidly or immediately change physical state and vapourize. TJLP would include mitigation measures to limit ignition sources. Ignition and associated mitigation measures are considered in Section 9.2.3 below. A potential LNG release to the water is not expected to result in toxic effects as LNG does not persist in the environment and is non-toxic to marine life. As such, no cleanup actions are anticipated to be necessary due to an LNG spill.

TJLP identified mitigation measures in the Application, including mitigation by design to reduce the likelihood and consequence severity if a loss of containment occurs, including the following:

- Design the LNG transfer system and spill prevention system according to Canadian

Standards Association (CSA) CSA-Z276, and include leak, flammable gas, and fire detection systems and an emergency shutdown and notification system;
- Use drainage and spill containment systems to limit the spread of potential LNG pool;
- Use drybreak couplings and powered emergency release couplings that would shut off LNG flow during disconnect from the vessel including any sudden disconnect;
- Use an emergency release system that would disconnect LNG transfer system from the vessel's manifold in cases of the ship moving in a way that threatens the structural integrity of the connected loading arms;
- Implement a Marine Safety Protocol for the purpose of public safety, including signage notifying of the presence of hazardous substances, communication of the presence of an LNG ship at the berth to other vessels, and varying levels of site-specific operational measures ranging from observing passing vessels, to announcing to the vessels that they are in the vicinity of LNG operation, to suspension of LNG loading operations.

With the implementation of mitigation measures, TJLP concluded that the risk of LNG containment loss, assuming no ignition, would be low for the environment given the low magnitude of the consequence and rare likelihood. TJLP concluded that an LNG release without ignition would not affect public safety because a Marine Safety Protocol around TMJ offshore facilities would be in effect during loading operations.

9.2.3 FIRE OR EXPLOSION

TJLP does not consider explosion of natural gas to be a credible scenario as the natural gas would only be in a confined environment as LNG. In an unconfined space, natural gas will not explode. Combustion of natural gas in an unconfined space would rapidly burn back to the source until the source was eliminated or the fire extinguished.

Fire was a primary risk concern because a fire could potentially ignite an LNG vapour should there be an LNG release to the environment. Fire originating from, or spreading to, the Tilbury LNG Plant is unlikely to affect TMJ or the Tilbury LNG Plant because of detection and shutdown systems at the plant, and active safety mechanisms such as check valves, and isolation valves along the LNG line connecting the two. A fire could start on an LNG vessel with various scenarios; however, several measures would be in place to control the fire and prevent the spread to the TMJ facilities.

In addition to constructing TMJ to applicable codes and standards and including design features to mitigate the risk of fire and loss of LNG containment, TJLP identified mitigation measures in the Application that would reduce the likelihood or consequence severity of a fire, including:

- Consider hazard distances when locating TMJ structures and equipment;
- Transfer LNG from the FortisBC Tilbury LNG facility storage tank to vessels under closed loading conditions using vessel vapour collection systems such that no flammable vapours would be emitted;
- Equip TMJ facilities, LNG vessels, and assist tugs with firefighting equipment;

- Implement a Marine Safety Protocol for the purpose of public safety, including signage notifying of the presence of hazardous substances, communication of the presence of an LNG ship at the berth to other vessels, and varying levels of site-specific operational measures ranging from observing passing vessels, to announcing to the vessels that they are in the vicinity of LNG operation, to suspension of LNG loading operations; and
- Develop emergency response plan for the marine terminal area[121].

It is TJLP's understanding that TJLP would be required to develop a Fire Safety Plan in consultation with Delta, should TMJ be approved.

TJLP concluded that the likelihood of fire or explosion due to ignition of an LNG spill at TMJ facilities or from fire originating from the Tilbury LNG Plant would be very rare. The LSIR for the cumulative risk of all modelled cases associated with cargo loading at the jetty, including the risk from ignition of an LNG spill, is one fatality every 10,000 to 100,000 years within an approximately 300-meter radius of the jetty. The area within a 750-meter radius of the jetty would be within the Tolerable if ALARP range (one fatality every 10,000 to 1,000,000 years). Beyond this area, the LSIR would be in the Broadly Acceptable range (one fatality in greater than 1,000,000 years). For a discussion of the potential risks related to multiple fatalities ("societal risk") please see Section 9.3 below. With the implementation of mitigation measures, TJLP concluded that the risk of environmental effects from a fire or explosion is low.

9.2.4 UNPLANNED DISTURBANCE OF ECOLOGICALLY SENSITIVE AREAS BY EQUIPMENT OPERATIONS

Unplanned disturbances of ecologically sensitive areas by equipment operations are more likely to occur during construction and decommissioning. Such disturbances could be caused by clearing or other human errors due to lack of awareness.

Without mitigation measures, unplanned disturbance of ecologically sensitive areas by equipment operations during construction or decommissioning could affect water quality, vegetation, wildlife and wildlife habitat, fish and fish habitat. In the Application, TJLP noted design and mitigation measures to prevent unplanned disturbances include:

- Conducting mandatory environmental training for contractors and operators including educating workers on the location of sensitive areas; and
- Identifying boundaries of sensitive areas at the TMJ site with highly visible materials.

Any unplanned disturbances would be revegetated and restored, in consultation with

[121] For further details, refer to the Tilbury Marine Jetty Emergency Response Framework, dated April 23, 2021 (https://www.projects.eao.gov.bc.ca/api/public/document/60a562067429e10022397823/download/20210423_TilburyMarineJetty_EmergencyResponseFramework.pdf).

applicable regulatory agencies.

With the implementation of mitigation measures, TJLP concluded that the risk from an unplanned disturbance of ecologically sensitive areas would be low.

9.2.5 FAILURE OF SEDIMENT CONTAINMENT

Erosion and sediment release for the onshore portion of the TMJ site would be controlled by a stormwater drainage system. Failure of the containment could be caused by inadequate discharge of sediment-laden water into the aquatic environment during all TMJ phases. Without mitigation measures, sediment containment failure could affect water quality, vegetation, wildlife and wildlife habitat, fish and fish habitat. As outlined in the Application, TJLP's Environmental Management Plan would address erosion and sediment control, including: having the drainage system be designed by a QP; requiring that a construction quality control process is in place; installing measures to control erosion of exposed soils; and designing and installing physical controls such as sediment fencing.

With the implementation of mitigation measures, the magnitude of increased sedimentation is low, as the extent is expected to be local, short-term and reversible with restoration. TJLP concluded that there is no residual risk to public safety.

9.2.6 ALLISION, GROUNDING, OR COLLISION OF VESSELS

Allision (that is, a vessel striking a stationary structure), grounding, or collision could occur during Construction and Operations. Such incidents could result from human error, mechanical malfunction, or coincidental timing. An allision, or vessel strike, by either the LNG vessel or a passing vessel against the jetty or against a stationary LNG vessel at berth could also damage the LNG transfer system and cause an offshore release, which is assessed in Section 9.2.2 (LNG Transfer System Loss of LNG Containment without ignition) and Section 9.2.3 (Fire or Explosion).

Allision: Potential allision could occur between a TMJ-related vessel striking the TMJ facility during berthing and unberthing manoeuvres. Allision would be at slow speed during berthing and unberthing and low impact. Under these conditions, TJLP reports that the vessel's fuel or LNG containment tank would not be damaged, and thus would not affect the environment or public safety. Similarly, a low-impact vessel-to-vessel allision involving a berthing/ unberthing bunker vessel and a stationary LNG vessel (or vice versa) would not result in a loss of containment from the vessels. However, a low-impact allision could lead to damage to TMJ's Offshore Facilities, including the LNG line and loading arm. Damage to the LNG line or loading arm (leak or rupture) could lead to the loss of LNG containment and potential fire at the TMJ facility, which is addressed in Section 9.2.2 and Section 9.2.3. Potential allision could also occur between a passing vessel either striking the jetty or a TMJ-related vessel at berth, which has been considered in the LSIR for all modelled risk cases associated with cargo loading at the jetty (see risk LSIR information presented in Section 9.2.3 above).

Grounding: Potential grounding of a vessel (that is, vessel striking sea- or river-bed) could occur as a TMJ-related vessel transits through the Fraser River, Haro Strait, Boundary Pass, and Juan de Fuca Strait. TJLP reports that grounding could result in damage to the ship hull, but that not all grounding events would have sufficient energy to lead to the loss of containment. A drift grounding incident (i.e., in the event of a vessel losing power or steering failure) would have a low-energy impact, whereas a powered grounding would have a greater potential to cause substantial damage to a vessel. Presence of rocky sediment substrate where grounding occurs is the primary factor that influences the risk of a loss of containment. TJLP reported the probability for encountering a rocky shoreline in the Fraser River as being less than 10%, reducing the likelihood for a grounding event that would result in loss of containment.

Collision: Potential collision (that is, strike involving two moving vessels or object) could include a TMJ-related vessel and another vessel. A collision could occur due to mechanical issues or navigational errors, especially in the presence of extreme environmental events such as strong wind and wave conditions and low visibility. A collision could penetrate the fuel containment tank (for any vessel) or the LNG containment tank (for an LNG vessel), resulting in fuel or LNG release. A collision with a small vessel (e.g., used for traditional or recreational purposes) could result in damage to the vessel, property, or gear, or injury or fatality. The MSA noted that collisions with smaller vessels could also have effects to commercial marine use and current use of lands and resources for traditional purposes, the extent of which would be dependant on factors such as the degree of damage to the vessel. TJLP reported that the potential likelihood for injury or fatality in the event of collisions with smaller vessels is very rare.

TJLP reported that, while groundings and collisions involving LNG vessels have never resulted in penetration of the double-hull containment, a high-impact collision with sufficient energy could result in the release of LNG above the waterline. In the event of an LNG release, the outflowing LNG above the waterline could ignite due to friction, heat, and sparks from the tearing steel of the vessels involved, creating a localized pool fire. As the gas combusts, the pool would shrink until the LNG is depleted. A flash fire due to delayed ignition is also possible.

Bunker fuel release: Similar to grounding, a collision could penetrate the fuel containment tank of vessels involved in the collision. TJLP reported that most TMJ-related vessels would use LNG for fuel, but bunker fuel release in a collision involving an LNG-powered vessel could occur from the damage to the other vessel in the event of a collision. TJLP noted that the majority of LNG vessels expected at the TMJ site only carry a small volume of bunker fuel and use it as the pilot fuel, with LNG used as the primary fuel. As there is a reduced volume of bunker fuel carried on these vessels there is a corresponding reduction in risk of release. In the event of a bunker fuel release, only limited evaporation would occur, thereby requiring additional mitigation measures such as containment or recovery. According to the Application, the frequency of bunker fuel release from grounding of a TMJ-related vessel (considering the presence of rock substrate in some of the water bodies) or damage of the other vessel in a collision is very rare.

TJLP identified the following mitigation measures in the Application and MSA related to an allision, grounding and collision:

- LNG transport vessels will be required to conform with applicable codes and standards for vessel design, construction, LNG storage, and transport, including *Canada Shipping Act, 2001* and associated regulations, MARPOL, and the International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC) under Safety of Life at Sea (SOLAS);
- Safe navigation by:
    - Navigation in the Fraser River by experienced master mariner (captain) and a Fraser River pilot;
    - Port of Vancouver Traffic Control requirements (TCZ-4);
    - Navigation through Haro Strait and Boundary Pass and Strait of Georgia by B.C. Coast Pilot; and
    - Tethered tug escorts for Haro Strait, Boundary Pass, and Fraser River transit and berthing operations; tethered escort tugs required for LNG export vessels.
- Implement a Marine Safety Protocol for the purpose of public safety, including signage notifying of the presence of hazardous substances, communication of the presence of an LNG ship at the berth to other vessels, and varying levels of site-specific operational measures ranging from observing passing vessels, to announcing to the vessels that they are in the vicinity of LNG operation, to suspension of LNG loading operations;
- Install berthing aid systems including obstruction marking, radar reflectors and lighting to indicate the presence of obstructions of interest to the LNG vessel and pilots;
- Install environmental monitoring systems to measure wind, currents, waves and other factors;
- Develop emergency response plan for the marine terminal area;
- Cooperate in the development of emergency response plans with the CCG and TC for marine shipping;
- Mechanical recovery and shoreline protection for bunker fuel; and
- Communication equipment and established communication procedures in the Fraser River, and loudhailers (e.g., megaphone) to communicate with small vessels if necessary.

Risk to public safety: Based on a quantitative risk analysis, TJLP reported that the potential release of LNG as a result of grounding of TMJ-related vessel or collision between vessels is rare. The likelihood of an individual public fatality due to an LNG fire is very rare or less, depending on the location of the spill and whether public is present. TJLP estimated the LSIR from all modelled risk scenarios for marine transit in the waters and along the shorelines of the Fraser River, and along the shorelines near Port Renfrew and parts of Haro Strait and the Boundary Pass to be within the Tolerable if ALARP range (see figures 8-2 and 8-3 in Appendix 1.0-1 of the Application). Away from the shorelines of the Fraser River and along most of the marine shipping route, the individual risk of fatality is in the Broadly Acceptable range.

Risk to marine use and current use: The highest risks from allision, grounding or collision, are located within the Haro Strait along the shorelines of Discovery Island and southeast of Sidney Island and the Fraser River. The MSA concluded that the likelihood for a collision with a small vessel would be rare and the overall risk to marine use and current use of land and resources

for traditional purposes would be moderate.

Risk to environment: TJLP concluded that the residual risk from allision, grounding, or collision to the environment would be low to moderate, given the rare to very rare likelihood of the event but moderate to high consequence severity to the environment. The MSA assessed that the residual risk of an LNG release causing SRKW fatality or irreversible damage to heritage resources would be moderate, given the extremely rare likelihood but very high severity of consequences if it were to occur.

9.2.7 BUNKER VESSEL SCENARIO

TJLP stated that the risk of a loss of LNG containment during loading operations for the BVS is similar to that assessed in the Application and that the largest contributor to the risk is the potential allision involving a passing third-party vessel striking the TMJ facility. For the BVS, TJLP conducted a comparative quantitative risk assessment, focused on the risk of LNG release due to marine vessel allision, grounding, and collision. TJLP concluded that the while the likelihood of a loss of containment (i.e., LNG cargo release) from an LNG vessel is higher for the BVS, the higher likelihood is driven by the potential smaller releases (i.e., higher likelihood of lower consequence events). With the increase in bunker vessel traffic, there is an increased likelihood of releases from the smaller 7,500 m^3 LNG bunker vessels (maximum cargo tank size of 3,400 m^3). However, the BVS also involves a reduction in LNG carriers, which reduces the likelihood of a release from the larger 100,000 m^3 LNG carriers (maximum cargo tank size of 29,000 m^3). Overall based on the quantitative risk assessment modeling results, TJLP concluded that the risk to the VCs for the BVS would remain moderate.

In terms of a bunker fuel release (as described in Section 9.2.6 above), TJLP stated that a TMJ-related marine vessel incident could also result in the release of bunker fuel. Noting that the risk of TMJ-related bunker fuel release is driven primarily by potential accidents involving bunker-fuel-powered construction vessels, supply vessels, or a third-party vessel involved in a collision with a TMJ-related vessel. TJLP stated that TMJ-related LNG vessels are expected to be predominantly LNG-powered. Further, the number of diesel-powered tugs would be reduced for the BVS. TJLP concluded that the change in bunker vessel traffic would have negligible effect on the risk of a TMJ-related marine vessel incident resulting in bunker-fuel release assessed in the Application.

For public safety, TJLP concluded that the LSIR for both the public areas around the TMJ site and along the Fraser River shipping route would remain within Broadly Acceptable and Tolerable if ALARP with the BVS. The societal risk, accounting for potential of multiple fatalities, TJLP concluded that the risk also remains within Broadly Acceptable and Tolerable if ALARP with the BVS. Refer to Appendix G of TJLP's BVSA for more details on the risk analysis.

9.3 POTENTIAL PROJECT EFFECTS AND PROPOSED MITIGATIONS IDENTIFIED DURING APPLICATION REVIEW

The following key issues related to the assessment of Accidents and Malfunctions for TMJ were identified during Application review and based on feedback from the Working Group:

- Societal risk assessment and data interpretation;
- Marine Safety Protocol;
- Emergency response;
- Potential effects from spills and spill response;
- Compensation for spill damage; and
- Bunker Vessel Scenario.

SOCIETAL RISK ASSESSMENT AND DATA INTERPRETATION

During Application Review, the BC OGC and Cowichan Nation Alliance and provided comments related to the risk assessment in the Fraser River and the interpretation of the data provided in the Navigation Study (Risk Assessment – Appendix 1.0-1 of the Application). The BC OGC requested that the navigation segments and the terminal risk be assessed against a set of comprehensive risk criteria, including a multiple fatality scenario for public safety at the TMJ site and along the Fraser River given the location and number of people in regular proximity to TMJ. The Cowichan Nation Alliance provided comments on the Navigational Study, in particular, requesting more details for the consequences analysis that was performed for each of the LNG release scenarios and maps to show the potentially affected areas.

Over the course of the EA a variety of memos and technical information was exchanged on the topic of societal risk[122] and navigational safety, including analyses by TJLP[123] and reviews by BC

[122] Societal risk is the collective risk to all exposed individuals which is presented as an "FN curve" to show the relationship between the cumulative frequency of risk events (F) versus the number of human fatalities (N).

[123] TJLP TERMPOL Societal Risk Memo dated November 28, 2019 (https://www.projects.eao.gov.bc.ca/api/public/document/60a493aa93b50500223b90c6/download/20191128_CNA_TERMPOL%20Societal%20Risk.pdf); TJLP Public Safety Risk memo, dated November 20, 2020 (https://www.projects.eao.gov.bc.ca/api/public/document/60a558d2148b4a0023306fff/download/20201020_Attachment%20A%20-%20DNV-GL%20Response%20to%20EAO%20IR_R2.pdf); TJLP response to BC OGC comments, dated December 17, 2020 (https://www.projects.eao.gov.bc.ca/api/public/document/60a561a47429e10022397818/download/20201217_EAC_OGC-55.pdf); TJLP memo response to BC OGC comments, dated November 30, 2020 (https://www.projects.eao.gov.bc.ca/api/public/document/60a560c77429e100223977dd/download/20201130_OGC-51_54_56.pdf); and TJLP memo response to VFPA comments, dated October 9, 2020 (https://www.projects.eao.gov.bc.ca/api/public/document/60a55f3c7429e100223977bb/download/20201020_Attachment%20E%20-%20Lantec%20Marine%20Response%20to%20VFPA%20IR.pdf).

OGC[124]. TJLP's documents evaluated societal risk from operations at the jetty and marine transit and included information on marine simulations relevant to navigational safety of TMJ-related vessels. TJLP also provided additional consequence analysis that showed the maximum consequence distance that a hazard could extend following the release of LNG.

The BC OGC has specific risk criteria for societal risks to people "offsite" of an LNG facility. The societal risk criteria (i.e., Broadly acceptable, Tolerable if ALARP and Intolerable) are dependent on both the cumulative frequency of an event and the number of fatalities. The OGC criteria would apply to the cargo loading component of TMJ at the jetty. TC and VFPA clarified that neither party has quantitative risk criteria they use to consider risk tolerability for marine navigation. TJLP used UK Health and Safety Executive (HSE) criteria for the societal risk marine transit assessment based on professional opinion. The TMJ risk matrix (Figure 17) should not be used to interpret the societal risk results because the risk matrix considers individual events while the societal risk method considers all (cumulative) TMJ risk events[125].

Marine Transit: TJLP's societal risk memo[126] included societal risk (FN curve) estimates for the marine navigation. The analysis showed that that highest marine transit risk would be in the Tolerable if ALARP range adopted by the UK HSE. Within this range, it showed a likelihood of up to approximately 10 fatalities once in approximately 7,000 to 10,000 years for all vessel types along the entire shipping route and a lower likelihood for higher than 10 fatalities (see Figure 5.1 in TJLP's societal risk memo). The analysis also demonstrated that of all the vessel types and portions of the shipping route assessed, the highest risk was for LNG carriers transiting in the lower Fraser River. This scenario considers a low probability event where up to 500 fatalities occur, which is in the Tolerable if ALARP range (i.e., likelihood of up to 500 fatalities less than once in 1,000,000 years, see Figure 5.2 in TJLP's societal risk memo). The risk for LNG carriers in the lower Fraser River is driven mostly by grounding (for details on grounding please see Section 9.2.6 above). TC noted that the assessment of probability and proposed mitigation measures in the Application and supplemental information appeared reasonable, considering the redundant layers of safety that make up Canada's marine safety system. In response to VFPA's questions, TJLP provided additional information regarding the navigational safety of TMJ-related vessels and supplementary information on marine simulation in supplemental

[124] BC OGC's letter and BakerRisk Engineering and Risk Consultants' WesPac Tilbury LNG Termpol Review Memo, dated June 24, 2020 (https://nrm.sp.gov.bc.ca/sites/EAO/project435/Shared%20Documents/Application%20Review/WG_Comments/OGC_20200828_BakerRiskMemo_OGC-CoverLetter.pdf)

[125] TJLP explained that the societal risk assessment FN curve can be directly compared to the criteria FN curve adopted by BC OGC for the marine terminal area and the FN curve adopted by the UK HSE may be used for comparison purposes for shipping aspects of the marine transit risk.

[126] TJLP TERMPOL Societal Risk memo dated November 28, 2019 (https://www.projects.eao.gov.bc.ca/api/public/document/60a493aa93b50500223b90c6/download/20191128_CNA_TERMPOL%20Societal%20Risk.pdf);

memos[127]. VFPA reviewed the responses and materials provided by TJLP and found them satisfactory for the EA.

Cargo loading at the jetty: The various risk analyses showed that the "off-site" societal risk is dominated by a passing vessel striking the jetty structure and/ or striking the LNG carrier berthed at the jetty. TJLP's updated societal risk memo[128] presented a model which used population data that was more reflective of the worker and residential population density in the vicinity of TMJ compared to previous analyses in the EA. The memo also identified several potential additional mitigation measures each with a technical rationale, pros and cons. The use of more realistic population data inputs resulted in an offsite societal risk for the TMJ cargo loading operation (including a berthed LNG vessel) for which the highest risk would be considered Tolerable if ALARP. Within the Tolerable if ALARP range, it showed a likelihood of one fatality less than once in 100,000 years and a lower likelihood for more than one fatality. When only loading and standby scenarios are considered, the societal risk falls within BC OGC's Broadly Acceptable societal risk criteria.

Maximum consequence analysis: TJLP's submitted memos[129] describing maximum consequence distances[130] for worst-case scenarios. For a scenario of a full LNG transfer system rupture during LNG loading, the maximum consequence distance from the jetty for a fire/ radiation is 520 m and for a flammable dispersion (i.e., flammable vapour cloud) is 1,502 m. TJLP concluded that few events have consequences that could reach substantial distances, such as the modeled

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[127] TJLP response to EAO Information Requests related to Societal Risk, dated October 14, 2020 (https://www.projects.eao.gov.bc.ca/api/public/document/60a5601f7429e100223977ce/download/20201020_Tilbury%20Jetty%20Limited%20Partnership_TerminalRisk_EAO-IR%20Response%20EAO-02%2C%20EAO-03%2C%20EAO-04%20and%20VFPA-10.pdf); and Attachment A: (https://www.projects.eao.gov.bc.ca/api/public/document/60a558d2148b4a0023306fff/download/20201020_Attachment%20A%20-%20DNV-GL%20Response%20to%20EAO%20IR_R2.pdf); Attachment B: (https://www.projects.eao.gov.bc.ca/api/public/document/60a559417429e1002239774b/download/20201020_Attachment%20B%20-%20DNV-GL%20Tilbury%20LNG%20Loading%20Update%20Memo_R2.pdf); Attachment C: (https://www.projects.eao.gov.bc.ca/api/public/document/60a55aa47429e1002239775a/download/20201020_Attachment%20C%20-%20Quest%20Consultants%20DNV%20Risk%20Model%20Review.pdf); Attachment D: (https://www.projects.eao.gov.bc.ca/api/public/document/60a55e157429e10022397796/download/20201020_Attachment%20D%20-%20Ausenco%20possible%20mitigations%20table.pdf); and Attachment E: (https://www.projects.eao.gov.bc.ca/api/public/document/60a55f3c7429e100223977bb/download/20201020_Attachment%20E%20-%20Lantec%20Marine%20Response%20to%20VFPA%20IR.pdf).

[128] Attachment A to TJLP response to EAO, dated October 20, 2020 (https://www.projects.eao.gov.bc.ca/api/public/document/60a558d2148b4a0023306fff/download/20201020_Attachment%20A%20-%20DNV-GL%20Response%20to%20EAO%20IR_R2.pdf);

[129] TJLP's Response to OGC Comments, dated November 30, 2020 (https://www.projects.eao.gov.bc.ca/api/public/document/60a560c77429e100223977dd/download/20201130_OGC-51_54_56.pdf) and December 17, 2020 (https://www.projects.eao.gov.bc.ca/api/public/document/60a561a47429e10022397818/download/20201217_EAC_OGC-55.pdf)

[130] TJLP noted that the maximum distances indicate the farthest point that the hazard zone extends at any time while a release of LNG is occurring; however, the actual flammable volume that reaches this distance may be very low. Similarly, for radiation zones the area covered by the hazard zone at the greatest distance may be small in comparison to the rest of the hazard zone.

scenario of flammable dispersion of approximately 2,717 m from a passing vessel striking a LNG carrier loading at the jetty resulting in a loss of LNG containment. TJLP noted that worst-case consequences are usually associated with a large release size from a vessel, calm winds, and no ignition of the cloud until it is as far from the source as a flammable cloud can disperse while remaining in the flammable range. These worst-case scenarios were included in both the LSIR and societal risk assessments, where the risk of fatality is less than once in 100,000 years.

TJLP modeled maximum consequence results for collision and grounding scenarios for LNG carriers and bunker vessels in transit, also summarized in the memo response to OGC comments. For an LNG carrier, the maximum consequence distance for a collision or grounding is 572 m for a fire and 2,717 m for a flammable dispersion. For a bunker vessel, the maximum consequence distance for a collision or grounding is 440 for a fire, and 694 m for a flammable dispersion.

In terms of cargo loading operations at the jetty, the EAO has considered that the highest predicted societal risk levels are in the Tolerable if ALRAP range using the OGC criteria. Public safety risk would be discussed further following additional analysis and review of potential mitigations during the OGC permitting process (should an EAC be issued). In terms of marine navigation, the EAO engaged with parties that have expertise and jurisdiction in navigation and safety. TC noted that the risk assessment was conducted using international best practices, and the proposed mitigation measures appeared reasonable, considering the redundant layers of safety that make up Canada's marine safety system. The EAO is satisfied with the information provided for the purposes of the EA for both the Application scenario and BVS.

The EAO understands it is important to understand the scale of maximum consequences to appropriately plan for emergency response. The EAO is recommending KMMs under CEAA 2012 for an Emergency Response Plan and Marine Shipping Emergency Response Outreach Program. The Emergency Response Plan, in the marine terminal area, would describe potential accidents and malfunctions, operating procedures to prevent them and the measures to mitigate adverse effects. The plan would outline, emergency response training TJLP would provide for their personnel, and integrated response planning between TJLP and government agencies, local government, and emergency response departments. Spill response, including the implementation of exercises in cooperation with relevant authorities, and incorporation of learnings from the exercises into the plan. The Marine Shipping Emergency Response Outreach Program must identify the equipment that TJLP could provide to assist with marine shipping spill or emergency response associated with TMJ-related vessels, delivery or arrangement by TJLP for LNG safety related courses for CCG, Indigenous Groups, government personnel, industry sector, and community responders, and participation in CCG marine shipping incident response coordination and exercises.

MARINE SAFETY PROTOCOL

In the Application, TJLP proposed a marine safety exclusion zone or marine security zone in the

area of elevated public risk[131], that would be approximately 20 ha in size and extend up to 300 m from the jetty structure to maintain public safety and protect the security of TMJ operations. The zone was proposed to be enforced during berthing, de-berthing and LNG loading operations, during which time only TMJ-related and authorized vessel traffic would be permitted to enter the zone. During Application Review, TC and VFPA raised concerns about potential effects of the proposed zone to navigation and OGC, TC and VFPA requested additional details on TJLP's proposed safety protocols during LNG carrier transit, berthing, and loading of LNG.

In response to concerns raised about navigability, TJLP proposed a revised, protocol-based approach to provide for public safety and reduce the potential for interference with navigation adjacent to the TMJ site during Operations, and no longer proposed a spatially defined zone. TJLP has proposed a Marine Safety Protocol to come into effect during Construction (once the FTBB is in operation) and remain in place for the life of TMJ for the purpose of public safety. TJLP's Marine Safety Protocol includes proactive information sharing with mariners, notification to mariners and safety protocols that are consistent with industry standards and best practices. TJLP would post signage along the jetty notifying river users of the presence of hazardous substances and to exercise caution in the vicinity of the TMJ site. TJLP would work with the VFPA, the Pacific Pilotage Authority, and the Marine Communications and Traffic Services (MCTS) (a division of the CCG) to communicate the arrival/ departure times and presence of an LNG vessel at the TMJ for the information of other vessels on the river. TJLP proposed varying levels of site-specific operational measures to implement. Measures range from observing passing vessels, to announcing to the vessels that they are in the vicinity of LNG operation, to suspension of TJLP's LNG loading operations.

Upon review of the proposed Marine Safety Protocol, the OGC, TC, and VFPA were satisfied with the operational protocols to reduce public safety risk, and that the proposed protocols would not obstruct navigation and were consistent with applicable laws and regulations. The EAO understands that public safety risk and mitigation would be discussed further during the OGC permitting process, should TMJ receive an EAC. The EAO recommends a KMM under CEAA 2012 for a Marine Access and Transportation Plan that requires TMJ to identify marine uses and navigation in the TMJ area, and methods to coordinate activities and communicate with other marine users and regulators. As part of the Marine Access and Transportation Plan, TJLP would be required to develop marine safety protocol(s) and their implementation procedures to maintain navigation and safety, and describe procedures, safety training for Indigenous Groups and other measures to address the safety of marine users, fishers and construction personnel and to minimize the likelihood of vessel collisions during construction and operations.

[131] The area of elevated public risk is in reference to the Location-Specific Individual Risk (LSIR) contour of 1×10^{-5} fatalities/ year, as calculated by TJLP. This area is approximately 20 ha in size and extends approximately 300 m from the jetty structure, south of the outer limit of the navigation channel. In addition to a portion of the Fraser River, the area of elevated public risk includes a section of the onshore TMJ site and a portion of the onshore neighbouring facility to the south of the jetty.

EMERGENCY RESPONSE

During Application Review, many Working Group members raised questions about emergency response and sought clarification from the EAO, including Maa-nulth Treaty Society, Malahat Nation, Tsleil-Waututh Nation, the BC OGC and Delta. Questions were raised about how a spill response would be coordinated, whether the CCG has the capacity and training to respond to an LNG spill, and further details were requested to clarify specific responsibilities and capabilities of the CCG with respect to an LNG spill. The EAO worked with various agencies and TJLP to better clarify the process for Working Group members.

In response to questions raised during the EA, TJLP prepared an Emergency Response Framework[132] that describes key agencies and organizations that would be involved in emergency response planning, response preparedness, and fundamental response actions and activities in the event of an incident related to the operation of the jetty or to the operation of an LNG vessel during transit. The Emergency Response Framework was shared with the Working Group during Application Review.

In the event of an incident on water, CCG forms the "unified command" (i.e., organizes the different agencies and establishes priorities) and CCG pollution response personnel would conduct an assessment of what is the threat (type, quantity, discharge) and risk (what is being damaged – wildlife, water, cultural) and if required, set up incident command post (to address any long term effects and mitigation measures). Post-incident recovery efforts would likely involve ECCC and other partners, including CCG.

Initial Response measures would depend on Standard Operating Procedures of facility or ship that have details on initial strategies to manage a spill. It is the responsibility of the polluter to report and address marine pollution incidents, it is CCG's mandate to ensure an appropriate response. The ship operator/ owner ultimately is responsible for having (or contracting) the correct equipment and personnel to manage an accident involving a vessel. Ship employees may manage initial response, if needed specialist teams (e.g., Western Canada Marine Response Corporation) or other contractors may be brought in to assist with mitigation measures. The role of Western Canada Spill Response is to respond to the unlikely event of a bunker oil-related spill.

CCG has developed and maintains a Greater Vancouver Integrated Response Plan (GVIRP) for marine incidents which provides the structure within which it and other agencies coordinate their response to a marine pollution or spill incident. GVIRP is the overarching framework for marine pollution incident response, including the TMJ site and a portion of the MSA. If there was a vessel incident, coordination of federal, provincial, and municipal emergency management partners would ensue. Presently, LNG fire response is not considered in the

[132] TJLP Tilbury Marine Jetty Emergency Response Framework, dated April 23, 2021 (https://www.projects.eao.gov.bc.ca/api/public/document/60a562067429e10022397823/download/20210423_TilburyMarineJetty_EmergencyResponseFramework.pdf).

GVIRP. Spill response is outward to 200 nm – includes all Canadian waters, where the *Canada Shipping Act, 2001* applies. There is a cross-border spill plan (CANUSPAC) with the USA that would apply to LNG carriers. CANUSPAC is a regional bilateral plan with the US Coast Guard that covers pollution response in transboundary waters. It is not specific to LNG response but would apply if Canada requires assistance in a response.

The EAO recommends a condition for emergency response and spill prevention in the marine terminal area as part of the Construction and Operational Environmental Management Plans. The plans would include the emergency response and spill prevention mitigation measures that would be implemented if a spill (as defined by the BC *Environmental Management Act*) occurs, and procedures to notify Indigenous Groups, City of Delta, Metro Vancouver, and the City of Richmond of emergencies or spills. The EAO also recommends a KMM under CEAA 2012 for an Emergency Response Plan in the marine terminal area. The Emergency Response Plan would describe integrated response planning in the marine terminal area, including roles and responsibilities, and equipment requirements, between TJLP and government agencies/ local government/ emergency response departments. In terms of the marine transit area, once vessels leave the jetty, they are no longer within the care and control of TJLP. There are separate regulations placed on vessels requiring vessel operators to have their own emergency response plans, as discussed above. As such, the EAO recommends a KMM under CEAA 2012 for a Marine Shipping Emergency Response Program requiring TJLP to identify equipment that TJLP could provide to assist with a spill or emergency response associated with LNG vessels that have called on the jetty, and to facilitate the integration of plans for responding to incidents in transit into existing emergency response systems, primarily the CCG's Incident Integrated Response Plans.

POTENTIAL EFFECTS FROM SPILLS AND SPILL RESPONSE

Musqueam Indian Band raised concern that the accidents and malfunctions assessment included only one potential failure mode that could lead to effects on Current Use; thereby not accounting for other potential effects. These potential effects could include adverse "place-based stigma", contamination concerns, as well as navigation constraints and exclusion zones as response to unanticipated product releases. Tsawwassen First Nation indicated to the EAO that a grounding or collision event resulting in an LNG spill would be potentially devastating to Tsawwassen First Nation and would likely affect use and harvesting in their traditional territories.

TJLP responded that the only risk scenario that might affect areas beyond the immediate vicinity of the TMJ site (and thereby Current Use) would be the release of bunker fuel or LNG due to marine vessel grounding or collision. TJLP explained that the spill of oil or LNG could result in navigation and fishing restrictions which were considered in the accidents and malfunctions risk assessment.

ECCC requested clarification regarding the effects of LNG spills on colonial nesting marine birds. In particular, the effects of spills during breeding season.

TJLP agreed that there would be an increased risk to marine birds during nesting season although the risk for potential spills would be significantly reduced due to many of the mitigation measures that would be put in place. Should LNG be released into the water, it is not expected that the LNG spill would extend into the terrestrial environment (where nests may be located). In the worst-case scenario, select species could be affected by the LNG spill.

Tsawwassen First Nation raised concerns regarding the time period that potential effects of bunker fuel spills would be fully reversible for all fish and fish habitats.

With respect to effects on fish, TJLP noted that species that access the surface to breathe (e.g., marine mammals and marine birds) are more vulnerable to bunker fuel exposure than pelagic fish which are expected to have minimal interaction with spilt bunker fuel. The greatest exposure to fish habitat would occur in the intertidal zone, affecting non-motile invertebrate species (e.g., mollusks, clams, oysters, etc.) which are unable to avoid the spill and their habitats. TJLP referenced historic cases of oil spills and estimated that the effects of this scenario would be fully reversible within 10 years and would therefore be in the moderate consequence severity level (see Figure 17 above).

Tsawwassen First Nation raised concerns about the risk of grounding or collision and disagreed that the risk of a grounding or collision resulting in an LNG release would be low and that it would fall within the tolerable criteria. Tsawwassen First Nation noted that an LNG spill could affect Tsawwassen First Nation use, harvesting and cultural practices in Tsawwassen First Nation traditional territories. Further, TJLP and the EAO have inadequately considered how risks for collision or grounding may be magnified due to cumulative effects and climate change.

With respect release of LNG release, TJLP noted that the risk has been assessed to be "low" as release from grounding or collision of a double-hulled LNG vessel has never happened. Based on the short timeframe that is associated with presence of LNG (rapid vapourization or burning) following potential spill, that such an outcome of collision would have minimal effect on harvesting.

Pauquachin First Nation, Scia'new First Nation and Maa-nulth First Nations expressed concern that the potential effects of a bunker fuel release were not adequately assessed. They requested rationale for limiting the assessment scenario to a release of only half (1,250 cubic metres [m^3]) of the largest tank of bunker fuel allowable under MARPOL, as well as the spill only being considered at one location (Boundary Passage) at one time of year (spring).

TJLP explained that the assessment of potential bunker fuel release in the MSA was based on previous modelling results in the same geographic area, namely the TMX project for an 8,000 m^3 spill and RBT2 project for a 7,500 m^3 spill scenario. They noted that the effects of TMJ would be much less as the largest TMJ tank would be 2,500 m^3. TJLP also stated that while using TMX and RBT2 modelling results, the residual effects assessment for the MSA expanded the analysis to address spills anywhere in the MSA area, as well as effects of seasonal variation.

Tsleil-Waututh Nation requested that TJLP develop mitigations for the protection of a potential

fish weir that was identified at an archaeological site on the opposite bank of the Fraser River from the TMJ site in the event of a hazardous material spill.

TJLP responded that this site, amongst other archaeological and ecologically sensitive sites, would be specifically identified in a detailed Emergency Response Plan and Spill Prevention Plan in the Fraser River.

The EAO proposes a condition requiring the development of a CEMP and OEMP, which would include the requirement for emergency response and spill prevention in the marine terminal area, in consultation with Indigenous Groups and agencies. These plans would require a list of the cultural, socio-economic, ecological and biological resources that may be affected by a spill in the marine terminal area and the emergency response and spill prevention mitigation measures that will be implemented. The EAO also recommends KMMs under CEAA 2012 (Appendix 1) for an Emergency Response Plan for the marine terminal area, that includes a Spill Response Component Plan that would describe spill response procedures, and coordination with relevant agencies and response organizations. This plan would include a communication plan to notify Indigenous Groups and marine users about effects to access, including Indigenous use (for example, duration and extent of exclusion zones for fishing if an accident occurs).

COMPENSATION FOR SPILL DAMAGE

The Cowichan Nation Alliance, Malahat Nation and Maa-nulth Treaty Society requested additional information regarding compensation in the event of damage to interests or property from a vessel related spill and/ or collision of TMJ-related vessels with property such as fishing gear. Cowichan Nation Alliance, Tsawwassen First Nation and Tsleil-Waututh Nation also raised concerns that current regime would not compensate for non-economic losses due to an incident (i.e., loss to cultural value).

TC has confirmed that Canada has comprehensive liability and compensation regimes covering different types of marine risks involving ships, including oil pollution, the release of hazardous and noxious substances (HNS), collisions and wreck removal.

Specific to oil pollution, polluters are financially responsible, even if an incident is accidental. Shipowners are liable (responsible), up to a limit based on the size of their ship, for eligible claims of loss or damage, whether the pollution was caused by oil carried as cargo or used in the operation of the ship[133]. Shipowners are required to have insurance for all of their vessels that are 1,000 gross tonnes or larger in case of oil pollution damage caused by the oil they use as fuel or in the operations of the vessel. Tanker owners are required to have insurance if they carry 2,000 tonnes or more of persistent oil as cargo. If the costs of a persistent oil spill caused

[133] Eligible claims include: pollution prevention measures; clean-up costs; property damage; fisheries losses; subsistence losses; tourism losses; and environmental remediation. For more information on compensation visit: https://tc.canada.ca/en/marine-transportation/marine-safety/marine-liability-compensation-oil-spills

by an oil tanker were more than the tanker owner's limit of liability, additional compensation could be paid by international funds financed by industry and distributed by the International Oil Pollution Compensation Funds (IOPC Funds). Canada's domestic fund, the Ship-source Oil Pollution Fund (SOPF) is also available. The SOPF provides compensation for oil pollution damage caused by any type of oil from any type of vessel, even when the source of the spill is not known. There's no limit to the amount of compensation available from the SOPF for eligible claims[134].

Under the *Marine Liability Act* pollution damage means loss or damage outside of the ship caused by contamination resulting from the discharge of a pollutant from the ship. Thus, there is broader coverage provided than that specific to oil pollution. Currently, the compensation program has an economic focus. As part of the ongoing federal review of the *Marine Liability Act*, TC is looking at non-economic losses (e.g., inability to use certain sites, fish in certain areas or access culturally significant harvests).

Canada has ratified the 2010 Hazardous and Noxious Substances Protocol[135] that aims to ensure prompt and effective compensation for HNS incidents. The HNS Convention will add to the oil regime by covering more substances (including LNG) and additional damage (including for heavy oils), such as loss of life and personal injury, related to HNS incidents. Under the protocol, the shipowner is first and foremost strictly liable, up to a limit based on the size of their ship (up to ~200 million CDN), even if they are not at fault. They will be required to maintain insurance to cover up to their limits of liability. Shipowner liability will be complemented by an HNS Fund financed by contributions from industries that receive and import HNS. Once the Protocol enters into force, the HNS Fund will be created and approximately $500 million will be available per incident to cover eligible claims[136].

In Canadian waters, vessel owners are liable for the costs of removing wrecks that affect safe navigation or the environment. Vessels of 300 gross tons or more must carry mandatory insurance to cover the costs of locating, marking, and removing a wreck in case there is an incident. Insurance would also cover any losses that need to be claimed because of the wreck, like the removal of debris from the vessel. The amount of insurance a vessel needs depends on its size, as set out under the *Marine Liability Act*.

Regarding potential damage to property via collision, TC confirmed that vessel owners may be liable for damage to property as the result of a collision through a civil claim in the courts. The

[134] Ibid.

[135] The Protocol is not yet in force. The Protocol will enter into force 18 months after the Convention is ratified by twelve countries with major ports and industries receiving HNS. To date, five countries, including Canada, have ratified the 2010 Protocol.

[136] Eligible claims for HNS damage include: loss of life or personal injury; loss of damage to property outside of the ship; economic losses to the fishing and tourism industries; costs of preventive measures; and costs of reasonable environmental reinstatement.

liability of a vessel owner would depend on the circumstances under which the fishing gear was damaged and therefore whether a vessel is deemed to be at fault. The *Marine Liability Act* sets out the vessel owner's limits of liability.

BUNKER VESSEL SCENARIO

During the review of TJLP's BVSA Report, Working Group members raised concerns related to potential increased risks for spills, or accidents and malfunctions due to the increased frequency of vessel traffic associated with the BVS. Richmond noted concerns about bunker vessels without tug escort, and that the increased number of loading operations associated with the BVS could increase the risk of spills and fugitive emissions. Tsawwassen First Nation noted that TJLP's BVSA Report lacked information on risks of potential spills related to filling bunkering vessels under the BVS. Snuneymuxw First Nation identified that the release of LNG in a collision-related accident is of great concern, and that Snuneymuxw First Nation is equally concerned with the likelihood of a vessel-to-vessel collision, regardless of LNG release. Tsleil-Waututh Nation requested more details on how accidents and malfunctions remain unchanged under the BVS.

TJLP responded that the LNG shipping industry has a long record of safe operation, due to the safe and robust design and construction of LNG vessels, their specialized cargo containment systems, comprehensive operational procedures, crew training, equipment maintenance planning, continuous technological improvements, effective industry standards, and regulatory oversight by government.

TJLP noted that bunker vessels that call to TMJ are anticipated to be 'purpose built' bunker vessels. The updated information of likely bunker vessels confirms that designs of these bunker vessels have incorporated exceptional maneuverability and station holding capability and redundancy so as not to require the assistance of tugs; however, that determination would ultimately be made by the Port of Vancouver Harbour Master under its rules and criteria.

TJLP stated that likelihood of a collision or grounding incident involving a TMJ-related vessel was evaluated in Appendix G of the BVSA Report. In addition to an LNG release, a collision or grounding incident could result in the release of bunker fuel from the TMJ-related vessel or third-party vessel involved in the case of a collision, as discussed in the Application. While the likelihood of a collision or grounding increases with the increase in volume of bunker vessel traffic, the risk of a LNG release affecting a VC is expected to be similar to the scenario assessed in the Application, considering the smaller size and greater maneuverability of the bunker vessels relative to the larger LNG carriers. Thus, the increase in bunker vessel traffic is not expected to alter the conclusions of the Application, with respect to the potential risk of an LNG release due to collision or grounding. TJLP clarified that the risk of a loss of LNG containment during loading operations is similar under the BVS to what was originally assessed in the Application scenario, that the largest contributor to the risk is the potential allision involving a passing third-party vessel striking the TMJ facility. TJLP also identified that the likelihood of an LNG release due to failure of ensuring closed connections is very low considering the TMJ design and with the implementation of TMJ operations and maintenance procedures and that

the loss of product through failure to close valves is a small contributor to the overall risk of LNG release at the TMJ facility.

The EAO is of the view that marine shipping associated with TMJ would be required to meet the international standards and Canadian regulations set out by Canada's compliance-based marine safety and security system, which is designed to protect life, property, and the marine environment. The EAO is satisfied that the potential accidents and malfunctions associated with TMJ, including release of LNG in a collision-related accident, or vessel-to-vessel collisions, have been adequately identified and assessed for this EA, for both the Application scenario and BVS.

9.4 CONCLUSIONS

Potential interactions between TMJ and other past, present, and reasonably foreseeable projects were evaluated in the Application and reported in this chapter as part of the assessment of potential accidents and malfunctions, including potential interactions with the Tilbury LNG Plant and current and forecasted vessel traffic in the Fraser River and MSA Area. Other potential accidents and malfunctions are not expected to have temporal and spatial overlap with the residual effects of other past, present, and reasonably foreseeable projects.

The EAO has considered the TMJ design, mitigation measures, Canada's marine safety system, requirements for shipowner/ operators to have emergency response plans, and the following conditions identified in the TOC (which would become legally binding as a condition of an EAC), and recommended KMMs under CEAA 2012:

- Emergency response and spill prevention in the marine terminal area, as part of the Construction and Operational Environmental Management Plans (provincial conditions);
- Emergency Response Plan, in the marine terminal area (KMM);
- Marine Shipping Emergency Response Outreach Program (KMM); and
- Marine Access and Transportation Plan (KMM).

The EAO understands that public safety risk from activities at the jetty site would be discussed further following additional design, analysis and review of potential mitigations during the OGC permitting process (should an EAC be issued). TC noted that the assessment of probability and proposed mitigation measures in the Application and supplemental information appeared reasonable for the marine transit risk, considering the redundant layers of safety that make up Canada's marine safety system.

The EAO acknowledges that there is a high level of public, government and Indigenous concern regarding public safety risks associated with LNG activities. While the consequences for public safety due the loss of containment of LNG and ignition could reach substantial distances and be very high, after mitigation, the EAO notes that the likelihood of such an event is very rare, based on TJLP's definitions used in the quantitative risk analysis. The risk analyses conducted during the TMJ EA show the LSIR and societal risk fall into the Broadly Acceptable or Tolerable if ALARP ranges, for both the Application scenario and BVS. There is potential for extremely rare

likelihood but very high severity of consequences of accidents and malfunctions causing a SRKW fatality or irreversible damage to heritage resources, for which the residual risk is moderate, based on TJLP's definitions in the risk matrix. For potential effects of accidents and malfunctions on other environmental VCs, no significant effects are predicted effects and the residual risk level is low to moderate.

The EAO is satisfied that the potential accidents and malfunctions associated with TMJ have been adequately identified and assessed for this EA.

10.0 EFFECTS OF THE ENVIRONMENT ON THE PROJECT

10.1 BACKGROUND

The Application assessed the likelihood of the effects of environmental factors may have on TMJ and their consequences on relevant VC/ PCs. The following environmental effects and processes have the potential to affect TMJ and result in changes or effects to the VC/ PCs assessed in the Application:

- Climate change, including temperature, precipitation and sea level rise;
- Extreme weather-related events including wind, heavy rain, extreme temperatures, lightning, drought and fog;
- Flood risk from extreme tides and peak river flows;
- Seismic events;
- Volcanic events; and
- Tsunami, river slope stability and mass wasting events.

10.2 POTENTIAL PROJECT EFFECTS AND PROPOSED MITIGATIONS IDENTIFIED IN THE APPLICATION

CLIMATE CHANGE

The Application reported on the effects of climate change on TMJ, including potential for changing global and regional temperatures, precipitation and sea levels over the 30-year operations.

Since 1900, the average annual temperature in the southern coastal region of B.C. has increased at a rate of 0.8°C per 100 years, similar to the global average warming rate. The warming trend would affect all seasons, with the highest increase during the summer. The effects that could be influenced as a result of this scenario are the same as those listed in Section 9.2.1 (Hazardous Material Spills), Section 9.2.2 (Loss of LNG Containment), Section 9.2.5 (Failure of Sediment Containment) and Section 9.2.6 (Allision, Grounding or Collision of Vessels).

TJLP predicted that the rising sea level, superimposed on the periodic El Niño-Southern

Oscillation events, would likely result in increased frequency and severity of flooding, which could affect TMJ. The effects that could result from this scenario are the same as those listed in Section 9.2.1 (Hazardous Material Spills) and Section 9.2.5 (Failure of Sediment Containment).

The risks related to climate change (e.g., increased flooding) is discussed below.

EXTREME WEATHER-RELATED EVENTS

Potential effects of extreme weather assessed for TMJ include extreme temperatures, heavy precipitation (snow and rain), lightning, drought, fog (resulting in poor visibility) and high winds.

Over the life of TMJ, occasional extreme temperatures have the potential to interrupt operations temporarily due to safety concerns for TMJ personnel. To mitigate the potential safety risks to workers, the operational Health and Safety Plan would include precautions and preparation for extreme temperatures. TMJ would also be designed for extreme temperatures to mitigate potential structural effects to facilities and infrastructure including the pipeline rack and marine terminal to accommodate the forces and effects of thermal expansion and contraction. The LNG transfer system would be insulated to protect against ambient temperature fluctuations and freezing. TMJ infrastructure and systems would be inspected throughout Operations to ensure the design criteria are adequate.

Heavy precipitation may temporarily suspend some construction activities, and if accompanied by poor visibility may hinder navigation or berthing operations. TJLP predicted that extreme precipitation is unlikely to affect the LNG transfer system and unloading activities with the exception of excessive ice on the loading arm and other key equipment which may need to be removed before unloading operations. Effects that could result from heavy precipitation are listed in Section 9.2.1 (Hazardous Material Pills) and Section 9.2.5 (Failure of Sediment Containment). TMJ infrastructure would be designed to withstand 1:50-year rain and snow load in accordance with the National Building Code of Canada. TJLP has committed to review this design criteria during detailed design to ensure they meet long-term trends affected by climate change. TJLP assessed the increased risk for hazardous material spills and loss of sediment containment due to extreme precipitation and found that the risk to the environment is moderate and low respectively with no risk to public safety.

There is a potential for lightning strikes to occur in the TMJ area during the life of TMJ. In compliance with safe terminal operations, LNG loading operations would be suspended whenever lightning is observed in the vicinity. Weather alerts would be actively monitored, TMJ staff and ship crews would be trained to respond appropriately in case of lightning alerts.

TJLP assessed the potential effects of drought conditions on TMJ and concluded that because TMJ has low water demand it would be relatively unaffected by a shortage in regional water supply. It was also assessed that reduced water levels in the Fraser River would not result in effects, as the Fraser River would remain navigable due to tidal assist at its lower flow range. Therefore, it was concluded that drought conditions are not a material risk to TMJ.

Poor visibility could occur due to fog, heavy rain, or dust (for example, due to a volcanic event,

described below). TJLP reported that visibility data at YVR indicated that these poor visibility conditions occur up to approximately 4 percent of the year. The effects that could result from this scenario are the same as those listed in Section 9.2.1 (Hazardous Material Spills), Section 9.2.2 (Loss of LNG Containment) and Section 9.2.6 (Allision, Grounding or Collision of Vessels). To mitigate the potential effects of poor visibility and the resulting risk related to navigation of LNG vessels, TJLP described the requirements for vessel navigation. These include the Convention on the International Regulations for Preventing Collisions at Sea, which require that every vessel proceed at a safe speed adapted to prevailing circumstances and restricted visibility and the use of BC Coast Pilots and Fraser River Pilots which utilize a variety of computerized and GPS-enabled navigation and communication tools to mitigate poor visibility conditions. TJLP also confirmed that Fraser River pilots have full authority to choose the appropriate transit, berthing, or disembarking window based on weather conditions.

Extreme wind could result in extreme waves and damage to TMJ infrastructure in addition to creating navigational and worker safety hazards. The effects that could result from this scenario are the same as those listed in Section 9.2.1 (Hazardous Material Spills), Section 9.2.2 (Loss of LNG Containment) and Section 9.2.6 (Allision, Grounding or Collision of Vessels). To mitigate the effects of high winds on navigation, TJLP committed that LNG vessels would follow the Port of Vancouver TCZ-4 guidelines including the restriction from transiting, berthing, and disembarking on the Fraser River in winds exceeding 25 knots. To mitigate the potential damage to infrastructure, structures would be designed for the 1:50-year wind and wave loads, in accordance with the National Building Code of Canada. This design criteria for extreme wind and waves would be confirmed during detailed design to ensure they meet long-term trends and changes.

Given the relative stability in weather conditions on average in the TMJ area and the design and construction requirements of TMJ as well as maintenance standards, the likelihood and consequence of an extreme weather-related effect is low, therefore the risk is also considered to be low.

FLOOD EVENTS

The TMJ site is vulnerable to flooding from spring freshet in the Fraser River and from storm surge and high tide events due to its location in the lower Fraser River delta. The lower Fraser River floodplain is at highest risk of flooding during the spring snowmelt (May to Mid-July). The potential effects of an extreme flood event at TMJ include inundation of the onshore facilities due to dike breach of overtopping which could result in worker safety risk, sedimentation containment failure or structural damage.

TMJ facilities and infrastructure would be designed to reduce the likelihood and consequence of flood effects at TMJ. The onshore facility would be protected by the Fraser River dike which would accommodate the 1:200-year design flood. The FTBB would be a floating structure with the ability to move vertically to accommodate river level fluctuations and the permanent jetty is designed for an elevation above the extreme storm surge level.

The effects that could result from these scenarios are the same as those listed in Section 9.2.1 (Hazardous Material Spills) or Section 9.2.5 (Failure of Sediment Containment).

It is possible that an extreme flood event would occur within the life-span of TMJ, therefore the likelihood is considered to be moderate. Considering the mitigation measures to avoid or reduce the adverse effects of flooding at TMJ and potential subsequent effects on VCs, the consequence of an extreme flooding event is considered to be low. The overall risk during Construction or operation is therefore also considered low.

SEISMIC EVENTS

The Application assessed the potential for adverse effects related to natural seismic events that could result in associate hazards for TMJ, which may include ground motions on structures and facilities, permanent vertical and horizontal ground deformations, liquefaction of soil and seismically-induced slope failures. This could result in a loss of LNG containment onshore and offshore, discussed in Section 9.2.2 (Loss of LNG Containment), which could cause debris entering the Fraser River affecting marine use, toxic substances entering watercourses effecting fish and fish habitat, amphibians, marine mammals and wildlife.

To mitigate the potential risk of seismic events, TMJ would be designed to meet all applicable seismic design standards, including CSA Z276 and the recommended practices in the American National Fire Protection Association's NFP-59A standards for LNG facilities. TMJ facilities would be designed to remain operable with little to no damage following an Operating Basis Earthquake (1:475-year return period – with 10 percent probability of occurrence in 50 years). TJLP stated that while a 1:2,475-year earthquake may damage facilities rendering them inoperable, the facility would be designed to maintain the integrity of LNG containment (that is, no loss of LNG containment) in the event of this magnitude earthquake which has a 2 percent probability of occurring in 50 years. The Emergency Response and Spill Contingency Plan would include guidelines related to emergency response and guidelines regarding stability and integrity assessments following a seismic event.

Although TMJ would be located in a high-risk area for seismic activities, the likelihood of damage to infrastructure components would be low to moderate depending on the size of the earthquake (relatively small to large subduction).

The potential adverse effects of the seismic event would be mitigated through project design which would protect public safety, emergency routes and access, and structure stability compared to existing conditions. The corresponding overall risk to the TMJ and associated VC/ ICs is assessed as moderate for a large subduction event and low for a relatively small earthquake.

VOLCANIC EVENTS

The Application considered the potential effects of volcanic events on TMJ. The nearest active volcanos to the TMJ site are Mount Baker and Mount St. Helens in Washington State with Mount Baker the closest at approximately 100 km southeast. The resulting effect of the

potential ash from a volcanic eruption is hinderance of navigation related to TMJ and this scenario is addressed in Section 9.2.6 (Allision, Grounding, or Collision of Vessels). A secondary effect, with a lower likelihood, is for rock fragments to damage equipment and TMJ facilities and this scenario is addressed throughout Section 9 (Accidents and Malfunctions).

The potential adverse effects of a volcanic event on TMJ facilities and/ or navigation of TMJ-related vessels would be mitigated through project design which would protect public safety, emergency routes and access, and structure stability. The corresponding overall risk to TMJ and associated VC/ ICs is assessed as low.

TSUNAMI AND MASS WASTING EVENTS

The Application assessed the potential for tsunami and mass wasting that could affect TMJ. Earthquake generated tsunamis are unlikely to result in adverse effects because the Vancouver area is generally sheltered from Pacific Ocean tsunamis by Vancouver Island that would absorb the effect and diminish tsunami generated waves to less than 1 m in the Strait of Georgia and less than 0.5 m in the Fraser delta.

The Application also considered the risk of a landslide generated tsunami which could be caused by a massive landslide at the foreslope of the Fraser River delta into the Strait of Georgia. Although the likelihood of this type of tsunami is difficult to estimate, the consequences would include large waves of 18 m reaching the gulf islands, 2 m in Tsawwassen and less so at Tilbury Island.

The effects that could result from these scenarios are the same as those listed in Section 9.2.1 (Hazardous Material Spills) or Section 9.2.5 (Failure of Sediment Containment).

The potential adverse effects of a tsunami or mass wasting event on TMJ facilities and/ or navigation of TMJ-related vessels are unlikely to occur while the consequences are low due to low magnitude wave amplitude. The corresponding overall risk to TMJ and associated VC/ ICs is assessed as low.

BUNKER VESSEL SCENARIO ASSESSMENT

In the BVSA, TJLP did not predict changes to the Effect of the Environment on the Project from the increase in bunker vessel traffic. Environmental factors that could result in effects to vessel movements are captured in the assessment above, and the potential for these events to result in an accident is addressed under the Accidents and Malfunctions section.

10.3 POTENTIAL PROJECT EFFECTS AND PROPOSED MITIGATIONS IDENTIFIED DURING APPLICATION REVIEW

The following key issues related to the assessment of Effects of the Environment on the Project for TMJ were identified during Application review and based on feedback from the Working Group.

Natural Resources Canada (NRCan) requested additional information related to seismic events and the potential for effects on TMJ from earthquakes. The requests included a desire for more information on the types of earthquakes that could occur in the area, a seismic deaggregation plot (showing distance and magnitude of predominant earthquake sources) and use of the most recent earthquake hazard model in the assessment. In addition, NRCan requested supplementary information on active faults that may result in seismic events and confirmation of what studies would be undertaken in support of detailed design to address seismic risk.

> TJLP provided two technical memos in response to NRCan, the first of which provides additional description of the types of earthquakes that may occur in the TMJ area along with a seismic deaggregation analysis. The results of this supplemental analysis indicate that seismic conditions in the vicinity of the TMJ site are attributed to the offshore subduction of the Juan de Fuca Plate beneath the North American Plate. This seismicity could result in three earthquake types for the region each with varying magnitude, duration and distance to fault rupture. These include shallow crustal earthquakes occurring in the North American Plate, deep inslab earthquakes occurring in the subducting Juan de Fuca Plate and interface earthquakes that would occur at the boundary of the two plates.
>
> Shallow crustal earthquakes have a rupture distance of 10-20 km, up to a 7.5 magnitude with short duration and high frequency motions, and high peak ground accelerations (expressed as acceleration of gravity [g]) of 0.2 to 0.5 g. Deep inslab earthquakes have a larger rupture distance of 50-70 km, up to a M 7.5 magnitude with moderate duration and high frequency motions with high peak ground accelerations of 0.2 to 0.5 g. Interface subduction earthquakes have the largest rupture distance with magnitudes of up to M 9, the longest durations of up to several minutes with low frequency motions and moderate peak ground accelerations of 0.1 to 0.2 g.
>
> TJLP also provided a technical memo in response to NRCan's request for additional fault information. This memo provided a description of faults that has been included as an earthquake source by the US Geological Survey and/ or is classified as having activity in the last 15,000 years. This analysis indicates that there are 8 faults within approximately 100 km of the TMJ site. Review of these faults indicates that peak ground acceleration values range from 0.04 g to 0.13 g which is about one-third of the 0.38 g estimated from the 2015 National Building Code of Canada seismic hazard model for the Safe Shutdown Earthquake (SSE) scenario (2,475-year return period). This analysis suggests that the potential peak ground acceleration resulting from an earthquake from one of these faults would be considerably less than the SSE earthquake event that has informed design criteria.

Tsleil-Waututh Nation raised concerns about the proposed densification process proposed by TJLP to mitigate the potential for liquefaction during a seismic event and the associated consequences that include loss of load bearing support of foundations and ground displacement in the vicinity of TMJ. Tsleil-Waututh Nation also requested information on the

densification methods and how these may affect cultural heritage resources.

> TJLP responded that the likely means of densifying the soils underlying the site would be via installation of vibro stone columns and/ or installation of timber compaction piles. The vibro stone column technique was used successfully to improve the foundation soils supporting the onshore components of the Tilbury LNG Plant constructed in 2014 and a 400 m segment of the earthen dike along the south shoreline of the Fraser River closest to the TMJ site was successfully densified using the same techniques. TJLP committed to conduct on land archaeological testing in the densification area, prior to construction activities including densification, to assess the possible presence and likely depths of potential archaeological deposits beneath the imported fill that would be void of archaeological resources. TJLP also committed to providing a monitoring plan to Indigenous Groups and to following applicable regulations including submission of an application for a Section 14 permit per the HCA that would include consultation with Indigenous Groups prior to issuance.

10.4 CONCLUSIONS

Considering the above analysis and the conditions identified in the CPD and TOC (which would become legally binding if an EAC is issued), the EAO is satisfied that the likelihood of occurrence of effects of the environment on TMJ are low, and the magnitude of potential adverse effects after mitigation would likely be low.

11.0 CEAA 2012 REQUIREMENTS

An EA under the CEAA 2012 must take into account the environmental effects of the project as described in Section 5 and 19 of CEAA 2012. Section 5(1)(a) of CEAA 2012 is covered under Section 5.6 (Fish and Fish Habitat) and Section 5.7 (Marine Mammals) of this Report, as they overlap with provincial requirements. Section 19 of CEAA 2012 factors are covered in Section 9 (Accidents and Malfunctions), Section 10 (Effects of the Environment on the Project), and Section 2.25 (Alternative Means of Carrying Out the Project) of this Report. This section of the Report is intended to address the remaining Section 5 of CEAA 2012 factors.

11.1 FEDERAL LANDS, OTHER PROVINCES, AND OUTSIDE CANADA

An EA under the CEAA 2012 must take into account the environmental effects of the project as described in Section 5 of CEAA 2012. Paragraph 5(1)(b) of CEAA 2012 refers to a change that may be caused to the environment that would occur:

(i) On federal lands;
(ii) In a province other than the one in which the act or thing is done or where the physical activity, the designated project or the project is being carried out; or
(iii) Outside Canada.

The potential effects of TMJ on these three types of lands is discussed in this section.

11.1.1 FEDERAL LANDS

TMJ is located in the province of B.C. and does not occur on federal lands. However, federal lands are in the vicinity of TMJ in both the original Application area (Figure 18) and the MSA (Figure 19). VCs on federal lands that could be affected by TMJ include Noise (Section 6.2), Marine Mammals (Section 5.7) and Air Quality (Section 5.1). The TMJ local and regional assessment areas (LAA and RAA) for these three VCs overlap federal lands. In addition, wildlife on federal lands could also be affected via increased noise. Wildlife was not predicted to be affected on federal lands via effects other than noise.

In the original Application area (that is, jetty to Sand Heads), 13 federal lands were identified with the potential to be affected by residual effects from Air Quality, Noise or Marine Mammals. For the MSA, approximately 100 federal lands have the potential for residual effects from Air Quality and Marine Mammals. Federal lands in these two areas combined include parks, protected areas and historic sites; federal buildings; ports; airports; military bases and reserves, with reserves making up the majority.

11.1.1.1 FEDERAL LANDS – AIR QUALITY

TJLP identified that TMJ has the potential to increase concentrations of certain air contaminants. Federal lands located in the original Application area for the Air Quality LAA include: River Road – Deas Slough, the Portside Road Terminals, the Fraser Wharves, the Colonel Sherman Armoury, the Alaksen National Wildlife Area, and Steveston (Figure 18). Approximately 100 additional federal lands could be adversely affected by air quality effects in the MSA area (Figure 19).

As detailed in the Air Quality chapter (Section 5.1) of this Report, increases in air quality parameters in the original Application area are predicted as follows: annual NO_2 is predicted to be low magnitude and annual CO is predicted to be moderate magnitude, increases in 24-hour PM (both 2.5 and 10) are predicted to be of moderate magnitude and increases of one-hour NO_2 would be of high magnitude. All residual air quality changes are predicted to be local in extent, long-term (for the Normal Operations Scenario and Dredge Operations Scenario) or medium-term (for construction), reversible, infrequent to frequent, and of high likelihood.

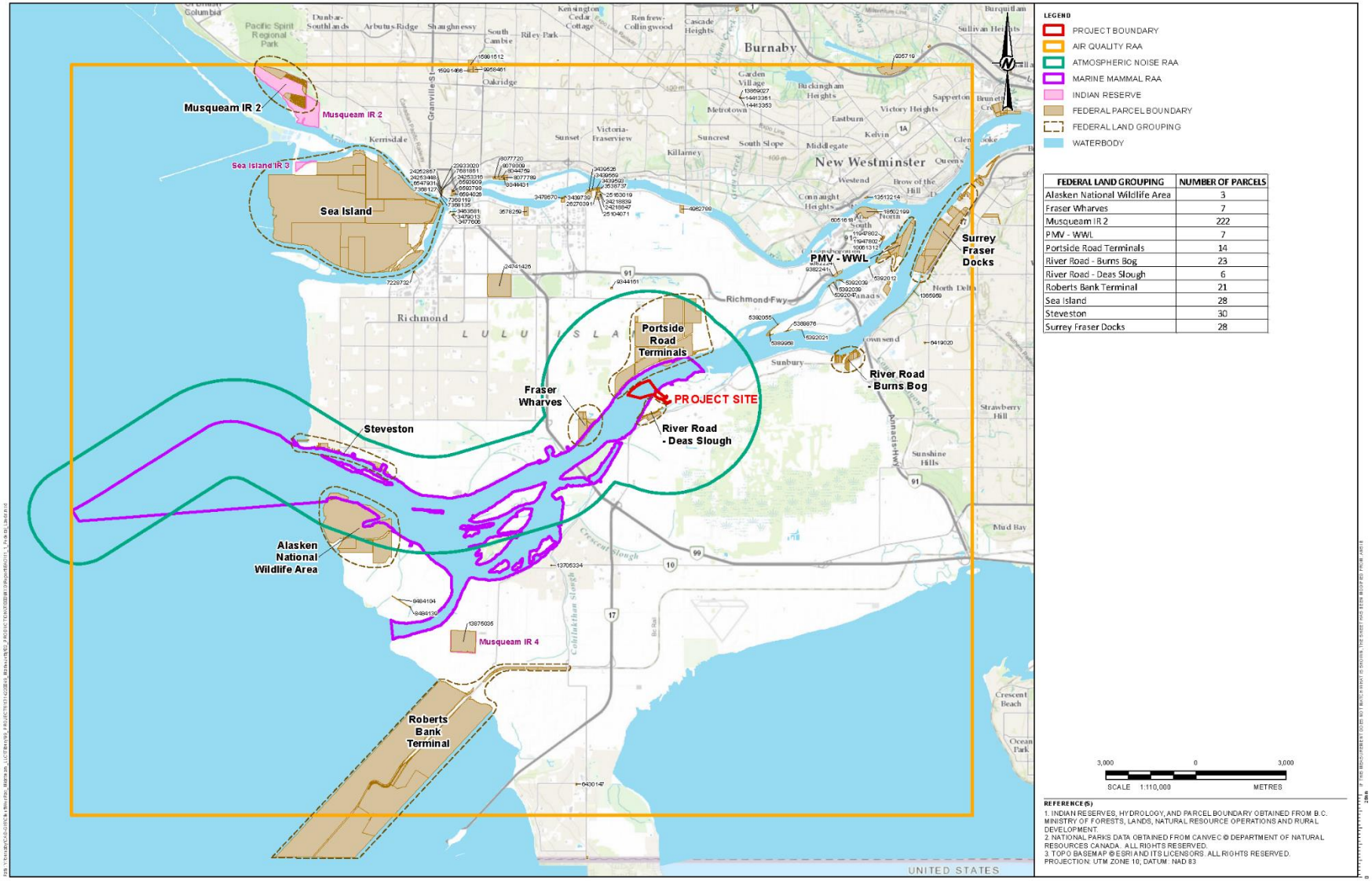

Figure 18: Federal Lands potentially affected by the Tilbury Marine Jetty in the original Application area (jetty to Sand Heads).

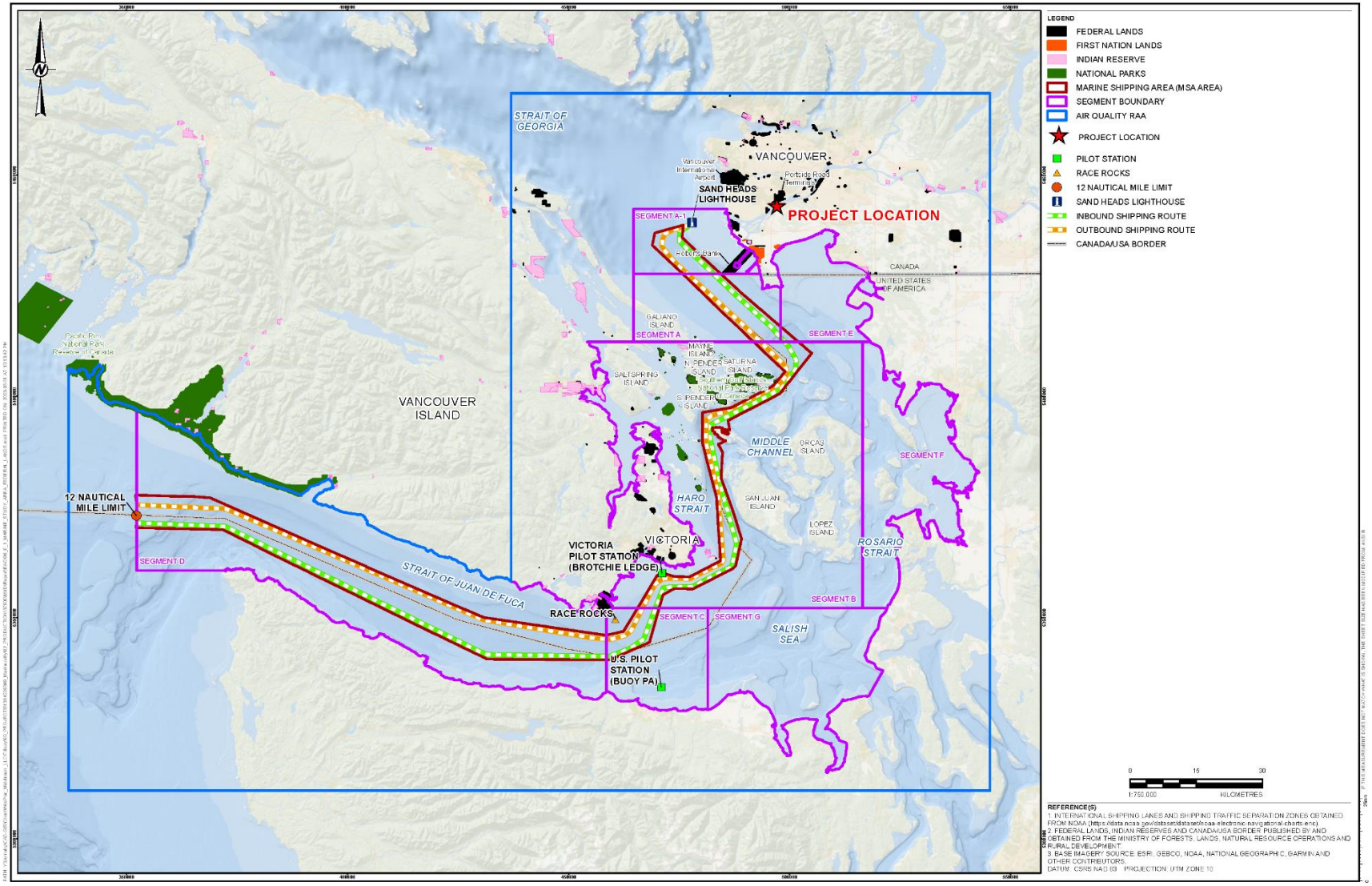

Figure 19: Federal Lands potentially affected by the Tilbury Marine Jetty Project in the Marine Shipping Assessment area.

In the MSA area, increases in 1-hour NO2 are predicted to be moderate, while all other air quality parameter increases would be negligible. Effects would be long-term, reversible, frequent (during normal operations) or infrequent (approximately 12 times per year when diesel powered LNG vessels are used).

As described in Section 5.1, the EAO concludes that residual effects on Air Quality in both the original Application area (for the Application scenario and BVS) and the MSA area would not be significant considering the conservative nature of the assessment methods and the implementation of proposed provincial conditions and recommended KMM under CEAA 2012 (see Air Quality chapter of this report for details on proposed conditions and KMMs for air quality).

The predicted changes in air quality parameters represent a worst-case scenario; therefore, the actual changes would likely be less than those described above for many federal lands. The proposed air quality mitigation measures would all target the source of air quality emissions; therefore, they would result in the mitigation of adverse air quality effects on federal lands. Because air quality changes are not significant with the implementation of mitigation measures, the EAO concludes that air quality effects on federal lands would also not be significant.

11.1.1.2 FEDERAL LANDS – ATMOSPHERIC NOISE

TJLP identified that TMJ, for both the Application scenario and BVS), has the potential to increase daytime and nighttime noise levels during construction and decommissioning. An increase in noise during operations was not predicted to be a residual effect for either the Application scenario or BVS. Federal lands in the original Application area for the Noise LAA, including River Road – Deas Slough, Portside Road Terminals, the Fraser Wharves, the Alaksen National Wildlife Area may experience elevated noise levels during construction and decommissioning. Noise was not assessed in the MSA because the shoreline in the MSA area is located one to 10 km from shipping lanes. Noise studies showed that noise levels within 220 m of passing ships do not increase above baseline levels. There are no federal lands within 220 m of shipping lanes in the MSA area; therefore, no federal lands would be affected by noise in the MSA area.

The Noise effects assessment is a PC for Wildlife and Wildlife Habitat, Socio-community, Land and Marine Resource Use, and Current Use of Lands and Resources for Traditional Purposes; however, of these VCs, only Wildlife and Wildlife Habitat are part of the assessment of Section 5(1)(b) of CEAA 2012.

As identified in the Noise chapter (Section 6.2) of this Report, residual noise effects were determined to be of negligible to low magnitude, local extent, short- to medium-term (limited

to construction and decommissioning) and reversible. Although an increase in noise is likely to occur, the EAO does not predict that it would be significant. As identified in the Wildlife and Wildlife Habitat chapter (Section 5.9) of this Report, noise effects on wildlife are predicted to be of negligible to low magnitude. TMJ is located in an existing industrial area and wildlife are likely adapted to the industrial activities. The EAO has proposed provincial conditions and recommended KMMs under CEAA 2012 for noise management mitigation measures (see Noise chapter of this Report for details on proposed conditions and KMMs for noise). With the implementation of mitigations, the EAO concludes that sensory disturbance (including noise and light) is not likely to cause significant adverse effects to Wildlife and Wildlife Habitat. The EAO is, therefore, of the view that noise effects to federal lands would also be not significant.

11.1.1.3 FEDERAL LANDS – MARINE MAMMALS

TJLP identified that effects of TMJ (for the Application scenario and BVS) on marine mammals could include loss of habitat, changes to habitat quality, and changes in the abundance and distribution of marine mammals, such as behavioural disturbance or injury due to TMJ-generated underwater noise, and injury or mortality due to vessel strikes. In the original Application area, the Alaksen National Wildlife Area overlaps with the Marine mammal LAA. In addition, the Fraser Wharves and Steveston federal lands overlap with the Marine Mammal RAA. In the MSA area, the Marine Mammals Marine Shipping Assessment Area overlaps with approximately 20 federal lands.

As identified in the Marine Mammals section (Section 5.7) of this Report, residual effects from TMJ (Application scenario and BVS) to marine mammals are expected to range from low to moderate magnitude for behaviour disturbance due to underwater noise and up to high magnitude for vessel strikes on federal listed species). Residual effects are also expected to be infrequent to frequent (vessel noise) to infrequent (vessel strikes). To mitigate effects, the EAO recommends KMMs under CEAA 2012 for a Marine Mammal Management Plan to mitigate effects from activities at the TMJ site to marine mammals and a Vessel Traffic Management Plan to reduce the likelihood of vessel strikes and reduce underwater noise from shipping (see Marine Mammals, Section 5.7 of this Report, for details on KMMs for marine mammals).

With the implementation of these mitigations, the EAO concludes that no significant residual adverse effects to marine mammals are expected to occur from TMJ alone. Consequently, no significant residual adverse effects to marine mammals on federal lands are predicted as a result of TMJ alone.

As noted in the Marine Mammals chapter, the EAO concludes that the predicted residual effects from TMJ interacting with existing baseline conditions (which include existing threats to

the SRKW population), existing projects and other reasonably foreseeable future projects would contribute to significant adverse cumulative effects on SRKW due to underwater noise for the Application scenario and the BVS. Of the federal lands in the original Application area that overlap with the Marine Mammal LAA or RAA (Alaksen National Wildlife Area, the Fraser Wharves and Steveston), there is a small amount of overlap with of the Alaksen National Wildlife Area and Steveston (DgRt-6) with the SRKW key foraging area (see Figure 7, Section 5.8) at the mouth of the Fraser River. There is no overlap with the Fraser Wharves and SRKW critical habitat or sensitive areas. The extent of this overlap is limited because the Alaksen National Wildlife Area and Steveston are primarily on land, with only a small piece of these areas extending into the river and ocean along the shoreline. Similarly, for the 20 federal lands that overlap the Marine Mammals Marine Shipping Assessment Area, the area of federal lands that are underwater and where SRKW could visit and experience underwater noise is limited. Therefore, the potential for cumulative underwater noise effects on SRKW on federal lands is considered to be minimal.

11.1.2 OTHER PROVINCES

TMJ is located approximately 600 km from the closest province, Alberta. This distance is beyond the range where effects of TMJ would be expected to extend, with the exception of GHG.

As described in the Greenhouse Gas Management chapter (Section 5.2) of this Report, maximum GHG emissions associated with TMJ-related vessels traveling from the TMJ site to the 12 nm limit may range from up to 29.22 to 31.64 kt CO_2e/yr, depending on the mix of domestic and international vessels. TJLP estimates that total GHG emissions from TMJ-related domestic vessels (in the original Application area and in the shipping corridor in the MSA) would equal 15.25 kt/year for the Application scenario and 17.91 kt CO_2e/year for the BVS. Total GHG emissions from TMJ-related domestic vessels represents 0.02 percent of B.C. (2019 levels) and 0.002 percent of Canada (2017) emissions. The EAO considers this percentage to be a low magnitude effect. The EAO, therefore, does not predict TMJ would result in a change to the environment in other provinces.

11.1.3 OUTSIDE CANADA

The TMJ site is located approximately 16 km north of the United States-Canada Exclusive Economic Zone boundary and 25 km northwest of the Washington State Border. The United States is not within the original Application area for TMJ and TMJ (as assessed in the original

Application) is not predicted to affect the environment of the United States except via GHG emissions, which are discussed further below.

The MSA area is located within the international shipping lanes which follow the Canada-US border. For the MSA area, TJLP noted that effects predicted for VCs along the Canadian side of the border are expected to be similar on the US side of the border because the existing conditions for VCs are similar on either side. The EAO predicted effects to VCs in the MSA area include non-significant residual effects on Air Quality (Section 5.1), Marine Mammals (Section 5.7), Marine Birds (Section 5.9), Visual Quality (Section 8.3) and Current Use for Lands and Resources for Traditional Purposes (Section 11.4). Refer to the VC-specific sections for further details. The EAO has concluded that significant residual adverse effects are not expected in the MSA area for any VC from TMJ alone. Effects on specific landmasses in the Unites States were also considered. The western end of Stuart Island (the closest US landmass in the MSA area) is within one km from TMJ shipping lanes and is the only United States landmass that intersected the MSA Area. Effects from vessel wake on shoreline erosion on Stuart Island are not expected at Stuart Island, even under calm conditions (increase of 0.0067 percent in wave energy).

As described in Section 11.1.2 above, maximum GHG emissions associated with TMJ-related vessels may range from up to 29.22 to 31.64 kt CO_2e/yr, depending on the mix of domestic and international vessels. Although GHG emissions are global in nature, the contributions from TMJ are considered to be very small on a global scale, with both the Application scenario or the BVS predicted to increase Canada's GHG emissions by 0.002 percent over 2017 levels. Please refer to the section on Greenhouse Gas Management (Section 5.2) for additional information on predicted GHG emissions from TMJ and an analysis on upstream GHGs.

In consideration of the above information, the EAO concludes that no significant adverse changes to the environment outside of Canada are predicted as a result of TMJ.

11.2 FEDERAL AUTHORITY

11.2.1 CEAA 2012 5(2)(A)

Section 5(2)(a) of CEAA 2012 refers to changes to the environment, other than those referred to in Section 5(1) of CEAA 2012, that are directly linked or necessarily incidental to the exercise of a power, performance of duty or function, or decision of a federal authority. Based on this, TMJ may be required to obtain permits and authorizations from DFO, TC, and ECCC.

If approved, TMJ is expected to require a *Fisheries Act* authorization for the HADD of fish habitat, which may affect wetlands and require wetlands offsetting. A Fish Habitat Offset Plan would be required to offset effects and maintain the ongoing productivity of commercial, recreational and Indigenous fisheries, and potential effects of the authorization would be considered as part of the DFO permitting process.

There would not be an environmental effect from approvals under the *Canadian Navigable Waters Protection Act* that is distinct from the effects of the construction and operations of TMJ. TMJ may result in effects on navigation of commercial and non-commercial vessels. See Section 8.2 (Land and Marine Resource Use) for further details.

As described in Section 2.2.5, Alternative Means of Undertaking the Project, TJLP intends to identify a land-based location for the commercial use and/ or disposal of dredge material, if TMJ receives an EAC. If an on-land site cannot be established, TJLP has indicated that the disposal of dredge material at sea may be alternatively pursued if deemed economically and logistically viable. In this case, TJLP would require a DAS Permit under the *Canadian Environmental Protection Act* for TMJ.

TJLP identified that disposal of dredge material at sea would have the following potential effects:

- Increase in TSS and turbidity and increase in contaminants;
- Mortality to fish and benthic invertebrates;
- Disturbance or loss of fish habitat;
- Effects on marine mammals due to interactions with disposal at sea vessels (injury or mortality of marine mammals due to vessel strikes, effects from underwater noise, uptake of contaminants during disposal);
- Increase in combustion emissions including GHG emissions from vessels;
- Disturbance to aquatic birds; and
- Temporary effects on navigation of commercial and non-commercial marine vessels.

A summary of federal authorizations and potential effects to the environment is contained in Table 31 below.

Table 31: Summary of Federal Authorizations for TMJ

Authorization	Relevant Federal Agency	Description of Need for Authorization and Potential Effects on the Environment
Authorizations Concerning Fish and Fish Habitat Protection Regulations	DFO	Construction and operations of TMJ have the potential to adversely affect fish and fish habitat. As a result, TMJ is expected to require ministerial authorization as detailed in Section 35(2)(b) of the *Fisheries Act*, which may affect wetlands and require wetlands offsetting. Wetlands offsetting would be under the *Fisheries Act* and authorized by DFO. Potential effects to wetlands from TMJ have been discussed and assessed in the Vegetation chapter (Section 5.8 of this Report).
Section 15(3) Approval(s) under the *Canadian Navigable Waters Act*	Transport Canada	The proposed construction and operations of the marine jetty infrastructure, and ancillary activities (including but not limited to dredging and fish habitat offset works, FTBB) being located on the Fraser River have the potential to obstruct/ impede on navigation and may need approvals under the *Canadian Navigable Waters Act*. Potential effects to navigation from TMJ have been discussed and assessed in the Land and Marine Use chapter (Section 8.2 of this Report).
Disposal at Sea Permit	ECCC	TMJ is expected remove a considerable volume of dredge material during construction. Substances listed in Schedule 5 of the *Canadian Environmental Protection Act*, including dredge material, have the potential to significantly affect marine environments if released. TMJ would be required to obtain a DAS Permit, in the event of disposal in a marine environment. Please see Part A (Section 2.2.5) for a discussion of potential effects from the various alternatives for dredgeate disposal.

11.2.2 CEAA 2012 5(2)(B)

Section 5(2)(b) of CEAA 2012 refers to changes that result in an effect on health, socio-economic conditions, any structure, site or thing of historical, archaeological, paleontological or architectural significance, or other matters of physical or cultural heritage not already considered under paragraph 5(1)(c) that results from a federal power, duty or function. As described above, a potential DAS Permit is the only potentially relevant exercise of power or performance of duty or function by federal authority relevant to Section 5(2)(b) for TMJ.

Activities associated with a DAS Permit could affect socio-economic conditions due to potential effects on marine recreation or non-Indigenous fishing. Marine vessel movements for transport

of dredged sediments may temporarily affect navigation, area access and area use by commercial and non-commercial marine vessels, or change the distribution and abundance of marine mammals, coastal birds, harvestable fish and seafood species that could affect commercial and recreational fish harvesting and guided sport fishing and marine tourism.

TJLP noted in the Application that Sand Heads and Point Grey are the closest disposal at sea sites near TMJ and are being considered for dredgeate disposal for TMJ; however, a disposal site would be selected in consultation with ECCC, DFO, affected Indigenous Groups and key stakeholders as part of the DAS Permitting Process. Sand Heads and Point Grey are existing marine disposal sites; therefore, the EAO considers that the use of these sites by TMJ would have limited effects on the factors under 5(2)(b) (See Table 34 in Appendix 3 of this Report). The EAO, therefore, does not predict that significant adverse effects under Section 5(2)(b) of CEAA 2012 would result from TMJ for either the Application scenario or the BVS.

11.3 HEALTH AND SOCIO-ECONOMIC CONDITIONS OF INDIGENOUS PEOPLES

11.3.1 BACKGROUND

As required under the CEAA 2012 subparagraph 5(1)(c)(i), the potential environmental effects of the TMJ on the health and socio-economic conditions of Indigenous peoples were evaluated by TJLP.

The Application assessed potential effects on Indigenous health and socio-economic conditions through the following VCs: Land and Marine Resource Use (Section 6.2 of the Application), Visual Quality (Section 6.4 of the Application), Socio-community (Section 6.1 of the Application) and Human Health (Section 8.8 of the Application). The Application assessed potential TMJ-induced changes to air quality, water quality, noise levels, visual quality, and changes affecting quality and accessibility of terrestrial and aquatic resources for FSC purposes. These potential changes in environmental quality were then evaluated for potential corollary effects to the human health and socio-economic conditions experienced by Indigenous Groups.

MARINE SHIPPING ASSESSMENT

The MSA assessed potential effects on Indigenous health and socio-economic conditions through the following VCs: Marine Resource Use (Section 4.1 of the MSA), Visual Quality (Section 4.3 of the MSA) and Human Health (Section 4.5 of the MSA). The MSA assessed potential TMJ-related changes to navigational use and navigability, resource availability (of

marine mammals), daytime and nighttime viewing conditions, and air quality. These potential changes in environmental quality were then evaluated for potential corollary effects to the human health and socio-economic conditions experienced by Indigenous Groups.

11.3.1.1 REGULATORY CONTEXT

The assessment of project effects on the environment that may affect the health and socio-economic conditions of Indigenous peoples is required under Section 5 (1) (c) (i) of CEAA 2012.

11.3.1.2 BOUNDARIES

In the Application and MSA, specific boundaries were not attributed for the assessment of environmental effects of TMJ on the health and socio-economic conditions of Indigenous peoples. For the assessment, the EAO considered the overlap of contributing VCs (such as Land and Marine Resource Use, Visual Quality, Socio-Community, and Human Health) with each Schedule B, Schedule C and Schedule D Indigenous Group's area of use for traditional purposes.

11.3.2 POTENTIAL PROJECT EFFECTS AND PROPOSED MITIGATIONS IN THE APPLICATION

The Application relied on the assessment of the VCs that could result in effects to health and socio-economic conditions of local Indigenous peoples. For a summary of TJLP's assessment of the PCs, please refer to VC-specific sections of this Report: Human Health (Section 6.1), Socio-community (Section 8.1), Land and Marine Resource Use (Section 8.2), and Visual Quality (Section 8.3). TJLP's assessment concluded that residual and cumulative effects to 5(1)(c) components were assessed to be not significant.

See also the Bunker Vessel Scenario Assessment sections in this Report which summarize TJLP's assessment for the VCs listed above.

11.3.3 POTENTIAL PROJECT EFFECTS AND PROPOSED MITIGATIONS IDENTIFIED DURING APPLICATION REVIEW

The following key issues related to the assessment of Health and Socio-economic Conditions of Indigenous Peoples were identified during Application review.

During Application review, Cowichan Nation Alliance, Tsawwassen First Nation, Tsleil-Waututh Nation raised concerns regarding VCs and pathways of effects associated with Indigenous health and socio-economic conditions. The concerns are described in the assessments on relevant PCs in this Report (as above in Section 11.3.2). The EAO received comments and

additional information from Indigenous Groups on the assessment of Indigenous health and socio-economic conditions primarily during the Working Group review of the EAO's draft Assessment Report. These comments have been summarized below.

Cowichan Nation Alliance raised concerns that Cowichan Nation Alliance community members would experience heightened stress and an increase in anxiety as a result of fears associated with the safety risk at the former Indigenous village site across the river from the TMJ site. Cowichan Nation Alliance noted negative effects on the health and well-being of community members due to uncertainty of potential accidents and safety and that the predicted likelihood of accidents and malfunctions in TJLP's Application is not directly related to on the heightened feeling of stress by affected community members.

> During Application review, in response to Working Group comments, TJLP conducted further detailed societal risk analyses to evaluate potential public safety risks from the LNG loading operations and marine transit components of TMJ. Please refer to Accidents and Malfunctions, Section 9 of this Report, for more details about the risk analyses conducted and TJLP's conclusions.

In the assessment of Accidents and Malfunction, the EAO considered the TMJ design, mitigation measures, and Canada's marine safety system, requirements for shipowner/ operators to have emergency response plans. The EAO proposes Condition 10: Construction Environmental Management Plan and Condition 11: Operations Environmental Management Plan requiring emergency and spill response mitigation, the EAO recommends KMMS under CEAA 2012 for an Emergency Response Plan, Marine Shipping Emergency Response Outreach Program and Marine Access and Transportation Plan. For more details on the EAO's conclusions on the risk of potential accidents and malfunction, refer to Section 9 of this Report. The EAO acknowledges there is uncertainty about how community members may respond to the real and/ or perceived uncertainty related to potential accidents or malfunctions and the feelings of stress by affected community members and have considered this in the analysis in Section 11.3.4.

Tsawwassen First Nation raised concerns that effects to Tsawwassen First Nation's ability to practice their Treaty right to harvest and practice their stewardship would negatively affect members' health and socio-economic conditions. In particular, Tsawwassen First Nation noted that a reduction in access to traditional foods and medicines through a reduction in harvesting access could result in effects to member's health and socio-economic conditions, including those that are important to Tsawwassen's Indigenous economy. Tsawwassen First Nation also noted that effects to harvesting also compromise knowledge transmission and cultural continuity, which in turn harms both the health and socio-economic conditions of members. Esquimalt First Nation, Pacheedaht First Nation, and Maa-nulth First Nations expressed

concerns about the cumulative effects of the marine shipping industry on their well-being. Esquimalt First Nation stated that the signs of an already declining marine ecosystem and a shifting economy on the West Coast are concerning for Esquimalt First Nation. Maa-nulth First Nations stated that they are already experiencing stress from marine shipping projects and view any further increase in large vessel traffic through the Maa-nulth Domestic Fishing Area as significant.

> TJLP reported that there would be no change to access of plant harvesting due to TMJ, given that the TMJ site has been an industrially modified site for many years with low availability of traditionally used plant species and limited access. TMJ confirmed that to reduce potential shipping-related effects to Indigenous fishers during DFO fisheries openings, TJLP would try to avoid FSC fishery openings and noted that the marine communication plan would set out the protocols to communicate TMJ-related shipping schedules. TJLP proposed a marine access and transportation plan at the site to maintain commercial and non-commercial vessel navigation. TJLP also committed to additional, on-going consultation with Indigenous Groups to minimize conflicts with fishing windows and better identify methods of reducing effects from marine vessel traffic.

The EAO notes that access to fishing, hunting, trapping and gathering practices, including from marine vessel traffic, are assessed in Current Use of Lands and Resources for Traditional Purposes (Section 11.4) and effects to Indigenous Groups are assessed in Part C of this Report. To mitigate effects to access, the EAO recommends KMMs under CEAA 2012 for a Marine Communication Plan and Marine Access and Transportation Plan. The EAO acknowledges uncertainty related effects of TMJ on knowledge transmission and cultural continuity, and views of Indigenous Groups on the potential for effects on the health and socio-economic conditions of their members.

Tsawwassen First Nation also raised concerns regarding effects to the health of members and their ability to exercise their Treaty rights in their traditional territory due to TMJ effects on air quality, noise, and visual quality of the landscape and seascape in the area, and the potential contamination of country foods such as berries. Tsawwassen First Nation's noted the importance of the Indigenous perspective and experiences with respect to impediments to harvesting practices and ability to transmit Tsawwassen First Nation's culture when faced with industrial noise and perceptions of health risks.

> TJLP concluded that adverse health effects are anticipated due to TMJ effects on air quality under specific modeled conditions, and not expected due to TMJ effects on noise and visual quality. TJLP did not identify constituents of potential concern in the baseline

soil data or the predicted soil quality (which include potential deposits from the air due to TMJ). TJLP did not identify exposure pathways to humans through the ingestion of berries, water or fish. TJLP also noted that TMJ would provide LNG for bunkering as fuel for shipping in the region displacing oil-based fuels which has the potential of reducing harmful emissions from existing shipping.

To mitigate effects to human health and the quality of experience of current use and cultural heritage activities, the EAO proposes Condition 17: Indigenous Cultural Awareness, Recognition and Mitigation, Condition 10: Construction Environmental Management Plan and Condition 11: Operations Environmental Management Plan with noise and lighting management components, and Condition 19: Air Quality Management Plan. The EAO also recommends KMM under CEAA 2012 for an Air Quality Management Plan. The EAO acknowledges Tsawwassen First Nation's perspective and perceptions of contamination and health concerns.

Tsleil-Waututh Nation raised concerns that conventional HHRAs do not account for differences in Indigenous and non-Indigenous consumption rates, and do not reflect the link between the consumption of traditional foods such as shellfish, salmon and berries and Indigenous culture. Tsleil-Waututh noted that eating lower amounts of fish and shellfish rather than the subsistence amounts is a health risk and an emotional and spiritual loss related to traditional activities, ceremonies and a sense of place and collective identity. Tsleil-Waututh Nation explained that the lack of access to traditional food resources due to contamination, regulatory restrictions or stock availability is detrimental to Tsleil-Waututh Nation's health.

TJLP did not identify exposure pathways through incidental soil ingestion or contact with soil, or ingestion of berries or game. Considering mitigations, TJLP did not predict residual effects to water quality; therefore, potential changes to fish quality resulting from potential changes to water quality was not considered a primary pathway. TJLP indicated that it is expected that mitigation measures to address potential effects on instream access for FSC fish harvesting would be effective in addressing effects to Indigenous Groups engaging in traditional activities within the LAA.

The EAO acknowledges that HHRAs do not capture certain aspects of Indigenous cultural health, and do not assess the emotional and spiritual loss that Tsleil-Waututh members may experience due to changes to access to traditional food resources and Indigenous perceptions related to contamination of traditional foods.

11.3.4 THE EAO'S ANALYSIS AND CONCLUSIONS

In undertaking the analysis of and drawing conclusions on CEAA 2012 5(1)(c)(i) requirements, the EAO considered the information provided in the Application, MSA and BVSA, the comments from Indigenous Groups and TJLP's responses, and additional information such as available traditional use studies of Indigenous Groups. The EAO evaluated effects to socio-economic components and effects to human health components as a result of TMJ-induced changes to environmental quality. The EAO's conclusions apply to all Indigenous Groups listed on Schedule B, C, and D of the Section 11 Order.

Key Effects and Mitigations for Socio-Economic Components

The EAO evaluated key potential effects to socio-economic components, including Socio-Community (Section 8.1), Land and Marine Resource Use (Section 8.2), and Visual Quality (Section 8.3) VCs, because of TMJ-induced changes to the environment. The EAO acknowledges the potential for some Indigenous Groups and/ or individuals to be adversely affected by incremental changes to the environment caused by intermittent transiting of TMJ-related vessels and the support vessels (tugs) for LNG carriers for the Application scenario and BVS. TMJ-related vessel traffic has the potential to interrupt Indigenous Group's access and enjoyment of the marine environment (Section 8.2, Land and Marine Resource Use and Section 11.4, Current Use of Lands and Resources for Traditional Purposes) including FSC fishing, Aboriginal and Treaty rights, commercial uses, intergenerational knowledge transfer and the ability to practice rights in the preferred manner. TMJ-related vessel traffic has the potential to affect the safety and perception of safety of Indigenous marine resource users. This effect could occur from the TMJ jetty, out to Sand Heads, and out into the waters of the Salish Sea.

The EAO notes compliance with maritime regulations and legislation, and timing construction and operations activities to avoid commercial and non-commercial salmon fishery openings would reduce conflicts with TMJ vessels and Indigenous marine users. These measures are likely to mitigate potential effects to Land and Marine Resource Use and Current Use of Lands and Resources for Traditional Purposes VCs to a certain degree.

The EAO recommends a KMM under CEAA 2012 (Appendix 1) for a Marine Access and Transportation Plan in the lower Fraser River which would include mitigations to reduce disruptions caused by construction and operations for commercial and non-commercial marine users. TJLP would also be required to identify, in consultation with Indigenous Groups and DFO via publicly accessible information on recently issued DFO licences, fishing licences and other Indigenous traditional uses. TJLP would also be required to develop measures to mitigate effects on Indigenous traditional use activities, including LNG carrier call scheduling that

accounts for and attempts to reduce LNG carrier calls during the anticipated timing window for Indigenous fishers operating under DFO fishing licences. TJLP would also synchronize bunker vessels arrivals at and departures from the jetty with regularly scheduled marine traffic (not associated with TMJ) when Indigenous fishers are operating under DFO fishing licences. TJLP would be required to provide opportunities to Indigenous Monitors to participate in monitoring during FSC fisheries windows to determine the effectiveness of the mitigation. The Marine Access and Transportation KMM includes a follow-up program pertaining to adverse effects on Current Use of Lands and Resources for Traditional Purposes. The EAO also recommends a Marine Communication Plan as a KMM under CEAA 2012 which would identify the procedures to notify Indigenous Groups and other Marine Users of planned activities associated with TMJ as well as a means by which Indigenous groups and other marine users can provide feedback to TMJ on adverse effects related to navigation as a result of TMJ activities.

The EAO also acknowledges that TMJ is anticipated to have positive effects to the Economy VC (Section 8.4, Economy) which would have a positive effect on income, employment and working conditions for Indigenous people. This positive effect was considered a benefit to community health and well-being. The EAO proposes Condition 16: Indigenous Training, Employment and Procurement Plan, which would be developed in consultation with Indigenous Groups (Schedule B) and include measures to support the procurement of goods and services from businesses owned by Indigenous Groups and to provide training opportunities for Indigenous monitors and enhance the hiring and retention of Indigenous Groups and their members. The EAO also proposes Condition 9: Indigenous Monitors and recommends a KMM under CEAA 2012 for Indigenous Monitors to determine opportunities for Indigenous Group (Schedule B) participation in the implementation of all required monitoring, including how TJLP would support participation by providing training and equipment.

In consideration of the views of Indigenous Groups concerning access to fish and traditional foods and medicine, including those important to Indigenous economy, the EAO concludes that there would be a predicted residual effect to Indigenous socio-economic conditions from TMJ, which is likely to interact with existing and foreseeable future projects. Considering the EAO's proposed provincial conditions and recommended KMMs under CEAA 2012, and the conclusions related to the VC's described above, the EAO concludes that residual and cumulative effects are unlikely to be significant for the Application scenario and BVS. The EAO acknowledges that views of Indigenous Groups and the assessment of impacts on access to fish and traditional foods and medicine are discussed in Current Use (Section 11.4) and Part C sections of this Report.

Key Effects and Mitigation Measures for Indigenous Health

The EAO evaluated key potential effects to components of Indigenous health due to changes from TMJ to the environment. Below is a summary of the EAO's conclusions on key Indigenous health effects pathways reported in this Report for the Application scenario and BVS:

- **Noise (Section 6.2):** The EAO concludes that there would be negligible to low effects to noise during construction and decommissioning at the TMJ site.
- **Nighttime Light (Section 8.3)**: The EAO concludes that there would be negligible effects to nighttime viewing. TMJ light sources associated with construction are likely to be indistinguishable from background/ existing light sources. During operations, new light sources would be introduced from prominent navigational and floodlighting of the marine jetty and the navigational lighting TMJ-related vessels. While these light sources may appear prominent within the existing lighting conditions, which currently has a range of direct light sources and ambient lighting, it is anticipated that they would have no effect on the existing level of brightness locally and regionally.
- **Visual quality (daytime viewing) (Section 8.3)**: The EAO concludes that there would be negligible to low effects to daytime viewing. TMJ would result in noticeable presence of visible TMJ components and marine vessel movements but is not expected to change the visual character of the landscape. Given the existing landscape conditions around the TMJ site, including marine industrial infrastructure and activity along the Fraser River, TMJ would minimally disrupt user experience. In the MSA, users would have temporary visibility of vessels while transiting through the LAA, however, these effects are considered negligible as a result of the small number of TMJ associated vessels (up to two to three per week for the Application scenario) and compliance with both Maritime Regulations and Legislation, and Regulations related to required navigational lighting.
- **Air Quality (Section 5.1) and Human Health (Section 6.1):** The EAO concluded that there would be low-moderate residual effects to Human Health as a result of change in Air Quality. Proposed provincial conditions and the EAO's recommended KMMs under CEAA 2012 for air quality also apply to human health:
    - Condition 19: Air Quality Management Plan (provincial condition) and Air Quality Management Plan (KMM) with best management practices to mitigate effects to air quality.
- **Community Health and Well-being (Section 8.1):** The EAO concludes that there would

be negligible effects to Community Health and Well-being (subcomponent that addresses social determinants of heath).

- **Current use and consumption of land and marine resources (including FSC, country foods [fish, wildlife, and vegetation], and commercial harvest)(Section 11.4):** The EAO concludes that there would be negligible to low effects on Land and Marine Resource Use (Section 8.2), and negligible to moderate effects to Current Use of Lands for Traditional Purposes (Section 11.4). The potential effects to land and marine use, as outlined above, are likely negligible to low. Additionally, the EAO predicts a low magnitude of effects to fish, negligible effects to traditional use plants, and negligible to low effects to wildlife from TMJ. The EAO did not predict and residual effects to fish in the MSA and predicted negligible to low residual effects to marine birds in the MSA. The EAO's recommended KMM under CEAA 2012 include:
    - Marine Access and Transportation Plan (KMM); and
    - Marine Communications Plan (KMM).

The EAO has concluded on the pathways of effects (noise, night time light, visual quality, air quality, and consumption of FSC resources) for Indigenous Health in other sections of this Report. These pathway effects are assessed in the Air Quality (Section 5.1), Vessel Wake (Section 5.4), Fish and Fish Habitat (Section 5.6), Vegetation (Section 5.8), Wildlife and Wildlife Habitat (Section 5.9), Human Health (Section 6.1), Noise (Section 6.2), Visual Quality (Section 8.3), and Current Use of Lands and Resources for Traditional Purposes (Section 11.4).

In consideration of the views of Indigenous Groups on the potential risk of accident or malfunction, real and/ or perceived health risks associated with air, noise, visual disturbance and consumption of country foods, knowledge transmission, cultural continuity, and cultural health, the EAO concludes that there would be a predicted residual effect to Indigenous health and well-being from TMJ, which is likely to interact with existing and foreseeable future projects. Considering the EAO's proposed provincial conditions and recommended KMMs under CEAA 2012, and the conclusions related to the VC's described above, the EAO concludes that residual and cumulative effects are unlikely to be significant for the Application scenario and BVS. The EAO acknowledges that views of Indigenous Groups and the assessment of impacts on knowledge transmission, cultural continuity and cultural health are discussed in Current Use (Section 11.4) and Part C sections of this Report.

11.3.5 CONCLUSION

The EAO has considered the above analysis, including the significance determinations for the pathways of effects above, proposed conditions in the TOC (which would become legally binding if an EAC is issued), and the recommended KMMs under CEAA 2012 (Appendix 1). The EAO is satisfied that TMJ is not likely to result in significant adverse residual or cumulative effects to the health and socio-economic conditions of Indigenous Groups due to changes to the environment from TMJ.

11.4 CURRENT USE OF LANDS AND RESOURCES FOR TRADITIONAL PURPOSES AND CULTURAL HERITAGE

This chapter assesses potential effects to the Current Use of Lands and Resources by Indigenous Peoples for Traditional Purposes ("Current Use") VC and as required under the CEAA 2012 Section 5(1)(c)(iii) (see Sections 9.2.3.3 and 9.3.1.3 of the Application). This chapter also assesses potential effects to Cultural Heritage[137] [a component of Section 5(1)(c), Section 11.2.3.3 of the Application].

In the assessment of effects to Current Use [CEAA 5(1)(c)(iii)] and Cultural Heritage [CEAA 5(1)(c)(ii)], the EAO considered the effects of potential TMJ induced changes to the environment on access to activities and sites, the availability and quality of harvested resources, and the quality of experience for fishing, hunting, trapping, and gathering. The EAO also considered potential TMJ-induced changes to other traditional and cultural uses of resources and the area. Effects on Aboriginal Interests and Treaty Rights are assessed for each individual Indigenous Group and for each category of rights in Part C of this Report.

This chapter does not include the evaluation of effects to commercial fishing and other economic opportunities related to commercial harvesting. These topics are addressed in the Land and Marine Resource Use chapter (Section 8.2) of this Report. Physical Heritage under Section 5(1)(c)(ii) of CEAA 2012 is assessed in Heritage Resources (Section 7.1) of this Report.

[137] The use of the lands and resources by Aboriginal peoples may have tangible values (e.g., wildlife species or traditional plants) and/ or intangible values (e.g., quiet enjoyment of the landscape or sites used for teachings). Intangible values are often linked with spiritual, artistic, aesthetic and educational elements that are often associated with the identity of Aboriginal groups (CEAA 2012 https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/technical-guidance-assessing-current-use-lands-resources-traditional-purposes-under-ceaa-2012.html).

11.4.1 BACKGROUND

Current Use and Cultural Heritage were identified for assessment due to their importance to Indigenous Groups and due to their regulatory importance under CEAA 2012. The Application assessed potential TMJ-related effects on Current Use and Cultural Heritage based on information from Indigenous Groups related to harvesting, the experience of land and aquatic use and sites, and landforms and natural features associated with cultural or spiritual use using the following four indicators:

- **Access to preferred locations** for harvesting marine resources including access to cultural, sacred and spiritual locations;
- **Availability of preferred resources** including abundance and distribution of wildlife, fish, marine and plant resources available for harvesting;
- **Quality of preferred resources** including changes in the real or perceived quality of traditional resources; and
- **Quality of experience** when accessing areas for current use including sensory experience (changes to noise, visual quality, and air quality).

The Application assessed the potential for effects to Current Use and Cultural Heritage based on both publicly available and confidential documents provided to TJLP (see Section 11.4.2.1 below). TJLP also considered the results of their engagement meetings with the Indigenous Groups in their summary of effects and conclusions on effects to Current Use.

The EAO acknowledges that Musqueam Indian Band has proven Aboriginal rights within their territory, which are protected under Section 35 of the *Constitution Act*, 1982.

The Tsawwassen First Nation have Treaty Rights recognized and affirmed by Section 35 of the *Constitution Act*, 1982. Tsawwassen First Nation entered into the Tsawwassen First Nation Final Agreement ("Tsawwassen Final Agreement") with Canada and B.C. which was negotiated under the BC Treaty Commission and came into effect on April 3, 2009. The Tsawwassen Final Agreement established a new government-to-government relationship based on mutual respect, providing the basis for reconciliation between Tsawwassen First Nation and the Crown. The Tsawwassen Final Agreement also sets out Tsawwassen First Nation rights to harvest wildlife, migratory birds, fish and aquatic plants for food, social, and ceremonial purposes within designated areas and Tsawwassen Territory.

Maa-nulth First Nations entered into the Maa-nulth First Nations Final Agreement (Maa-nulth Final Agreement), a modern comprehensive agreement concluded with Canada and B.C. under the BC Treaty Commission process that took effect April 1, 2011. The Final Agreement outlines the Section 35 rights of each of the five Maa-nulth First Nations, including the right to harvest

fish and aquatic plants (including intertidal bivalves), for FSC purposes in the Maa-nulth Domestic Fishing Areas. Maa-nulth First Nations are comprised of Huu-ay-aht First Nations, Ka:'yu:'k't'h'/Che:k'tles7et'h' First Nations, Toquaht Nation, Uchucklesaht Tribe, and Yuułuʔiłʔatḥ Government.

MARINE SHIPPING ASSESSMENT

TJLP assessed an expanded scope of potential effects of marine shipping on Current Use and Cultural Heritage. The PCs for the original Application area (that is, jetty to Sand Heads) were applied to the shipping route (see Boundaries, Section 11.4.1.2 below).

11.4.1.1 REGULATORY CONTEXT

Current Use is a factor identified under subsection 5(1)(c)(iii) of CEAA 2012 as project components and activities have the potential to adversely affect the current and future use of locations and resources that support traditional diets, social and spiritual life, governance and cultural transmission. Cultural heritage is identified under CEAA 2012 5(1)(c)(ii), and can also be related to the effects on Current Use noted above.

Other regulations pertinent to the understanding of the assessment of effects to Current Use are outlined in the Land and Marine Resource Use chapter (Section 8.2) of this Report.

11.4.1.2 BOUNDARIES

The LAA and the RAA for the original Application area (that is, jetty to Sand Heads) corresponded to the overlap of contributing VCs (such as Fish and Fish Habitat, Marine Mammals, Noise, Vegetation, Wildlife and Wildlife Habitat, Visual Quality, Heritage Resources, and Land and Marine Resource Use) with each Schedule B and Schedule C Indigenous Group's area of use for traditional purposes. Cumulative effects were assessed according to the LAA/ RAA boundaries for each Schedule B and Schedule C Indigenous Group. There is no single figure that illustrates the LAA and RAA since the assessment area for Current Use is unique for each Indigenous Group based in part on Indigenous Group traditional territories.

MARINE SHIPPING ASSESSMENT

Potential effects of TMJ-related shipping were assessed between the Sand Heads and the 12 nm limit (see Figure 2 in Section 2.2.3 of Part A). For the assessment of effects to Current Use, the MSA Local Study Area (LSA) and the MSA RSA corresponded to each Schedule B, Schedule C, and Schedule D Indigenous Group's asserted or established traditional territories, or otherwise defined areas used for traditional purposes. Cumulative effects were assessed according to the MSA LSA/ MSA RSA boundaries.

The MSA LSA and MSA RSA, as it pertains to each Indigenous Group's traditional territory, were outlined in the MSA where publicly available or provided by the Indigenous Group. There is no single figure that illustrates the MSA LSA and MSA RSA since the assessment area for Current Use is unique for each Indigenous Group based in part on Indigenous Group traditional territories.

11.4.2 POTENTIAL PROJECT EFFECTS AND PROPOSED MITIGATION MEASURES IN THE APPLICATION

11.4.2.1 BASELINE INFORMATION

TJLP reviewed TMJ-specific studies, traditional use and knowledge and other studies submitted by Indigenous Groups, TJLP's consultation records, treaty-related documents, legal decisions, and other relevant documents to determine existing conditions for the Current Use VC. TJLP assessed MSA-related effects to Current Use by augmenting TMJ-specific information with information submitted for the TMX EA and the federal RBT2 panel process and hearings. The following sections discuss both the original Application area (that is, jetty to Sand Heads) and the MSA.

The EAO notes that during Application review, Tsawwassen First Nation identified errors in the Application from misrepresented information relayed from Tsawwassen First Nation reports, inconsistencies with language from the Tsawwassen Final Agreement, and updated fisheries information and report references in both the Land and Marine Resource Use and Current Use sections of the Application. Tsawwassen First Nation drafted an erratum, which TJLP issued, to capture the corrected information.

The EAO added Snuneymuxw First Nation to Schedule B of the Section 11 order on January 19, 2022. The Application did not provide a summary of Snuneymuxw First Nation fishing and resource use practice; however, the EAO has reflected information provided by Snuneymuxw First Nation or information included in TJLP's BVSA in the summaries below.

Fishing

The Application noted that fishing for food, social, and ceremonial (FSC) purposes by Indigenous Groups is regulated and takes place during fisheries openings authorized by DFO. Indigenous fishers also fish under commercial and recreational fishing licences administered by DFO. Currently, members of Musqueam Indian Band hold DFO authorizations for FSC fisheries in the Fraser River near and within the TMJ site and have indicated that this is a preferred fishing location. Tsawwassen First Nation members have the right to fish within the Fraser River and

within the TMJ site, in the Tsawwassen Fishing Area[138] as outlined in the Tsawwassen First Nation Final Agreement. Tsleil-Waututh Nation holds DFO authorizations for FSC fisheries in the Fraser River and into the Salish Sea (i.e., approaches to the Fraser River), and have informed the EAO that Tsleil-Waututh people fish in the Fraser River and to the have intentions to fish there in the future. Tsleil-Waututh Nation also have access to fisheries in the Fraser River for traditional purposes through means other than FSC licences (e.g., through cultural protocols). Quw'utsun Nation[72] has informed the EAO that its member Indigenous Groups have intermittent, one-off DFO authorizations for FSC fishing within the Fraser River[139]; however, the EAO understands that Quw'utsun Nation is consulting with DFO on establishing a long term FSC licence for this area as they wish to re-establish regular fishing in the lower Fraser River.

In the BVSA, TJLP noted that they had not received information about locations for ongoing use of the Fraser River, FSC fishing, or other cultural uses from Snuneymuxw First Nation. The EAO understands that Snuneymuxw First Nation has interests in the lower Fraser River, including applying for fishing licences from DFO to fish more regularly in the area, and stewardship of fishing villages, land, and waters, which is captured in more detail in Part C of this Report. Snuneymuxw First Nation has identified that it has the right to fish as formerly since 1854 and that it has been denied access to its fishing grounds by DFO for generations. The EAO is aware that Snuneymuxw First Nation's former village site is located near the confluence of the Pitt and Fraser Rivers east of Barnston Island, and Snuneymuxw First Nation also used one or more seasonal fishing camps on Lulu Island (located across the river from TMJ's proposed marine terminal area). The EAO also understands that Snuneymuxw First Nation have and continue to use the southern Salish Sea between Nanaimo and the Lower Mainland for fishing and transportation to its fisheries in the Fraser River.

In addition to Snuneymuxw First Nation, Ts'uubaa-asatx Nation (formerly Lake Cowichan First Nation), and Squamish Nation, indicated their desire to fish within the Fraser River in the future. Kwantlen First Nation members continue to fish for FSC purposes in the Fraser River from north of the Pattullo Bridge up towards Mission These Indigenous Groups indicated that

[138] The Tsawwassen Fishing Area includes Boundary Bay, the lower reaches of the Fraser River, and roughly out to the "elbow" of the USA Canada marine border. This area is covered by the Original Application area and segments A-1 and A of the MSA area.

[139] Cowichan Nation Alliance informed the EAO that some of their communities had been authorized by DFO to fish the Fraser River in 2018 and 2019 on a one-off basis and that Quw'utsun Nation has resumed fishing in the South Arm of the Fraser River for FSC purposes as of week of August 15, 2022; Lyackson First Nation informed the EAO that it has the same constitutional right (and licenses) to fish the South Arm of the Fraser as the other Quw'utsun Nation communities.

their efforts to either fish, or continue to fish on a more regular basis in the Fraser River, are limited due to regulatory restrictions, including limited availability of FSC licences, short notices for openings, and short-duration openings for fisheries windows.

Katzie First Nation, Métis Nation B.C., Stó:lō Nation and Stó:lō Tribal Council[140], Indigenous Groups on Schedule C of the Section 11 Order, have indicated use, including fishing, in the Fraser River. Katzie First Nation reports that fishing occurs upstream of the Port Mann Bridge. Stó:lō communities report that fishing by Stó:lō members occurs in the Fraser River but not below the Port Mann Bridge. Métis Nation B.C. have indicated that land use mapping data shows Métis Nation B.C. use the TMJ area and shipping area for harvesting fish.

For the MSA area, TJLP provided contextual information regarding the known Current Use areas for each Schedule B and Schedule D Indigenous Groups. Tsawwassen First Nation members have the right to harvest intertidal bivalves in the MSA area, in the Tsawwassen Intertidal Bivalve Fishing Area[141] as outlined in the Tsawwassen First Nation Final Agreement. Tsleil-Waututh Nation reported that they obtain the bulk of their FSC crab from the Tsawwassen area, adjacent to Roberts Bank and the Tsawwassen Ferry Terminal. Musqueam Indian Band report a growing reliance on crab and prawn for FSC purposes, but also harvest other shellfish and invertebrate species from marine areas in the MSA area. The EAO understands that Snuneymuxw First Nation currently fish in the Salish Sea, primarily harvesting sockeye and halibut under FSC licences, and also rely on commercial fisheries and shellfish aquaculture.

According to the available information, all Indigenous Groups on Schedule D directly or indirectly use the Salish Sea and adjacent lands to undertake traditional fishing activities that represent their Current Use of the area. The MSA area overlaps with the southern portion of the Maa-nulth First Nations domestic fishing area, as outlined in the Maa-nulth First Nations Final Agreement [142], and Ditidaht and Pacheedaht First Nations' traditional territories. Ditidaht First Nation and Pacheedaht First Nation stressed the importance of Swiftsure Bank as a key fishing site and that they are concerned about effects to fishing from the shipping lanes as the lanes overlap Swiftsure Bank along its southern limits. In accordance with the Maa-nulth First

[140] The Stó:lō communities or Nations include: Aitchelitz Indian Band, Leq'a:mel First Nation, Matsqui First Nation, Popkum First Nation, Skawahlook First Nation, Skowkale First Nation, Shxwhá:y Village, Squiala First Nation, Sumas First Nation, Tzeachten First Nation and Yakweakwioose First Nation.

[141] The Tsawwassen Intertidal Bivalve Area is composed of the shores of Galiano, Mayne, Saturna, and Tumbo Islands which are within Segments A & B of the MSA area.

[142] https://www2.gov.bc.ca/gov/content/environment/natural-resource-stewardship/consulting-with-first-nations/first-nations-negotiations/first-nations-a-z-listing/maa-nulth-first-nations

Nations Treaty, Maa-nulth First Nations[143] has an allocation of Fraser River sockeye salmon that may be harvested within their domestic fishing area. Beyond the Maa-nulth Domestic Fishing Areas, Maa-nulth Harvesting of the Maa-nulth Fish Allocation for sockeye salmon may occur, as outlined in the Maa-nulth Fisheries Operational Guidelines, consistent with the Final Agreement, and in accordance with the Fraser Sockeye Salmon Workplan.

Hunting, Trapping, and Gathering

The Application did not identify any Current Use by Indigenous Groups of the TMJ site for hunting, trapping or gathering purposes. The EAO understands that the TMJ site does not contain any known plant gathering areas and, as TMJ is located on fee simple land where hunting and trapping activities are not permitted.

Tsawwassen First Nation's Wildlife and Migratory Bird Harvest Areas[144], as per the Tsawwassen Final Agreement, overlap the TMJ site. Kwantlen First Nation, Tsleil-Waututh Nation and Ts'uubaa-asatx Nation have identified their desire to regain or increase hunting, trapping and gathering activities in and along the Fraser River and nearby locations. The Maa-nulth First Nations have the right to harvest wildlife and migratory birds within the Wildlife Harvest Areas and Migratory Bird Harvest Areas as identified in the Maa-nulth Final Agreement. Two of the Maa-nulth Bird and Wildlife Harvest Areas are adjacent to, but do not overlap with, a small part of the MSA area.

The MSA identified hunting areas along the shipping route that were highlighted by Musqueam Indian Band, Quw'utsun Nation[72], Tsawout First Nation, Tsleil-Waututh Nation, and Tsartlip First Nation. The MSA noted that concerns regarding potential effects to the ability to access these areas to hunt waterfowl, as well as access to islands where deer are harvested were raised by these Indigenous Groups.

Other Traditional and Cultural Uses and Cultural Heritage

Indigenous Groups expressed an important historical connection to, and continued desired use of, known sites and places near the TMJ site and throughout the Salish Sea that are important for a range of cultural purposes including cultural continuity and revitalization.

[143] The Maa-nulth First Nations represents Huu-ay-aht First Nations, Ka:'yu:'k't'h'/Che:k'tles7et'h' First Nations, Toquaht Nation, Uchucklesaht Tribe, and the Ucluelet First Nation.

[144] Harvesting under the Tsawwassen Final Agreement is limited by measures necessary for conservation, public health, or public safety.

TMJ would be located across the Fraser River from a former Indigenous village site (approximately 300 m north of the TMJ site boundary, see Figure 20). The former Indigenous village site was identified by the Quw'utsun Nation, Tsawwassen First Nation, Kwantlen First Nation, Musqueam Indian Band, Tsleil-Waututh Nation, Ts'uubaa-asatx Nation, and Snuneymuxw First Nation as an important traditional resource gathering area (plant harvesting and fishing), a former habitation site, a boat landing place, and also a place of spiritual and cultural value.

The Tsawwassen Final Agreement identifies additional cultural and historic sites of significance to Tsawwassen First Nation to be designated as provincial heritage sites, including:

- *Skwəkwexwqən* or Poplar Island (identified as DhRr-000 or "not registered"), which is in the North Arm of the Fraser River; and
- *xwlic'əm* (identified as DgRs-35), which is located downstream of TMJ at Brunswick Point on Canoe Pass.

Some Indigenous Groups identified that there is an overlap between the MSA RSA and important cultural and scared sites; Indigenous Group-specific information can be found in Part C of this Report. Indigenous Groups also expressed the importance of annual long-distance canoe journeys in the MSA area, including crossing shipping lanes, to maintain and exchange cultures, identities, kinship, and inter-generational teachings.

Many Indigenous Groups stressed the importance of the SRKW as being a cultural keystone species critical for cultural continuity and transmission of culture to younger generations. The EAO understands that SRKW play an important role in the spiritual universe of some Indigenous Groups as evidenced in their depictions in visual art, stories, and songs, and in their role in depicting kin relations. Some Indigenous Groups describe the orca as their relatives. The EAO understands that many Indigenous Groups are concerned that TMJ could affect their sacred relationship with SRKW through acoustic effects to critical habitat and cumulative effects and that effects to SRKW populations could have effects on the balance of the ecosystem. The EAO's evaluation of biophysical effects to SRKW are included in the Marine Mammals chapter (Section 5.7) of this Report and informed the EAO's conclusions on effects to Other Traditional and Cultural Uses that contribute to Current Use outlined below.

11.4.2.2 POTENTIAL PROJECT EFFECTS

The Application evaluated potential adverse effects from construction and operations activities on Indigenous Current Use and Cultural Heritage. For the assessment on Current Use, the Application predicted no adverse residual effects on the availability of preferred resources,

quality of preferred resources, quality of current use experience when accessing areas for harvesting and cultural practices.

TJLP's BVSA considered how the increase in bunker vessel traffic would change TJLP's effects assessment compared to the Application. TJLP also considered additional information provided by Indigenous Groups subsequent to the Application submission and through ongoing consultation with Indigenous Groups on the proposed additional bunker vessel traffic.

Effects on Access to Fishing

TJLP found that there is potential for reduced access to fishing for Indigenous fishers during construction, operations and decommissioning, within and adjacent to the TMJ marine jetty area and due to TMJ-related vessels in transit. The Application found that reduced access to fishing would be due to transportation and marine shipping in the Fraser River and MSA, dredging activities, onshore construction and the approximately 20 ha marine safety zone[145], which would be in effect while TMJ-related vessels are at berth. FSC fishing on the Fraser River is regulated and takes place during fisheries openings authorized by DFO.

The Application noted that 14,336 vessels transited past the TMJ site from July 2010 – June 2011 (estimated traffic in 2018 was not expected to grow substantially). In 2022, TJLP provided updated vessel traffic predictions for the Southern Arm of the Fraser River. TJLP noted that TMJ-related LNG carriers could comprise up to an estimated 4.1 percent of all large vessel traffic and up to an estimated 5.2 percent for bunker vessel-sized vessel traffic transiting the Southern Arm of the Fraser River, for the Application scenario and BVS.

In the MSA, TJLP anticipates that TMJ-associated vessels in the MSA area would represent an increase of 0.5 percent in Segment A[146] (from a baseline of 49,717), a 0.2 percent increase in Segment B (from a baseline of 45,435), and a 1.1 percent increase in Segments C and D (from a baseline of 43,673) of the total vessel movements relative to existing conditions.

In the Application and MSA, TJLP concluded that after mitigations, including communicating TMJ-related vessel shipping schedules, potential effects to access to fishing sites in the Fraser River and MSA area would be negligible for all Indigenous Groups within Schedules B and D. In

[145] In the Application, TJLP proposed a "marine safety exclusion zone"/ "marine security zone". During Application review, TJLP proposed a revised, protocol-based approach to ensure public safety and a spatially defined zone is no longer proposed by TJLP. Please refer to Section 8.2.3 and Section 9.3 of this Report for more details. The term "marine safety exclusion zone" is used in Section 11.4.2 of this Report, consistent with the Application.

[146] Please see Figure 15 in the Land and Marine Use Section 8.2 of this Report for the MSA area segments.

concluding this, TJLP noted that Indigenous fishers would consider the restrictions within the shipping lanes in their decisions on where to fish. TJLP concluded that given the relatively low frequency of regular TMJ-related vessel transits, interactions with Indigenous fishers would be infrequent.

In the Application, TJLP concluded that that access effects could be experienced by Musqueam Indian Band and Tsawwassen First Nation. TJLP concluded there would be no interaction for other Schedule B Indigenous Groups in the TMJ area. After mitigations including communicating TMJ-related vessel shipping schedules, potential effects to access to fishing sites in the Fraser River would be low in magnitude for Musqueam Indian Band and Tsawwassen.

In the MSA, TJLP concluded that area would be negligible for all Indigenous Groups within Schedules B and D. In concluding this, TJLP noted that Indigenous fishers would consider the restrictions within the shipping lanes in their decisions on where to fish. TJLP concluded that given the relatively low frequency of TMJ-related vessel transits, interactions with Indigenous fishers would be infrequent. TJLP noted in the MSA that the public record for TMX and RBT2 indicated that Esquimalt First Nation, Scia'new First Nation, and T'Sou-ke First Nation had requested that their information not be reproduced for subsequent assessments. As well, the MSA noted that Malahat Nation did not make information available to TJLP to assess access to Current Use locations. As such, TJLP did not complete an assessment of effects to access for these Indigenous Groups.

Bunker Vessel Scenario

In the BVSA, TJLP stated that although a greater number of vessels would call to TMJ compared to what was assessed in the Application, the bunker vessels would not require the same amount of time to berth and deberth. The bunker vessels would be self-propelled and more maneuverable resulting in less time obstructing the navigational channel and other portions of the river. As the potential interaction with Indigenous vessel access and use around the TMJ site would occur more frequently, but for shorter periods of time compared to the scenario presented in the Application, TJLP concluded effects from additional bunker vessel traffic are expected to be consistent with the findings of the Application.

Further, TJLP noted that because bunker vessels are smaller and more maneuverable than LNG carriers, the bunker vessels would therefore be associated with comparably fewer safety concerns due to the smaller size of the bunker vessels and reduced spatial and temporal disruption to Indigenous fishing vessels.

As assessed in the BVSA, the overall number of vessel movements for the BVS would increase to an average of one vessel call to TMJ per day (or two vessel movements each day) and the potential for Indigenous FSC harvesters to remove their nets to allow TMJ-related vessels to transit through the shipping lane may increase from what was assessed in the Application. While this increases the likelihood of a FSC harvester being required to move nets to allow for TMJ-related vessel to transit through the shipping lane, as required under the Collision Regulations, TJLP stated that this would only occur during FSC harvesting openings. TJLP pointed to the implementation of the proposed new mitigation measure (see Section 11.4.2.3 below) to synchronize movement of bunker vessels with existing marine traffic including Indigenous fishers is expected to reduce the frequency of this interaction. TJLP noted that bunker vessels have more flexibility in their movement schedule relative to the larger LNG carriers, as they are not reliant on tidal cycles and that there would be fewer accompanying vessels as no tug assist would be required for the bunker vessels. TJLP concluded that the residual effect would be throughout the operational phase of TMJ, continuous as it could occur more than once per week during FSC harvesting periods, and reversible. TJLP concluded that the residual effects has a high likelihood of occurring due to the daily potential for interaction. TJLP noted the interaction is already occurring in the highly industrialized lower Fraser River where vessels regularly transit through the shipping lanes and concluded the residual effects are not significant. TJLP concluded that TMJ would result in low magnitude residual effects on Current Use for those Indigenous Groups who fish in and around the TMJ site (i.e., Musqueam, Tsawwassen, Quw'utsun Nation, and Tsleil-Waututh Nation).

Based on the assessment of the Fish and Fish Habitat VC in the BVSA, TMJ concluded that TMJ activities associated with the increased bunker vessel traffic are not anticipated to result in changes to the availability of preferred resources for FSC fishing.

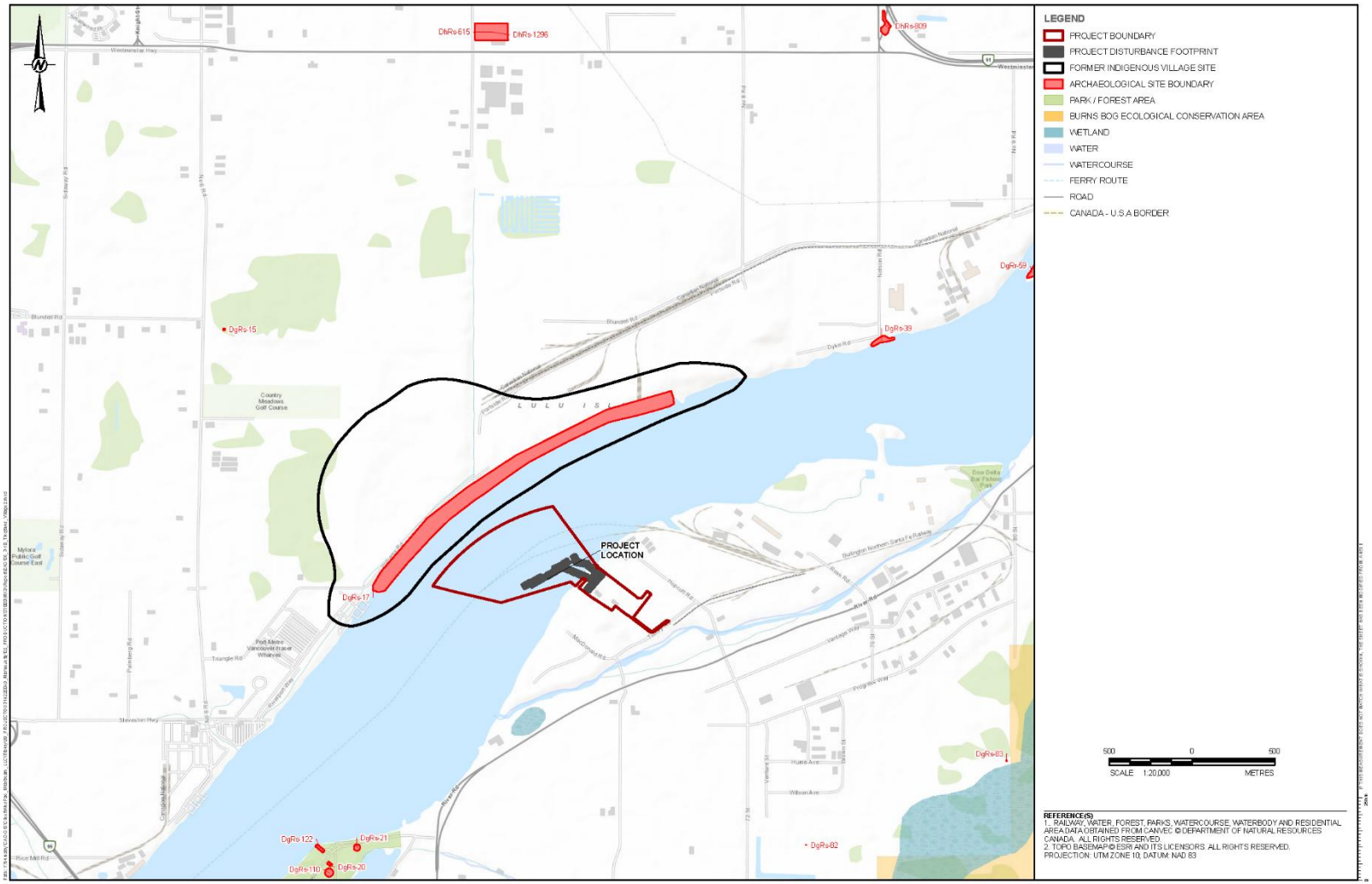

Figure 20: Location of the former Indigenous Tl'uqtinus Village Site.

Effects on Access to Hunting, Trapping, and Gathering Practices

In the Application, TJLP found that TMJ would result in loss of habitat and vegetation, sensory disturbance to wildlife, and possible bird mortality from clearing or indirectly by strikes with infrastructure at the TMJ site. In the MSA, TJLP found that TMJ-related vessels could result in possible mortality of birds due to collisions with vessels in the MSA area. TJLP also found that there would be no change to access of plant harvesting due to TMJ given that the TMJ site is privately owned. TJLP predicted that, with mitigation measures in place, there would not be residual effects to preferred wildlife, access to hunting, trapping or gathering sites, or the experience of hunting, trapping and gathering in the Fraser River or MSA area.

In the BVSA TJLP did not predict an interaction with the increased bunker vessel traffic; therefore, did not assess changes as part of the BVSA.

Effects to Other Cultural and Traditional Uses and Cultural Heritage

TJLP reported that the Schedule B Indigenous Groups indicated concerns related to TMJ and potential effects on their current or future use of the area. Schedule B Indigenous Groups identified the areas adjacent to the TMJ site as being important for knowledge transfer and teaching. Further, Musqueam Indian Band, Tsawwassen First Nation, Tsleil-Waututh Nation, Quw'utsun Nation, and Kwantlen First Nation and identified the TMJ site as important for cultural continuity, heritage and archaeological resources either in the past (and desired future) or present day.

The Application stated that Musqueam Indian Band, Tsawwassen First Nation, Ts'uubaa-asatx Nation, Tsleil-Waututh First Nation, Squamish First Nation, Lyackson First Nation, and Kwantlen First Nation raised concerns that development in their territories and throughout the Salish Sea was impeding their cultural continuity and their efforts at revitalizing cultural practices.

TJLP concluded that TMJ-related activities would not affect access to locations for cultural, sacred and spiritual locations in the Fraser River or MSA area, such as the former Indigenous village site across the Fraser from the TMJ site. TJLP concluded that, based on the current visual quality surrounding the TMJ site, effects to visual quality are anticipated to be minimally disruptive for Indigenous users. TJLP concluded that after the application of mitigations measures, the residual effects on noise and visual quality would be negligible.

In the MSA application, TJLP assessed potential TMJ effects in relation to Current Use [CEAA Section 5(1)(c)(iii)] and no effects were identified for the following: changes in availability or resources and change in quality of Current Use experience. In the MSA, TJLP described the following interactions: TMJ associated shipping activities, including wake, could temporarily

displace and affect Current Use areas and access to preferred resources; and not significant residual effects were identified for marine mammals, resulting in a potential change in availability of a preferred resource for Current Use including concern for species of cultural importance to Indigenous Groups. TJLP assessed potential effects to (C)A 5(1)(c)(ii) in the following manner: physical heritage was assessed in the Heritage Resources section; and cultural heritage was assessed in the Current Use chapter. TJLP did not specifically assess canoe journeys and potential effects on intangible cultural heritage associated with SRKW; however, the EAO considers potential effects later in this chapter.

In the BVSA, TJLP concluded that predicted changes to air quality, noise, and visual quality due to increased bunker vessel traffic is either unchanged, lower, or negligible compared to the Application. Based on the assessment of the Marine Mammals VC in the BVSA, TJLP concluded that TMJ activities associated with the increased bunker vessel traffic are not anticipated to result in changes to marine mammals that are of cultural importance to Indigenous Groups.

11.4.2.3 MITIGATION MEASURES PROPOSED IN THE APPLICATION AND MSA

Based on their assessment of effects to Current Use, TJLP developed mitigations to address potential effects to fishing and traditional and cultural use in the original Application area (that is, jetty to Sand Heads) and the MSA areas under the following:

- Marine Access and Transportation Plan at the TMJ site: Outlines construction and operational activities and procedures, to maintain commercial and non-commercial vessel navigation passage;
- Marine Communication Plan: Meets TC Navigation Protection Program requirements; and
- Implementation of the recommendations under the TMJ Tilbury LNG Cargo Loading and Marine Transit Risk Assessment (Appendix 1.0-1 of the Application): Identifies potential emergency response scenarios that would reduce the likelihood of effects to Current Use (i.e., LNG release due to LNG carrier grounding, allision or collision).

TJLP identified additional mitigations, outlined in Sections 4 through 9 of the Application, that would reduce effects of noise, project lighting, and project emissions on biophysical, heritage, and experiential components of Current Use.

In the BVSA, TJLP proposed a new mitigation measure to synchronize bunker vessel traffic with existing vessel traffic during fishing FSC openings to manage effects of more frequent interruptions to FSC fishing. During fishing openings, TJLP propose that bunker vessel arrivals and departures would be synchronized with existing traffic (subject to minimum separation), reducing the potential frequency that Indigenous fishers would be required to move or retract

their nets. If a synchronized passage results in an Indigenous fisher being required to move or retract their nets, the time of the disruption due to the bunker vessel movement would be extended by approximately 5 minutes depending on minimum separation between vessels and speed on the water to pass by.

11.4.3 POTENTIAL PROJECT EFFECTS AND PROPOSED MITIGATIONS IDENTIFIED DURING APPLICATION REVIEW

During Application review, the following key issues related to the assessment of Current Use [CEAA 5(1)(c)(iii)] and Cultural Heritage [CEAA 5(1)(c)(ii)] for TMJ were identified based on feedback from Indigenous Groups:

- Access and experience for indigenous fishers;
- Effects to fish;
- Effects to cultural sites and cultural heritage;
- Publicly available information in the Marine Shipping Assessment;
- Bunker Vessel Scenario; and
- Cumulative effects.

ACCESS AND EXPERIENCE FOR INDIGENOUS FISHERS

Musqueam Indian Band, Tsawwassen First Nation, Quw'utsun Nation, Tsleil-Waututh Nation have emphasized the importance of the continued use of the Fraser River, including the TMJ site, for navigation and fishing activities and have expressed concern that TMJ would affect their ability to access preferred locations for fishing and to travel routes. Indigenous Groups have expressed their concerns regarding TMJ-related effects including increased noise levels, changes to visual quality, and perceived or actual shipping-related safety risks on the quality of experience for Indigenous Groups when accessing areas for Current Use. During the BVS review, Indigenous Groups include raised concerns that increased bunker vessel traffic would further affect access and experience for Indigenous fishers.

Tsawwassen First Nation stressed the importance of the Final Agreement and a need to protect their treaty rights from TMJ-related effects. Tsawwassen First Nation raised strong concerns about potential effects to their fishers from large vessels interfering with access to fishing areas during fish openings in the Fraser River and elsewhere. Tsawwassen First Nation informed the EAO that TMJ activities would directly overlap and interact with areas that are crucial and irreplaceable for Tsawwassen First Nation harvesting.

Musqueam Indian Band, Quw'utsun Nation, Pacheedaht First Nation, and Tsleil-Waututh Nation also raised strong concerns about the potential for TMJ-related vessels to interrupt their fishers. These same Indigenous Groups advised the EAO that should TMJ-related shipping interruptions occur during high yield fishing opportunities (for example, a large run of salmon during a time limited DFO authorized fisheries opening) that requires the removal of gear for safety reasons, the effect to the community would be high. Cowichan Nation Alliance expressed concern that further development of the foreshore in the lower Fraser River would affect their intent to re-establish shore-based fishing in the area.

Musqueam Indian Band noted that TMJ is a preferred fishing area for Musqueam Indian Band fishers and expressed concern that the "marine safety zone" could block Musqueam Indian Band navigation and fishing activities in the area. They also noted that the quality of their fishing experience includes a sense of 'peacefulness' that would be disturbed by construction and operations activities. Musqueam Indian Band and Cowichan Nation Alliance also raised concerns that the berthing of LNG carriers and the related marine safety zone could affect navigation and marine user access.

During their review of the EAO's draft Assessment Report, Musqueam Indian Band, Tsleil-Waututh Nation, Tsawwassen First Nation, Pacheedaht First Nation, and Cowichan Nation Alliance asserted that TMJ effects would constitute a serious effect to their access to fishing sites and fishing experience.

In lieu of a marine safety zone, TJLP has proposed a revised, protocol-based approach to provide for public safety and reduce the potential for interference with navigation. The proposed Marine Safety Protocol would come into effect during construction and remain in place for the life of TMJ. The EAO understands that mariners may enter or pass through the marine terminal area and TJLP have operational measures in place for public safety. For the purposes of the EA, the EAO has assumed that mariners would avoid entering and remaining in the marine terminal area due to the warning signs and notifications regarding elevated public risk due to LNG vessel berthing, loading and de-berthing activities. Refer to Section 8.2.3 of this Report for more details.

In response to Indigenous Group concerns regarding access to fishing, the EAO recommends a KMM under CEAA 2012 for a Marine Access and Transportation Plan in the lower Fraser River which would include mitigations to reduce disruptions, caused by construction and operations, for commercial and non-commercial marine use. TJLP would also be required to identify, in consultation with Indigenous Groups and DFO via publicly accessible information on recently issued DFO licences, fishing licences and other Indigenous traditional uses. TJLP would also be required to develop measures to mitigate effects on Indigenous traditional use activities,

including LNG carrier call scheduling that accounts for and attempts to reduce LNG carrier calls during the anticipated timing window for Indigenous fishers operating under DFO fishing licences. TJLP would also synchronize bunker vessels arrivals at and departures from the jetty with regularly scheduled marine traffic (not associated with TMJ) when Indigenous fishers are operating under DFO fishing licences. TJLP would be required to provide opportunities to Indigenous Monitors to participate in monitoring during FSC fisheries windows to determine the effectiveness of the mitigation. The Marine Access and Transportation KMM includes a follow-up program pertaining to adverse effects on Current Use of Lands and Resources for Traditional Purposes. The EAO recommends a Marine Communication Plan as a KMM under CEAA 2012 which would identify the procedures to notify Indigenous Groups and other marine users of planned activities associated with TMJ as well as a means by which Indigenous Groups and other marine users can provide feedback to TMJ on adverse effects related to navigation as a result of TMJ activities. The EAO also recommends a KMM under CEAA 2012 that, in each calendar year, TMJ would receive a maximum of 365 LNG vessel calls, of which a maximum of 68 would be LNG carrier calls. In response to Indigenous Groups' concerns regarding the effects of noise and visual quality on the quality of experience, the EAO is proposing provincial conditions and recommending KMMs under CEAA 2012 for noise and vibration management (Chapter 6.2 of this Report), lighting management (Chapter 8.3 of this Report).

EFFECTS TO FISH

Indigenous Groups, including Tsawwassen First Nation, Musqueam Indian Band, Tsleil-Waututh Nation, Quw'utsun Nation, Ts'uubaa-asatx Nation, Pauquachin First Nation, Pacheedaht First Nation, T'Sou-ke First Nation, Ditidaht First Nation, and Maa-nulth First Nations identified traditionally and culturally important food fish that were, and in some cases are currently, fished in the Salish Sea and the South Arm of the Fraser River. The species that were consistently raised were salmon (all five pacific species), sturgeon, and eulachon.

Tsawwassen First Nation commented that eulachon was not included in TJLP's assessment of effects and identified eulachon and sturgeon as species of concern and of importance to Tsawwassen First Nation. Tsawwassen First Nation has commented that the existing levels of eulachon and sturgeon are insufficient to be able to fish in their preferred manner. This is considered further in Part C of this Report.

Tsleil-Waututh Nation commented that, as with sockeye and chinook, there are no alternative sources of eulachon and sturgeon within Tsleil-Waututh territory besides the lower Fraser River area. Tsleil-Waututh Nation expressed that they seek to increase access to eulachon and sturgeon and would harvest eulachon and sturgeon in the South Arm of the Fraser River if eulachon and sturgeon populations increased to levels allowing a sustainable harvest. Tsleil-

Wauthuth Nations stated that community members are unable to access the desired amount of local, traditional food.

More information on potential effects to fish and fish habitat including issues raised by Indigenous Groups regarding the effects assessment can be found in the Fish and Fish Habitat (Section 5.6) section of this Report, which concluded non-significant effects to fish and fish habitat. The EAO has considered concerns about preferred fish species and linkages to Aboriginal and Treaty rights in Part C of this Report. The EAO recommends KMMs under CEAA 2012 as described in Fish and Fish Habitat (Section 5.6) section of this Report, including: Fish Mitigations to Reduce Harm and Mortality; a Fish Habitat Offset Plan; and conditions and key mitigations outlined in the River Processes (Section 5.3) and Water Quality (Section 5.5) sections of this Report.

EFFECTS TO CULTURAL SITES AND CULTURAL HERITAGE

Several Indigenous Groups expressed concerns that TMJ could adversely affect users of the former Indigenous village site. Musqueam Indian Band, Tsawwassen First Nation, and the Cowichan Nation Alliance raised concerns about potential TMJ effects, including light and noise, to their enjoyment of Tilbury Island and the South Arm of the Fraser River. Cowichan Nation Alliance expressed that the former Indigenous village site would be particularly affected by visual and auditory disruptions due to its proximity to the TMJ site. Tsleil-Waututh Nation expressed that potential interruptions to access to heritage resources in the TMJ-area would be significant due to increasing vessel transits and the distance from TMJ to the known heritage resources. Tsawwassen First Nation commented that the regular visual and physical presence of large LNG vessels would affect the experience of visiting sites of importance to Tsawwassen First Nation. These effects would occur regardless of whether the vessels made physical contact with the sites.

The EAO assessed visual quality and acoustic effects (in Section 8.3 and Section 6.2 of this Report, respectively) and these conclusions are considered in the EAO's assessment of effects to Current Use (see Section 11.4.1 below). Effects to access to cultural sites are also evaluated below.

The EAO heard concerns from Musqueam Indian Band about the EAO's characterization of Aboriginal rights and title related to the village site in the draft assessment report for TMJ. To address these concerns, Musqueam Indian Band requested that the EAO include more information to appropriately contextualize claims and a deeper understanding of the familial ties and protocols that govern access to ƛ̓əqtinəs as provided in Musqueam's 2018 Knowledge

and Use Study (KUS) study[147]. More information about the potential impacts of TMJ on Musqueam Indian Band's cultural continuity and sense of place and identity can be found in Section 14.5.3 of Part C.

The EAO understands, through the TMJ EA and through the RBT2 panel process, that a number of Indigenous Groups have cultural interests in SRKW and have expressed concern that the cumulative effects of shipping within the Salish Sea would result in significant adverse residual effects on SRKW, including acoustic disturbance, vessel strikes and catastrophic accidents, combined with cumulative effects. Indigenous Groups that raised concerns about effects to SRKW relating to cultural and spiritual practices include: Musqueam Indian Band, Tsleil-Waututh Nation; Tsawwassen First Nation; Quw'utsun Nation; Snuneymuxw First Nation, Kwantlen First Nation; Malahat Nation; Pacheedaht First Nation; Ditidaht First Nation; Pauquachin First Nation; Esquimalt First Nation; Tsawout First Nation; T'Sou-ke First Nation; Maa-nulth First Nations; Tsartlip First Nation; Tseycum First Nation; Songhees First Nation; and Scia'new First Nation.

A number of Indigenous Groups have indicated that they conduct canoe journeys for cultural purposes in the MSA area and feel that additional shipping would cause adverse effects to these practices, in particular due to potential safety concerns while travelling traditional routes and crossing shipping lanes. Indigenous Groups that have indicated their concern about potential effects to canoe journeys as a result of TMJ-related shipping include: Malahat Nation; Musqueam Indian Band; Ditidaht First Nation; T'Sou-ke First Nation; Scia'new First Nation; Cowichan Nation Alliance; Pacheedaht First Nation; Pauquachin First Nation; and Tsartlip First Nation.

Indigenous Groups commented that effects to access to cultural and spiritual sites, experience and effects to cultural resources, including SRKW, could result in reduced opportunities for cultural transmission including Indigenous language acquisition by younger generations. Overall, the EAO has heard from Indigenous Groups about potential unmitigable effects to cultural uses in the original Application area and the MSA. Musqueam Indian Band expressed concerns that their cultural continuity and sense of place and identity would be affected by several aspects of TMJ. Tsleil-Waututh Nation expressed deep concerns about the effects of TMJ-related shipping to Tsleil-Waututh Nation cultural health and intangible cultural heritage, and the effect on the ability to undertake traditional cultural practices in spiritually significant

[147] Musqueam Indian Band. 2018. Musqueam Indian Band Knowledge and Use Study for WesPac Midstream's Proposed LNG Marine Jetty Project.

areas and sacred tunnels; in particular, effects on the cultural landscape in the Tsawwassen and Roberts Bank area[148]. Tsleil-Waututh noted irreversible impacts to cultural health and intangible cultural heritage for the duration of TMJ operations, and expressed that there are existing significant cumulative effects to intangible cultural heritage, and that TMJ-related vessels would contribute to existing cumulative effects.

PUBLICLY AVAILABLE INFORMATION IN THE MARINE SHIPPING ASSESSMENT

Tsawwassen First Nation, Tsleil-Waututh Nation, Musqueam Indian Band, Halalt First Nation, and Pauquachin First Nation raised concerns about the reliance on information from RBT2 and TMX to understand baseline conditions in the MSA. The EAO notes that the MSA information request required the TJLP to use information from the TMX and RBT2 projects and complement it with additional information from the RBT2 panel hearings and any information provided by Indigenous Groups. TMX and RBT2 are recent EA projects in the region that have considered marine shipping in the Salish Sea and Strait of Juan de Fuca. They include substantial baseline information on existing environmental and human environmental conditions along B.C.'s south coast and completed assessments, including a review of regional cumulative effects associated with shipping.

With respect to applying Current Use information provided by Indigenous Groups for the TMX and RBT2 MSAs to the TMJ MSA, the EAO is of the opinion that publicly available information provided by Indigenous Groups for the assessment of shipping effects in the Salish Sea is relevant to the assessment of TMJ shipping effects. The EAO also heard from Musqueam Indian Band regarding their concerns that the spatial and temporal limitations of the underlying data in the MSA would result in the EAO underestimating the potential impact of TMJ on Musqueam's current use of lands and resources. The EAO understands that Musqueam Indian Band considered that the MSA relied heavily on data gathered in the regional study area of the 2017 Knowledge and Use Study for RBT2 Project. Please see Section 13.2.1 for more details related to concerns raised by Indigenous Groups related to the EAO's reliance on information from RBT2 and TMX in its assessment of TMJ.

BUNKER VESSEL SCENARIO

During the BVS review, the EAO heard from Indigenous Groups, including Tsawwassen First Nation and Tsleil-Waututh Nation, that the increase in annual vessel calls from 137 to 365 was

[148] For more details, please refer to Tsleil-Waututh Nation's assessment of effects on Aboriginal Interests in Part C, authored by Tsleil-Waututh Nation.

substantial that any additional vessel traffic would impact their marine area use and access and experience, including fishing and cultural practices. Tsleil-Waututh Nation expressed that there are already high impacts from existing vessel traffic and these intense cumulative impacts in the lower Fraser affect Tsleil-Waututh Nation members' ability to fish and engage in cultural activities. Snuneymuxw First Nation expressed that the frequency of vessel interruption is more invasive and disturbing to the exercise of harvesting rights than the size of the interrupting vessel.

TJLP has proposed synchronizing TJLP-related LNG bunker vessel movements with existing traffic on the Fraser River during FSC fishing openings. TJLP proposed this new mitigation measure to reduce the frequency of interruptions (e.g. the number of times that nets must be moved or retracted and reset) thereby reducing effects to the critical limited FSC fishing openings. TJLP would work with other users of the Fraser River, such as cargo ferries that have scheduled transits between TMJ and Sand Heads, to make arrangements to coordinate vessel movements with these existing, regular transits. TJLP noted that collaboration with the nearby marine terminals would facilitate concurrent departure and vessel synchronization. Based on the minimum separation distance, and accounting for the length and average speed, TJLP estimates that it would take less than five minutes for a synchronized bunker vessel to pass a fixed point on the Fraser River. TJLP noted that they would have standard terms and conditions of service which would be incorporated into the agreements with its customers, and that TJLP would impose scheduling and traffic coordination restrictions in those contracts. Under those contractual provisions, TJLP would be entitled to refuse to provide service to vessels under certain circumstances. This is the contractual provision TJLP would employ to require bunker vessel operators to participate in communication with TJLP and coordinate their movements with other traffic during FSC openings. TJLP's customers would be responsible for arranging LNG bunker vessels to call at the TMJ and for LNG to be delivered to the TMJ from the adjacent LNG facility.

Tsleil-Waututh Nation expressed that while the proposed mitigation measure is a start, it is insufficient in addressing the issue. Tsleil-Waututh Nation noted that synchronizing of bunker vessel traffic with existing traffic during affected FSC openings does not address the impacts Tsleil-Waututh Nation's constitutional rights to hunt and fish in all their traditional territory and consultation area or on other cultural activities for Tsleil-Waututh Nation. Tsawwassen First Nation questioned whether and to what extent these vessel schedules would accommodate the community's preferred means of exercising their rights and expressed that mitigation of synchronizing bunker vessel traffic remains uncertain, especially given the existing high traffic volume on the Fraser River. Tsawwassen First Nation stated that TJLP have not demonstrated that the proposed synchronization would avoid other non-temporal impacts to Tsawwassen's

rights, such as diminished senses of place and safety, and that it is unclear to Tsawwassen First Nation whether and to what degree synchronization would be achievable in practice. Kwantlen First Nation and Ts'uubaa-asatx Nation expressed that while it was good to see additional measures being proposed, they are also uncertain about the effectiveness of the mitigation measure in practice.

The EAO understands the perspectives from Indigenous Groups about cumulative effects and that additional vessel traffic would aversely effect fishing and cultural practices. The EAO has recommended a new Cultural Heritage KMM, which would require TJLP to develop nation-specific measures to address the effects on tangible and intangible cultural losses caused by the construction and operation of TMJ, in consultation with those Indigenous Groups experiencing effects, as described in this Report. As part of the measures, TJLP would be required to consider developing or contributing to Indigenous-led programs to preserve and enhance cultural heritage.

Also, as part of the recommended Marine Access and Transportation Plan KMM, the EAO has recommended additional mitigation measures based on the BVS. TJLP would be required to identify, in consultation with Indigenous Groups and DFO via any publicly accessible information on recently issued DFO licences, fishing licences and other Indigenous traditional uses. TJLP would also be required to develop measures to mitigate effects on Indigenous traditional use activities, including LNG carrier call scheduling that accounts for and attempts to reduce LNG carrier calls during the anticipated timing window for Indigenous fishers operating under DFO fishing licences. TJLP would also synchronize bunker vessels arrivals at and departures from the jetty with regularly scheduled marine traffic (not associated with TMJ) when Indigenous fishers are operating under DFO fishing licences. TJLP would be required to provide opportunities for Indigenous Monitors to participate in monitoring during FSC fisheries windows to determine the effectiveness of the mitigation. The Marine Access and Transportation KMM includes a follow-up program pertaining to adverse effects on Current Use of Lands and Resources for Traditional Purposes. The EAO acknowledges that synchronizing bunker vessel traffic with existing traffic does not completely mitigate effects, including impacts on FSC openings and other cultural activities.

CUMULATIVE EFFECTS

Indigenous Group concerns regarding cumulative effects, as well as the EAO's assessment of cumulative effects on Current Use and Cultural Heritage, can be found in Section 11.4.5 below.

11.4.4 THE EAO'S ANALYSIS AND CONCLUSIONS

This section presents the EAO's conclusions on the potential adverse residual effects from TMJ, for the Application scenario and BVS, on:

- The Current Use VC: Including fishing, hunting trapping, gathering and other traditional and cultural uses of the area;
- CEAA 2012 (5)(1)(c)(iii): Changes to the environment on the current use of lands and resources for traditional purposes by Indigenous peoples; and
- CEAA 2012 5(1)(c)(ii): Cultural Heritage.

The EAO evaluated the potential residual effects to the above by considering construction, operations and decommissioning activities that could affect access to current use activities and sites, the availability and quality of current use resources, the quality of the experience of current use activities (fishing, hunting, trapping, and gathering) and effects on other cultural and traditional uses and Cultural Heritage. The criteria and assessment ratings used to evaluate the residual effects are defined in Appendix 5: Residual Effects Characterization Definitions. Effects on Aboriginal Interests and Treaty Rights are assessed for each individual Indigenous Group and for each category of rights in Part C – Effects to Aboriginal Interests and Treaty Rights of Indigenous Groups – of this Report.

Proposed Provincial Conditions and Key Mitigation Measures (CEAA 2012)

Based on mitigations proposed in the Application and BVSA, and issues raised during Application review, the EAO proposes the following provincial conditions and recommended KMMs under CEAA 2012:

- To mitigate effects to the quality of experience of current use and cultural heritage activities:
    - Condition 17: Indigenous Cultural Awareness, Recognition and Mitigation (provincial condition);

  - Condition 10: Construction Environmental Management Plan and Condition 11: Operations Environmental Management Plan for noise, air quality and lighting management (provincial conditions);
  - Condition 19: Air Quality Management Plan (provincial condition) and Air Quality Management Plan (KMM) with best management practices to mitigate effects to air quality; and
  - Condition 20: Greenhouse Gas Reduction Plan (provincial condition).
- To mitigate effects to access to current use and cultural heritage activities and sites:
  - Marine Access and Transportation Plan (KMM);
  - Marine Communications Plan (KMM);
  - Cultural Heritage (KMM);
  - KMM recommending that in each calendar year TMJ would receive a maximum of 365 LNG vessel calls, of which a maximum of 68 would be LNG carrier calls; and
  - KMM recommending that TJLP identify how they are participating in the identification and implementation of regional initiatives related to effects on current use of lands and resources for traditional purposes as a result of marine shipping (KMM).

- To mitigate effects to Current Use [CEAA 5(1)(c)(iii)] CEAA 5(1)(c)(ii)]:
  - See KMMs outlined in Section 5.5 (Water Quality), Section 5.6 (Fish and Fish Habitat), Section 5.7 (Marine Mammals), Section 5.8 (Vegetation) and Section 5.9 (Wildlife) of this Report.

Residual Effects

The EAO predicts negligible to no residual effects to hunting, trapping and gathering at the TMJ site because TMJ is on private land, where resources are limited/ unavailable, and therefore unlikely to further the effects to harvestable resources. The EAO predicts that TMJ-related shipping activities, including vessel wake, noise, visual presence would have no measurable effect on terrestrial or marine-based hunting, trapping and gathering.

After considering the proposed mitigation measures, the EAO predicts that TMJ (both the Application scenario and BVS) would result in the residual adverse effects to:

- Current Use [CEAA 5(1)(c)(iii)] for fishing, through effects to fish, access to fishing areas and the experience of fishing; and
- Current Use for other Traditional and Cultural Uses [CEAA 5(1)(c)(iii)] and Cultural Heritage [CEAA 5(1)(c)(ii)] through access, quality of experience and, in the case of cultural interests in SRKW, through the resource itself.

Current Use for Fishing

Fish and Fish Habitat: The EAO predicts that construction (over approximately three years) and operations (annual dredging) are likely to result in low magnitude changes to fish habitat and low magnitude potential behavioural changes to fish species at the TMJ site. The EAO predicts low magnitude and infrequent to continuous effects to sturgeon from vessels strikes. The EAO does not predict any residual effects to fish and fish habitat in the MSA area. Please see the EAO's conclusions on potential adverse residual effects in Fish and Fish Habitat (Section 5.6 of this Report) for further details.

Access to Fishing: The EAO concludes that TMJ would have potential residual effects to access to fishing for Indigenous Groups that currently fish or that have future intentions to fish near or within the TMJ site. Access to the TMJ site would be affected during construction through operations when vessels are berthing, loading and de-berthing, as outlined in TJLP's Marine Safety Protocol. For the purpose of the EA, the EAO has assumed that mariners would avoid entering and remaining in the marine terminal area due to the warning signs and notifications regarding elevated public risk due to LNG berthing, loading and de-berthing activities (on average, daily in the BVS). TMJ-related vessels in transit could affect Indigenous Groups who fish in, or in proximity, to the navigational channel or shipping lanes, or those who need to cross these areas to access fishing resources. TMJ-related vessels would transit through the Salish Sea and Fraser River. For the BVS, on average, one vessel call on the jetty every day (i.e., two vessel movements a day). At the scale of the LAA and RAA, the EAO predicts the effects to access within the TMJ site would be a low magnitude effect. Effects to access from vessels in transit are predicted to be low in magnitude compared baseline levels. Under the Application scenario and BVS, TMJ would increase vessel traffic in the Fraser River by up to 1.5 percent and up to 4 percent, respectively. In the MSA area, TMJ would increase vessel traffic by between 0.2 percent and 1.1 percent, depending on the segment of shipping lane. The EAO heard from Indigenous Groups and DFO that some of the DFO-regulated FSC fisheries windows in the Fraser River are only open for extremely short periods of time during the season. The EAO acknowledges that interactions between Indigenous Groups and TMJ-related vessels during the FSC fisheries windows, which are in limited duration, could have a greater effect on access to

fishing and that the likelihood of an interaction is high based on the BVS. The EAO recommends as part of the Marine Access and Transportation Plan, measures to mitigate effects on Indigenous traditional use activities, including LNG carrier call scheduling that accounts for and attempts to reduce LNG carrier calls during the anticipated timing window for Indigenous fishers operating under DFO fishing licences. TJLP would also synchronize bunker vessels arrivals at and departures from the jetty with regularly scheduled marine traffic (not associated with TMJ) when Indigenous fishers are operating under DFO fishing licences. TJLP would be required to provide opportunities to Indigenous Monitors to participate in monitoring during FSC fisheries windows to determine the effectiveness of the mitigation. Residual effects are considered continuous at the jetty site and frequent for vessels in transit, long-term (life of TMJ) and reversible. The increase of large vessels in transit from baseline would also be higher in the Fraser River than in the MSA area, so effects to access from TMJ-related vessel in transit could be experienced as higher in the Fraser River than the Salish Sea.

Experience: The EAO acknowledges that increased vessel traffic, noise associated with construction and operations, and changes in visual quality could affect Indigenous fishers' experience during navigation to fishing sites and the experience of harvesting at those sites. The EAO also acknowledges that the presence of LNG carriers and bunker vessels could affect the safety and perception of safety for Indigenous fishers through the potential for collision or other accidents and malfunctions. The EAO concludes that given the relatively small changes from current conditions predicted in the noise and visual quality assessments (negligible to low in magnitude) during construction and operations, in addition to information from Indigenous Groups provided through the EA including about safety and perception of safety, TMJ effects to the experience of fishing would be low in magnitude at the TMJ site and low from TMJ-related vessels in transit, compared to baseline conditions.

Conclusion: The EAO concludes that TMJ would result in low magnitude residual effects on Current Use for those Indigenous Groups who fish in and around the TMJ site and on the lower Fraser River, which are currently Musqueam Indian Band, Tsawwassen First Nation, Quw'utsun Nation and Tsleil-Waututh Nation. The EAO acknowledges that interactions between Musqueam Indian Band, Tsawwassen First Nation, Quw'utsun Nation, and Tsleil-Waututh Nation fishers and TMJ-related vessels during FSC windows would have a greater effect. The EAO acknowledges that Ts'uubaa-asatx Nation, Squamish Nation, Snuneymuxw First Nation, and Kwantlen First Nation, either aspire to, or are in the process of taking steps to be able to fish more regularly in the lower reaches of the Fraser River in the future, and should they do so, the EAO would expect similar residual effects to their Current Use for fishing. The EAO concludes that TMJ-related vessels would also result in low magnitude residual effects on

Current Use for fishing for Pacheedaht Nation and Ditidaht Nation as these Nations preferentially fish in the marine shipping lanes (e.g., Swiftsure Bank). The EAO concludes that TMJ would result in negligible to low effects to Maa-nulth First Nations as there is a portion of their domestic fishing area that overlaps with the shipping lanes. The effects would be regular, long term (up to 30 years), and reversible.

The EAO concludes that TMJ would result in negligible effects to Current Use for Semiahmoo First Nation, Squamish First Nation, Stó:lō Nations, Katzie First Nation, the Métis Nation of BC, Songhees First Nation, Esquimalt First Nation, Malahat Nation, T'Sou-ke First Nation, Tsawout First Nation, Pauquachin First Nation, Tsartlip First Nation, Tseycum First Nation and Scia'new First Nation. The EAO does not have information to suggest that these Indigenous Groups currently fish in and around the TMJ site, or preferentially in the shipping lanes. However, there could be incremental to access to fishing sites in the Fraser River and MSA area from TMJ-related vessels interacting with Indigenous Groups' transit to fishing areas.

Given the above low magnitude residual effects to some Indigenous Groups, the EAO concludes that TMJ is not likely to have significant residual effects on Current Use for fishing. Please see Section 11.4.5 below for the EAO's cumulative effects assessment.

Current use for other Traditional and Cultural Uses [CEAA 5(1(c)(iii)] and Cultural Heritage CEAA 5(1)(c)(ii)]

Effects to cultural resources: Many Indigenous Groups have identified SRKW to be of key importance to Indigenous culture. Refer to Part C of this Report for Indigenous Group-specific details on cultural values associated with SRKW. For example, in their comments on the EAO's draft Assessment Report, Tsleil-Waututh Nation commented that TMJ-related shipping effects to SRKW would result in serious effects to their cultural relationship with the SRKW and their ability to practice their ongoing traditional Coast Salish culture which Tsleil-Waututh views as key part of maintaining and improving cultural health. Musqueam Indian Band identified an important role of SRKW in Musqueam's oral histories and traditions, including songs and artwork, which are essential for cultural wellbeing. Musqueam Indian Band considers that effects on SRKW and their potential loss, would result in disruptions to their cultural continuity. The EAO concluded that TMJ would not cause significant residual adverse effects to SRKW from shipping, as outlined in the Marine Mammals chapter (Section 5.7) of this Report. Cumulative effects to Cultural Heritage, including SRKW, are assessed in Section 11.4.5.

Access: The EAO has assumed that mariners would avoid entering and remaining in the marine terminal area due to the warning signs and notifications regarding elevated public risk due to LNG berthing, loading and de-berthing activities (on average, one vessel call or two vessel

movements a day in the BVS). Indigenous access to known heritage resources could be affected during construction and operations by LNG berthing, loading and de-berthing activities and through TMJ-related vessels in transit. However, the EAO considers that potential effects to access to heritage resources including cultural sites, cultural travel routes, and Cultural Heritage in the TMJ area would be low magnitude due to size of the marine terminal area compared to the LAA/ RAA and the low magnitude increase from baseline of vessel in transits, short duration of the transit, and the distances from the TMJ area to the known heritage resources. The EAO acknowledges that, the BVS (i.e., daily vessel calls at the jetty) may result in more frequent interactions with vessels in transit. For the MSA area, the EAO is of the opinion that, given the potentially infrequent and short duration of interactions between regular TMJ-related vessel transits within the MSA and Indigenous mariners (including fishers and those travelling the MSA area on traditional canoe journeys), the effects listed above would not likely result in significant residual effects to other traditional and current uses.

Experience: As noted in the Noise (Section 6.2) and Visual Quality (Section 8.3) chapters of this Report, noise and visual effects during construction and operations (when LNG carrier vessels are at berth) would have negligible to low level effects depending on the location of the viewer/ listener. The EAO is of the opinion that the visual and acoustic changes as a result of TMJ are not likely to be substantially different than the existing conditions adjacent to the TMJ site. Nevertheless, the EAO acknowledges that some Indigenous people may find the presence and sound of LNG carriers disturbing for safety and/ or aesthetic reasons or for other personal reasons both at the TMJ site and from TMJ-related vessels in transit. The EAO also acknowledges Indigenous concerns that noise and visual disruptions and concerns about safety could then lead to reduced opportunities for cultural transmission including Indigenous language acquisition by younger generations while undertaking traditional harvesting activities on land or on the water. In their comments on the EAO's draft Assessment Report, Tsawwassen First Nation stated that any disruption to Tsawwassen's ability to exercise its Treaty fishing and harvesting rights could have potentially severe consequences for Tsawwassen's cultural continuity, as well as its members' physical and mental health and economic conditions. Tsleil-Waututh Nation expressed that effects on Tsleil-Waututh peoples' ability to participate in all aspects of their traditional culture and spiritual practice would negatively member's cultural health.

Conclusions: Given the above, the EAO concludes that TMJ is not likely to result in significant adverse effects on other traditional and cultural uses that contribute to their current use of lands and resources for traditional purposes or Cultural Heritage for the Application scenario or BVS. The EAO's assessment of TMJ contributions to existing cumulative effects on Other Traditional and Cultural Uses and Cultural Heritage is outlined in Section 11.4.5.

11.4.5 CUMULATIVE EFFECTS ASSESSMENT

As noted in other assessment sections of this Report, there are numerous existing and reasonably foreseeable projects and activities in the RAA[149] and in the MSA RSA[150] that have the potential to interact cumulatively with TMJ with respect to effects to Current Use and Cultural Heritage. TJLP did not find any residual effects that interacted with components of Current Use or Cultural Heritage following application of mitigation measures, and as such, did not undertake a cumulative effects assessment in either the original Application area or for the MSA. The following information summarizes the issues identified during Application review and the EAO's conclusions on cumulative effects.

11.4.5.1 ISSUES IDENTIFIED DURING APPLICATION REVIEW

Many Indigenous Groups expressed that from their vantage baseline conditions caused by past and present projects and activities combined with incremental effects from TMJ and other reasonably foreseeable projects would result in significant residual cumulative effects on Current Use and Cultural Heritage.

CUMULATIVE EFFECTS TO FISHING

Indigenous Groups noted that current levels of development, shipping, and DFO fisheries management activities in the Fraser River and the Salish Sea are already reducing their access to and their ability to harvest resources. It was noted that reduced harvests would affect economic, cultural, and social structures within their respective communities through a reduced connection to historical and current traditions.

With respect to cumulative effects to access to marine fishing, Musqueam Indian Band highlighted their Marine Shipping Effects Assessment that was submitted through the RBT2 panel process, which outlined their conclusions on shipping induced exclusion and effects to

[149] For this section the EAO considered the cumulative effects of the VAFFC (1.3km downstream); Vancouver Fraser Port Authority Fraser River Annual Dredging Program; the Seaspan Ferries Tilbury Terminal Expansion – Adjacent; the Fortis Tilbury LNG Plant Expansion Project – Adjacent; the Delta Grinding Facility – Adjacent; the Roberts Bank Terminal 2 Expansion Project; the Trans Mountain Expansion Project; Port Metro Vancouver's Centerm and Vanterm Expansion Projects; and the existing traffic levels in the Salish Sea.

[150] The EAO also considered the cumulative effects of the projects listed in Table 2.0-6 of the MSA Application.

fishing and fishing areas within tidal windows and time of year [151]. Musqueam Indian Band's report recommends monitoring future interactions, minimizing interactions during fishery openings, engaging with project proponents to further minimize interactions, and to promote communication amongst vessel operators to reduce effects to Musqueam Indian Band fishers. Musqueam Indian Band have told the EAO that due to industrial development on the Fraser River, and high levels of commercial traffic, there are a limited number of remaining areas within Musqueam territory on the lower Fraser River to productively fish. Musqueam Indian Band reported identified over fifty site-specific fishing values associated with the TMJ site and from Musqueam Indian Band's perspective, if they are unable to continue to fish at Tilbury Island, it would amount to an irreversible and irreplaceable loss of opportunity to exercise Musqueam's fishing right on the Fraser River.

Tsawwassen First Nation have informed the EAO that fishing has been heavily constrained by historic and existing effects and that from their perspective many rights-based thresholds have already been surpassed and that the potential adverse effects and increased risks from TMJ will take place in a context of many existing cumulative effects from existing development. Tsawwassen First Nation have explained that due to the level of current cumulative effects, further increases to vessel traffic and other conditions inconsistent with Indigenous fishing would have significant cumulative effects.

Cowichan Nation Alliance highlighted that cumulative effects on Current Use are serious; incremental increases in projects and activities heighten the degree of effect on use, access and experience. Cowichan Nation Alliance have told the EAO that TMJ would impede access to an area of Tilbury Island shoreline that has been used by Cowichan Nation Alliance community members for harvesting for well over 30 years at the very least. Cowichan Nation Alliance noted that TMJ precludes access along one of the last available stretches of shoreline on Tilbury Island and that even with mitigations, from their vantage, TMJ would likely result in significant adverse effects on Cowichan Nation Alliance fishing practices. Cowichan Nation Alliance consider any interruption of fishing during a high-yield opportunity to be severe.

Tsleil-Waututh Nation commented that the use and occupancy of the Salish Sea has been affected by changes in fish availability, seasonal change, closures, pressure by other marine users, which in turn have forced Tsleil-Waututh Nation to adapt their fishing and harvesting patterns to compensate for these changes. In general, Tsleil-Waututh Nation disagreed with

[151] Tam, J., Olson, R., and the Firelight Group. May 9, 2016. Musqueam Marine Shipping Effects Assessment. Port Metro Vancouver's Proposed Robert's Bank Terminal 2 Project. https://iaac-aeic.gc.ca/050/documents/p80054/129455E.pdf.

TJLP's conclusions on Current Use outlined in the Application and raised specific concerns about cumulative effects to fish and marine mammals. Tsleil-Waututh Nation recommended that a cumulative effects assessment for fish be undertaken.

Pacheedaht First Nation informed the EAO that any increase to levels of large marine vessel traffic within Pacheedaht territory would have significant adverse effects on Pacheedaht people and that the level of risk to Pacheedaht harvesters at Swiftsure bank has already surpassed a critical threshold, resulting is loss of opportunity to harvest in preferred locations at preferred times. Pacheedaht also stressed that the frequency of existing shipping traffic is so high as to make it practically impossible for Pacheedaht fishers to schedule fishing activity to avoid vessels even if this schedule were known to Pacheedaht fishers. Pacheedaht informed the EAO that the potential for cumulative effects should be considered high due to the level of interference with existing fishing practices as a result of the current level of shipping traffic in the Strait of Juan de Fuca, in particular, at Swiftsure Bank. The EAO heard from Maa-nulth First Nations that Swiftsure Bank represents a pinch point due to the levels of vessel traffic in the outbound shipping lane that overlaps the area; however, the EAO also understands that the entire Maa-nulth Domestic Fishing Area is considered as important areas for fishing by Maa-nulth First Nations.

Indigenous Groups also raised concerns about existing conditions on the experience of practicing traditional uses, including visual quality; noise quality; shipping interruptions of FSC fishing; effects of cumulative vessel traffic to Indigenous mariner's safety from vessel wake and collision risk; and corresponding willingness of their members to travel and harvest in the marine environment. For example, Malahat Nation commented that calm, summer days are selected by for by Malahat Nation to conduct traditional activities including harvesting and canoe travel and reported accounts of canoes sinking due to freighter wakes while crossing shipping lanes during traditional canoe voyages. Tsawwassen First Nation have noted that the area is already heavily developed and visually affected at baseline, so overall the cumulative effects of incremental change to visual quality would be significant from their perspective. Maa-nulth First Nations stated that large vessels travel west and northwest outside of the MSA area and through their Domestic Fishing Area and these vessels can restrict Maa-nulth First Nations' fishing activities. Both Esquimalt First Nation and Maa-nulth First Nations told the EAO that any impact to their treaty rights, interests, and culture due to marine shipping are significant, given the volume of existing vessel traffic and reasonably foreseeable future increases vessel traffic anticipated in their respective territories.

The EAO proposes provincial conditions and recommended KMMs under CEAA 2012, as per Section 11.4.4 above, to mitigate TMJ-related effects. However, the EAO acknowledges that

these mitigations measures would not reduce effects for baseline conditions and/ or effects of future projects, which are a key issue for many Indigenous Groups. The EAO notes several existing initiatives of the Crown are currently underway to collect habitat and monitoring information and implement management measures, to help slow, and ultimately reduce cumulative effects in the Salish Sea and Fraser River. Recent Crown management measures and existing initiatives related to the protection of SRKW (i.e., the Whales Initiative and ECHO program) are outline in Marine Mammals (Section 5.7) of this Report. Also, other relevant Crown initiatives designed to train, fund and equip Indigenous Groups to be safer, more informed, and better prepared in the waters of the Salish Sea are also outlined in Section 2.1 of Part C. The EAO notes that these programs are broad in nature and are not intended to mitigate or accommodate for the specific potential effects to Indigenous mariners and fishers navigating in proximity to TMJ vessels within the established Traffic Separation Scheme of the Salish Sea.

The EAO also recommends a KMM under CEAA 2012 for TJLP to identify how they are participating in the identification and implementation of regional initiatives related to effects on current use of lands and resources for traditional purposes as a result of marine shipping.

The EAO is aware that TJLP has committed to contribute up to $2 million to the FNFLF[152], which is a program led by several Indigenous groups that supports recovery programs for chinook salmon, eulachon and sturgeon in the Fraser River and Salish Sea. For more information about the EAO's consideration of TJLP's contribution proposal, refer to Section 13.1 on Current Context and Cumulative Effects in Part C.

[152] TJLP's proposal for Unconventional Offsetting Accommodation for Residual Project and Cumulative Effects, dated July 5, 2021. (https://www.projects.eao.gov.bc.ca/api/document/61099898cd98620022b0832b/fetch/20210707_TilburyJettyLimitedPartnership_UnconventionalOffsetProposal.pdf).

CUMULATIVE EFFECTS OTHER TRADITIONAL AND CULTURAL USES [CEAA 5(1)(C)(III)] AND CULTURAL HERITAGE [CEAA 5(1)(C)(ii)]

Musqueam Indian Band commented that even with mitigation, TMJ is expected to cause significant adverse effects on Musqueam Indian Band's use of the preferred area in the vicinity of Tilbury Island. This could result in future avoidance of the area and therefore loss of Cultural Transmission and Musqueam Sense of Place and Identity and Cultural Continuity. Musqueam Indian Band informed the EAO that the degree of change posed by TMJ, combined with effects of past, current and foreseeable projects and activities, exceed Musqueam's own threshold of acceptable change.

Indigenous Groups raised concerns about TJLP and the EAO's assessment of residual effects and cumulative effects on SRKW, a species of key importance to Indigenous culture. Indigenous Groups that raised concerns about effects to SRKW relating to cultural and spiritual importance include: Musqueam Indian Band; Tsleil-Waututh Nation; Tsawwassen First Nation; Quw'utsun Nation; Snuneymuxw First Nation; Kwantlen First Nation; Malahat Nation; Pacheedaht First Nation; Ditidaht First Nation; Pauquachin First Nation; Esquimalt First Nation; Tsawout First Nation; T'Sou-ke First Nation; Maa-nulth First Nation; Tsartlip First Nation; Tseycum First Nation; Songhees First Nation and Scia'new First Nation. Refer to Part C of this Report for Indigenous Group-specific details on cultural values associated with SRKW.

Tsleil-Waututh Nation submitted several technical comments regarding TJLP's assessment of effects to marine mammals that were considered in the EA. Tsleil-Waututh Nation expressed that increasing the cultural health of Tsleil-Waututh Nation community members by increasing opportunities for members' participation in aspects of their traditional Coast Salish culture is a high priority for Tsleil-Waututh Nation. Tsleil-Waututh Nation has expressed specific concerns about significant cumulative effects of shipping to Tsleil-Waututh Nation's cultural health and intangible cultural heritage, and specifically on spiritually significant areas and sacred tunnels[153]. Tsleil-Waututh Nations stated that the severity of cumulative effects to Tsleil-Waututh's Nations' ability to practice their ongoing Coast Salish culture and spiritual practices has been extreme since 1792, and that TMJ-related vessels would contribute to existing cumulative effects. Given the effects to SRKW, effects to Tsleil-Waututh Nation's ability to practice their culture and the cumulative effects of more than a century of development in the area, several specific TMJ-related activities are anticipated to negatively affect Tsleil-Waututh's Aboriginal

[153] For more details, please refer to Tsleil-Waututh Nation's assessment of impacts on Aboriginal Interests in Part C, authored by Tsleil-Waututh Nation.

right to fish, right to practice and preserve their traditional culture, and right to self-governance.

Tsawwassen First Nation are stewards of their entire Territory. Tsawwassen First Nation's health is a balance of physical, cultural, and spiritual well-being and is tied to Tsawwassen First Nation stewardship values, which are interwoven with several components of Tsawwassen First Nation's way of life. Stewardship is integral to community health, prosperity, and self-determination. Tsawwassen First Nation's goal is for their members to be united with a strong connection to their culture, the land, and its resources. TMJ would be located within the Tsawwassen Fishing Area and based on the potential effects to Tsawwassen First Nations' ability to access and harvest culturally important species including eulachon, salmon and sturgeon, and effects to knowledge transfer and cultural transmission, TMJ could affect their ability to govern and steward the area for current and future fisheries resources according to Tsawwassen laws, regulations and direction.

The EAO recommends a Cultural Heritage KMM under CEAA 2012, which would require TJLP to develop nation-specific measures to address the effects on tangible and intangible cultural losses caused by the construction and operation of TMJ, in consultation with those Indigenous Groups experiencing the effects, as described in this Report. As part of the measures, TJLP would be required to consider developing or contributing to Indigenous-led programs to preserve and enhance cultural heritage.

11.4.5.2 THE EAO'S CONCLUSIONS ON CUMULATIVE EFFECTS

The EAO notes that it did not conduct a comprehensive regional cumulative effects assessment on all the various existing constraints and effects pathways for Current Use for fishing or Cultural Heritage for the TMJ EA; this would be beyond the scope of a project-specific EA. Notwithstanding this limitation, in the cumulative effects assessment, the EAO considered where TMJ effects intersect with known constraints and cumulative effects and information provided by Indigenous Groups to better inform decision makers on how cumulative effect may be experienced by Indigenous Groups.

CUMULATIVE EFFECTS CONCLUSIONS FOR CURRENT USE FOR FISHING

The EAO concluded that there would be residual, non-significant cumulative effects on Fish and Fish Habitat in the marine terminal area and no residual effects in the MSA area (Section 5.6 of this Report). However, the EAO has heard from Indigenous Groups about the negative trends of fish populations, availability of fish, and that they are unable to fish particular species in either the amount or frequency, or in the preferred areas at the RAA and MSA RSA scale. The EAO notes that these baseline conditions, combined with the residual effects of TMJ and other

reasonably foreseeable projects in the lower Fraser River and in the Salish Sea could interact cumulatively. The EAO acknowledges that there is already extensive development and industrial activity in and around the lower Fraser River which is affecting Indigenous access to fishing areas in the RAA. Additionally, there are many vessels transiting both the lower Fraser River and the shipping lanes of the Salish Sea under baseline conditions which can affect Indigenous fishers access or transit to fishing areas. These existing access conditions would interact cumulatively with the residual effects to access in the TMJ marine terminal area (during LNG berthing, loading and de-berthing) and TMJ-related vessels transit (Application scenario or BVS), in addition to effects to access from future projects. Similarly, there are already high levels of existing effects to the visual and acoustic environment from the Indigenous perspective in the RAA. There are also existing concerns about safety from collisions and vessel wake in both the RAA and MSA RSA that are already affecting the practice of fishing. These too would interact cumulatively with effects from TMJ and future projects.

The EAO acknowledges that the current state of the RAA and MSA RSA may not provide Indigenous Groups the ability to currently use the region for fishing in their preferred manner[154]. Based on information from Indigenous Groups, and in consideration of the existing landscape in the TMJ area, the EAO is of the view that it is reasonable to assume that there is an existing significant, cumulative effect for fish resources, access and experience in the lower Fraser River and in the shipping lanes, and that TMJ would further contribute to that significant cumulative effect. The EAO concludes that it is reasonable to expect that past and future effects on fish and fish habitat, access to fishing and the experience of fishing would combine with TMJ effects to result in significant cumulative effects for those Indigenous Groups that fish preferentially at the TMJ site: Tsawwassen First Nation, Musqueam Indian Band, Quw'utsun Nation, and Tsleil-Waututh Nation. The EAO acknowledges that Ts'uubaa-asatx Nation, Squamish Nation, Snuneymuxw First Nation, and Kwantlen First Nation expressed a strong interest in fishing regularly in the lower Fraser River in the future and should they do so, the EAO would conclude similar significant cumulative effects to their Current Use for fishing in the RAA. Residual effects from TMJ on access and experience could combine with existing significant cumulative effects for those Indigenous Groups that fish preferentially in the shipping lanes: Pacheedaht First Nation and Ditidaht First Nation.

[154] A key factor contributing to the significance of existing cumulative effects is that the traditional activities of Indigenous Groups, which may be affected by TMJ, are not currently practiced in the preferred manner because of conservation issues, lack of access, or existing constraints.

For Indigenous Groups that do not currently fish at the TMJ site or preferentially in the shipping lanes, the EAO concludes that cumulative effects to Current Use for fishing would occur but would not be significant. This would apply to Semiahmoo First Nation, Squamish First Nation, Stó:lō First Nations, Katzie First Nation, and MNBC; Songhees First Nation, Esquimalt First Nation, Malahat Nation, T'Sou-ke First Nation, Tsartlip First Nation, Tseycum First Nation, Tsawout First Nation, Pauquachin First Nation, Scia'new First Nation and Maa-nulth First Nations.

Based on concerns raised by Indigenous Groups about cumulative effects and the number of LNG carriers transiting the Fraser River and Salish Sea, as well as the EAO's conclusions of significant cumulative effects to Current Use for fishing, the EAO also recommends a KMM under CEAA 2012 to ensure that, in each calendar year, TMJ would receive a maximum of 365 LNG vessel calls, of which a maximum of 68 would be LNG carrier calls.

CUMULATIVE EFFECTS CONCLUSIONS FOR CURRENT USE FOR OTHER TRADITIONAL AND CULTURAL USES AND CULTURAL HERITAGE

The EAO reviewed the RBT2 Panel Report which concluded that there is an existing significant, cumulative effect on cultural heritage at baseline in the MSA and that any increase in ship movements would further contribute to that significant cumulative effect. Based on information provided by Indigenous Groups regarding important cultural resources, such as cultural travel or canoe journey routes, physical heritage sites, spiritual sites, ability to practice and transmit culture and language and SRKW, that contribute to tangible and intangible cultural heritage, the EAO is of the view that there is an existing significant, cumulative effect on cultural heritage in both the lower Fraser River and around Tilbury Island, in or near the shipping lanes, and for cultural values associated with SRKW.

The EAO concludes that TMJ-related activities and shipping, interacting with existing baseline conditions and other present and foreseeable projects, would contribute to significant cumulative effects to cultural heritage for:

- Indigenous Groups that identify SRKW to be of importance to Indigenous culture;
- Tsleil-Waututh Nation related to cultural and spiritual practices;
- Musqueam related to cultural continuity and sense of place and identity;
- Tsawwassen First Nation related to cultural well-being and stewardship aspirations under Tsawwassen First Nation's Treaty; and
- Pacheedaht First Nation and Ditidaht First Nation related to cultural practices, language and knowledge transmission.

The EAO notes that several initiatives led by the Government of Canada are currently underway to collect habitat and monitoring information, implement management measures to address cumulative effects, and support capacity building by Indigenous groups to undertake studies and stewardship activities in the Salish Sea and lower Fraser River. These include specific initiatives, as well as additional measures targeted to support the protection and recovery of SRKW, including cumulative effects from marine shipping. These measures are outlined in the Marine Mammal (Section 5.7) and Part C (Section 13.1.1) of this Report. The EAO recommends a Cultural Heritage KMM under CEAA 2012, which would require TJLP to develop nation-specific measures to address the effects on tangible and intangible cultural losses caused by the construction and operation of TMJ, in consultation with those Indigenous Groups experiencing the effects, as described in this Report. As part of the measures, TJLP would be required to consider developing or contributing to Indigenous-led programs to preserve and enhance cultural heritage. Based on concerns raised by Indigenous Groups about cumulative effects and the number of LNG carriers transiting the Fraser River and Salish Sea, as well as the EAO's conclusions of significant cumulative effects to Cultural Heritage [CEAA 2012 5(1)(c)(ii)], the EAO also recommends a KMM under CEAA 2012 to ensure that in each calendar year TMJ would receive a maximum of 365 LNG vessel calls, of which a maximum of 68 would be LNG carrier calls.

11.4.6 CONCLUSIONS

Considering the analysis above and the conditions identified in the CPD and TOC (which would become legally binding if an EAC is issued), as well as the recommended KMMs under CEAA 2012 (Appendix 1), the EAO concludes that TMJ would not have significant residual adverse effects on Current Use [CEAA 2012 5(1)(c)(iii)] and Cultural Heritage [CEAA 2012 5(1)(c)(ii)].

The EAO concludes that the predicted residual effects from TMJ, in combination with the effects of past, existing and reasonable foreseeable projects, would cause significant adverse cumulative effects on the fishing component of Current Use [CEAA 2012 5(1)(c)(iii)] for Tsawwassen First Nation, Musqueam Indian Band, Quw'utsun Nation, Tsleil-Waututh Nation, Pacheedaht First Nation and Ditidaht First Nation (and potentially Ts'uubaa-asatx Nation, Snuneymuxw First Nation, Squamish Nation and Kwantlen First Nation, should they fish regularly in the Fraser River in the future).

The EAO concludes that the predicted residual effects from TMJ, in combination with the effects of past, existing and reasonably foreseeable projects, would cause significant adverse cumulative effects on Cultural Heritage [CEAA 2012 5(1)(c)(ii)]. Specifically for Tsleil-Waututh Nation related to cultural and spiritual practices, Musqueam Indian Band related to cultural

continuity and sense of place and identity, Tsawwassen First Nation related to cultural well-being and stewardship aspirations under Tsawwassen First Nation's Treaty, and for Pacheedaht First Nation and Ditidaht First Nation related to cultural practices, language and knowledge transmission, and those Indigenous Groups that use SRKW for cultural purposes including: Musqueam Indian Band; Tsleil-Waututh Nation; Tsawwassen First Nation; Quw'utsun Nation Indigenous Groups; Kwantlen First Nation; Snuneymuxw First Nation, Ts'uubaa-asatx Nation; Malahat Nation; Pacheedaht First Nation; Ditidaht First Nation; Pauquachin First Nation; Esquimalt First Nation; Tsawout First Nation; T'Sou-ke First Nation; Maa-nulth First Nation; Tsartlip First Nation; Tseycum First Nation; Songhees First Nation; and Scia'new First Nation.

PART C – ABORIGINAL CONSULTATION REPORT

12.0 EAO CONSULTATION PROCESS METHODOLOGY

12.1 ABORIGINAL INTERESTS

The Governments of BC. and Canada have a duty to Consult and where necessary, accommodate for government decisions that may impact potential or established Aboriginal or Treaty Rights (including title). In carrying out this duty, in its assessment the EAO considered potential for impacts to "Aboriginal Interests" more broadly to include Aboriginal or Treaty Rights, (including title), as well as a range of interests held by Indigenous Groups[155], including Treaty partners[156], that extends beyond those that are strictly linked to the duty to Consult. This approach is consistent with BC and Canada's commitment to relationship building and reconciliation with Indigenous Groups.

Through their work with Indigenous peoples, the EAO and IAAC are also committed to advancing reconciliation by implementing the standards set out in the United Nations Declaration on the Rights of Indigenous Peoples (the UN Declaration) and the Truth and Reconciliation Commission (TRC) of Canada Call to Actions. In November 2019, the Government of BC passed the *Declaration on the Rights of Indigenous Peoples Act* into law, which establishes the UN Declaration as the framework for reconciliation, as called for by the TRC's Calls to Action. Also, the *United Nations Declaration on the Rights of Indigenous Peoples Act* received Royal Assent in June 2021.

Below is more information about the EAO's impact assessment methodologies, consultation and engagement activities related to the EA for TMJ, and potential impacts to Aboriginal Interests. Please note, that where Indigenous Groups have identified a specific preferred term to use in reference to their Aboriginal Interests, the EAO has used that term. Also note, that throughout this document the use of the term "territory" refers to the asserted traditional

[155] "Indigenous Groups" means those Aboriginal entities identified in Schedule B and Schedule C of the Section 11 Order for TMJ, and subsequent Section 13 Orders that amended the Section 11 Order to include Schedule D (see Section 2.2 of Part B).

[156] Refers to interests of Treaty partners extending beyond just the four corners of the Treaty.

territories of Indigenous Groups unless the territories are established treaty lands or otherwise established at law or recognized by B.C. and Canada. An EA is not a rights-determining process.

12.2 IMPACTS ASSESSMENT METHODS

The EAO's analytical framework for assessing the seriousness of impacts on Aboriginal Interests is not the same as the significance test for environmental, socio-economic, or other VCs in Part B of this assessment report. A holistic approach is taken on the impact assessment on Aboriginal Interests, which considers cumulative effects, including through the consideration of the existing state or baseline conditions of various biophysical factors, any conservation concerns, impacts of existing or past developments, and the relative importance of an area to an Indigenous Group.

The EAO recognizes that adverse project impacts on Aboriginal Interests may not arise solely from changes to the biophysical environment. In many instances, information regarding potential biophysical and/or socio-economic effects from a project or activity, and in particular effects on traditional, current, and future land and marine resource uses, will be relevant to an assessment of impacts on Aboriginal Interests. In addition to information in the Application, the assessment of impacts on Aboriginal Interests also considers information provided during the Application Review phase, including information provided directly by Indigenous Groups.

Rights-based Aboriginal Interests are understood as associated with traditional practices related to hunting, trapping, gathering, fishing, marine harvesting, or other cultural or spiritual practices, but may not be limited to these practices. The EAO has considered the following three components in the assessment for potential impacts of project-related activities on rights-based Aboriginal Interests of Indigenous Groups:

- **Biophysical factors:** Consideration of potential effects on biophysical factors that are important for, or associated with, the exercise of the right. This can include consideration of the sufficiency of resources specific to VCs relevant to the exercise of the right (e.g., fish, wildlife), the species harvested by the Indigenous Group (with respect to the harvesting rights), the potential effects of the proposed activity on the resources habitat, food source quantity and quality, existing state of habitat or food source, potential effects on species distribution, duration of impacts to biophysical component, relevant mitigation measures, and the efficacy of such mitigation measures;

- **Geospatial factors (sites, places and access)**: Consideration of potential effects on specific sites or traditional use areas where rights are currently exercised or held, including those sites where an Indigenous Group has exercised the right in the past,

plans to exercise, or aspires to exercise a right in the future. This can include consideration of whether there are any traditional land or marine use sites associated with the exercise of the right identified overlapping or in proximity to the project area, the number of such sites, effects on the access to such sites, and the frequency, duration or timing of impacts to access to such sites, increased public access, relevant mitigation measures, and the efficacy of such mitigation measures; and

- **Social, Cultural, Experiential Values:** Consideration of potential effects on social, cultural, spiritual and experiential aspects of the exercise of the right. This can include potential direct and indirect effects of the project, including duration and frequency of potential effect, on sensory disturbance, the experience of exercising the right in the area, effects on community health, on socio-cultural institutions, teaching and knowledge transfer, ceremonial or spiritual practices associated with the right and any relevant mitigation measures and the efficacy of such mitigation measures. This also includes if there are any special characteristics or unique features of this area, the relative importance of the project area and its surroundings to the exercise of the right and associated activities, practices, customs and traditions.

Within each of the components of rights-based Aboriginal Interests above, there are a number of relevant factors considered, including factors relating to cumulative effects (e.g., the site in question is the only remaining and most important harvesting site for the Nation, or a determination of significant residual or cumulative effects of a biophysical from Part B), which could increase the seriousness of impact for that component. The EAO recognizes that Aboriginal Interests are held at a larger geographic scale than that which is generally assessed during an environmental assessment (i.e., rights are often exercised at a scale beyond the RAA).

The assessment of seriousness of impacts on rights-based Aboriginal Interests is primarily focused on factors related to impacts from the project itself (e.g., impacts from the project to biophysical factors, Indigenous use of the site, social, cultural and experiential factors). However, the assessment also considers the historical context or current state of affairs in the broader regional area in relation to an Indigenous Group's use of this portion of its territory (e.g., relative importance of the site), see Section 13.1 of Part C.

The overall assessment of the seriousness of impact on the right includes a supporting rationale based upon residual and cumulative impacts to the biophysical factors, specific sites or areas, and the social, cultural, spiritual, and experiential context within which the rights are exercised, in addition to considering mitigations and accommodations. The overall seriousness of impact conclusions is generally based on an equal weighing of the components noted above (i.e.,

biophysical factors, geospatial factors, or social, cultural, and experiential values); however, the assessment process is subject to modification on a case-by-case basis. Where Indigenous Groups or Treaty Nations have provided additional information beyond the factors listed above, the EAO has also considered this information in the overall seriousness of impact assessment.

The EAO's overall assessment of the seriousness of impacts on Aboriginal title includes a supporting rationale based upon a consideration of the residual impacts of the project on the use and occupation, decision making, and economic components of Aboriginal title[157]:

- **Use and occupation:** Consideration of any potential alienation of an area, the degree of potential disturbance or functional effect of the potential disturbance associated with TMJ, how the proposed decision might restrict community members' access to the area, and how the proposed decision might affect community members' enjoyment, experience, and use of the area, now and in the future;
- **Decision-making:** Consideration of the proposed decision, the extent to which an Indigenous Group might be involved in the decision-making process, and whether the activity might be consistent or inconsistent with any cultural or other objectives of the Indigenous Group for management in this area, now and in the future; and
- **Economic benefits:** consideration of whether the project-related decision might affect a community's ability to derive direct and/or indirect economic benefits from the area, and how the proposed decision might affect a community's economic development aspirations for the area, now and in the future.

Understanding the level of impacts to Aboriginal Interests requires an understanding of potential project effects, including the perspectives of Indigenous Groups on potential project effects gained through an iterative engagement process. The overall seriousness of impact on Aboriginal Interests is informed by residual impacts after mitigations and accommodations have been factored in, including a consideration of the adequacy of those measures. Generally, the EAO considers mitigations as including EA mechanisms (e.g., EAC conditions, environmental mitigation and management plans, habitat offsetting and follow-up plans, etc.), relevant government-led initiatives, or other processes that address specific impacts. Potential accommodation may also be brought forward by other sources, such as the proponent, that are

[157] With respect to the interests of Treaty Nations, which are unique to each Treaty relationship, the EAO's assessment of potential impacts to Aboriginal Interests are included in each Treaty Nation's individual sections below.

considered and assessed to determine if they would further reduce the potential seriousness of impact on Aboriginal Interests. These measures may include commitments such as financial compensation, procurement contracts, or employment training. Impacts on Aboriginal Interests are assessed for each individual Indigenous Group and for each category of rights in Section 14 (Schedule B), Section 15 (Schedule C), and Section 16 (Schedule D) of this Report. These impacts are described based on the level of seriousness of potential impacts from negligible to serious, defined as follows[158]:

Potential Impact[159]	Characterization
Negligible	No detectable impact or any change from current conditions
Negligible-to-minor	Some detectable impacts or change from current condition
Minor	Ability to exercise the right (or interest) is minimally disrupted
Minor-to-moderate	Ability to exercise the right (or interest) is more than minimally disrupted
Moderate	Ability to exercise the right (or interest) has been diminished or disrupted
Moderate-to-serious	Ability to exercise the right (or interest) has been more than moderately diminished
Serious	Ability to exercise the right (or interest) has been significantly diminished

When reporting on potential impacts to Aboriginal Interests, the EAO acknowledges that the impacts experienced by Indigenous Groups can vary in time and space. That is, impacts on Aboriginal Interests in one area of an Indigenous Group's territory may not be the same as elsewhere, and impacts during construction may not be the same as during operations or decommissioning. The EAO recognizes that areas within the territory of each Indigenous Group may be particularly important and valuable for specific qualities associated with traditional cultural or spiritual practices, and that this could vary throughout the year or under certain circumstances. These areas may also be used for traditional harvesting activities (e.g., hunting,

[158] The EAO described impacts based on the level of seriousness from negligible to serious as shown, except where Indigenous Groups provided their own description of the level of seriousness for an impact to their Aboriginal Interests in Part C.

[159] As noted in the list of "factors" the EAO considers in its assessment of impacts to Aboriginal Interests, the extent to which current conditions affects the exercise of rights is also considered in the assessment.

trapping, fishing, and gathering) by individual members or families. The EAO also acknowledges that the current context includes the effects of past and present projects or activities and considers these factors when determining the overall seriousness of impact assessment of TMJ on Aboriginal Interests.

The rationale for the level of impact to Aboriginal Interests will highlight key factors and information considered and those factors that are given greater weight while noting confidence in any assumptions made and any remaining uncertainties. For each Indigenous Group, the level of impact reported in the impact assessment is the greatest expected impact on Aboriginal Interests from construction and operation of TMJ. Further, the EAO considers that where the cumulative effects of past and present activities have negatively affected conditions today compared to those required for the meaningful practice of the right, the conclusion on overall effects from a current project combined with existing constraints or effects would be more serious. If consensus on the level of impact is not reached with the Indigenous Groups who have communicated to this effect through written submissions or in meetings with the EAO, this difference of opinion will be clearly articulated. Further information related to the EAO's considerations of current context and cumulative effects in the impact assessment on Aboriginal Interests is provided in Section 13.1.

12.3 DEPTH OF CONSULTATION

The following sections discuss the procedural elements of Indigenous consultation or engagement activities undertaken by the EAO and TJLP[160].

To determine whether an Indigenous Group would be included on Schedule B or C of the Section 11 Order, the EAO considered the overlap of TMJ with each Indigenous Group's asserted traditional territory or Treaty Lands, the nature of the potential impact on each Indigenous Group's Aboriginal Interests, and, where applicable, an initial assessment of the strength of claimed Aboriginal rights and title.

Schedule B lists Indigenous Groups engaged at the deeper end of the consultation spectrum (including participation in the Working Group) and Schedule C lists Indigenous Groups at the lower end of the consultation spectrum. Schedule D lists Indigenous Groups at the deeper end

[160] On June 11, 2020, the EAO was notified that Tilbury Jetty Limited Partnership (TJLP) replaced WesPac Midstream-Vancouver LLC as the new proponent for TMJ. TJLP is a partnership between affiliates of Fortis and Seaspan. References to TJLP includes all consultation and engagement activities, submissions and studies conducted by WesPac Midstream-Vancouver LLC prior to the ownership transfer of TMJ.

of the consultation spectrum specifically with respect to potential impacts of marine shipping (including participation in the Marine Shipping Working Group).

The EAO's initial assessment of the required scope of the duty to consult was presented to the Indigenous Groups that were originally identified on Schedules B and C for review and comment as part of consulting on the draft Section 11 Order. The EAO considered comments received from Indigenous Groups and issued the Section 11 Order on July 24, 2015, which specifies the consultation activities that both the EAO and TJLP would undertake with Indigenous Groups potentially affected by TMJ.

Over the course of the EA, the EAO made five updates to the lists of Schedule B and Schedule C Indigenous Groups listed on the Section 11 Order through subsequent Section 13 Orders[161] as follows:

- September 25, 2015 – added People of the River Referrals Office to Schedule C;
- May 11, 2016 – moved Semiahmoo First Nation, Squamish Nation, and Tsleil-Waututh Nation from Schedule C to B;
- February 14, 2018 – removed Hwlitsum from Schedule B; and
- January 19, 2022 – added Snuneymuxw First Nation to Schedule B for the BVS and kʷikʷəƛ̓əm (Kwikwetlem First Nation) to Schedule C.

The BC EA of TMJ was substituted for the federal EA as set out in the MOU between the EAO and the Agency. As specified in the MOU, the EAO conducted procedural aspects of Aboriginal consultation on behalf of both the provincial and federal Crown for the TMJ EA. To meet federal consultation agreements consistent with the MOU, the Métis Nation of BC (Métis Nation BC) was included on Schedule C for TMJ. Consultation with the Métis Nation BC is not an acknowledgement on the part of BC that it owes a duty to consult or accommodate Métis in BC under Section 35 of the *Constitution Act*, 1982. The EAO consulted Métis Nation BC on behalf of the Agency pursuant to the MOU on Substitution of EAs.

The Section 11 and 13 Orders identified consultation with the Schedule B and Schedule C Indigenous Groups outlined below.

[161] A Section 13 Order is used to modify, update, or replace sections of the Section 11 Order.

Schedule B:

- Cowichan Tribes
- Halalt First Nation
- Kwantlen First Nation
- Lake Cowichan First Nation (Ts'uubaa-asatx Nation)
- Lyackson First Nation
- Musqueam Indian Band
- Penelakut Tribe
- Tsawwassen First Nation[8]
- Stz'uminus First Nation
- Tsleil-Waututh Nation
- Semiahmoo First Nation
- Squamish Nation
- Snuneymuxw First Nation[162]

Schedule C:

- Katzie First Nation
- People of the River Referrals Office
- Stó:lō Nation
- Stó:lō Tribal Council
- Métis Nation British Columbia
- kʷikʷəƛ̓əm (Kwikwetlem First Nation)[162]

On August 6, 2019, at the request of the Government of Canada, the EAO under a Section 13 Order amended the geographic scope for the assessment of potential effects from marine shipping from Sand Heads to the 12nm mark and added the Schedule D First Nations listed below. The EAO and the Agency considered the overlap between the anticipated effects from

[162] Pursuant to Section 13 Order (dated January 19, 2022) the participation of the Snuneymuxw First Nation and kʷikʷəƛ̓əm is limited to that part of the assessment in which the information respecting the number and type of vessels that will potentially utilize the marine terminal, as set out in the letter from the Proponent to the Executive Project Director dated November 23, 2021, is considered (i.e., the BVS).

TMJ related vessels and an initial estimate of potential impacts on Aboriginal Interests and Treaty Rights in deciding which Indigenous groups to include under Schedule D.

Schedule D:

- Ditidaht First Nation
- Pacheedaht First Nation
- Maa-nulth First Nations[11]:
    - Huu-ay-aht First Nations
    - Ka:'yu:'k't'h'/Che:k'tles7et'h' First Nations
    - Toquaht Nation
    - Uchucklesaht Tribe
    - Ucluelet First Nation (Yuułuʔiɬʔaṯḥ First Nation)
- Pauquachin First Nation
- Tsawout First Nation
- Tsartlip Indian Band
- Malahat Nation
- Tseycum Indian Band
- Esquimalt Nation
- Songhees Nation
- Scia'new (Beecher Bay) First Nation
- T'Sou-ke (Sooke) First Nation

12.4 THE EAO-LED CONSULTATION ACTIVITIES WITH INDIGENOUS GROUPS

The EAO is of the view that it has approached consultation with the intent to identify potential impacts on Aboriginal Interests identified by Indigenous Groups in the project area, including the expanded marine shipping route to the 12 nm territorial limit. The EAO is also of the view that it has approached consultation with the intent to consider ways to address potential impacts to Aboriginal Interests through measures to avoid, mitigate, or offset, including assessing the adequacy of those, other relevant processes, or any proposed accommodation measures brought forward by the proponent.

The EAO invited Indigenous Groups on Schedule B to participate in the Working Group. As described in the Role of the Advisory Working Group section of Part A of this Report, working group participation included: review and comments on the draft VC Selection and draft AIR documents, screening of the Application, and review and comment on the Application and supplemental material, as well as the opportunity to review and comment in an iterative manner on the EAO's draft decision materials. The EAO is of the view that it has endeavoured to reflect and consider the concerns and perspectives that Indigenous Groups shared during the EA about the potential impacts to Aboriginal Interests in the project area, the adequacy of the proposed measures to address potential impacts to Aboriginal Interests, and the EAO's approach to consultation for the EA process in its decision materials.

Consultation with the Schedule B Indigenous Groups includes the following:

- Notification of the following major milestones:
    - Issuance of any Orders from the EAO, including Section 11 and 13 Orders;
    - The public comment period for the draft VC document;
    - Approval of the final VC document and the final AIR;
    - When the Application has been accepted, and the start of Application Review has commenced;
    - Commencement of public comment periods on the Application, and on the EAO's draft decision materials; and
    - Notification of the decision on the Application, when made;
- Participation in the Working Group or relevant Working Group subcommittee meetings;
- Opportunities to identify Aboriginal Interests or Treaty Rights and the potential adverse

effects of TMJ on Aboriginal Interests or Treaty Rights, as appropriate;

- Providing a copy of the Application during the applicable legislated time period and inviting Schedule B Indigenous Groups to comment on the conformity of the Application with the AIR and the Proponent's past and proposed Aboriginal Consultation activities;
- Opportunity to submit comments on the Application and to request additional information;
- Opportunities to meet with the EAO to discuss any outstanding concerns, including in relation to potential adverse its Aboriginal Interests or Treaty Rights with respect to the proposed project and measures to avoid, mitigate, or otherwise address or accommodate potential adverse impacts on Aboriginal Interests or Treaty Rights, as appropriate;
- Opportunity to review and comment on key documents for the EAO's consideration, including the draft Project Description, draft Section 11 Order, draft VC Selection document, draft AIR, TJLP's Application for EAC, supplemental materials, the EAO's draft Assessment Report (including Part C of the Assessment Report), the draft Certified Project Description (CPD) and draft Table of Conditions (TOC), and iterations of these key documents;
- Opportunity to review and comment on the KMMs, including revised iterations;
- Opportunity to collaboratively draft sections of the EAO's Assessment Report (Part C) within established timelines and propose certificate conditions within established timelines;
- Opportunity to comment on the adequacy of TJLP's responses to the comments and information requests submitted by Indigenous Groups; and
- Opportunity to submit a document outlining the Indigenous Group's views on the Assessment Report to be included in the package of materials sent to Ministers when TMJ is referred for decision.

Snuneymuxw First Nation were invited to participate in the Working Group for the remainder of the EA, related to the BVSA, and invited to develop its Part C chapter in collaboration with the EAO, and to review and comment on TJLP's BVSA Report, the EAO's Assessment Report, Summary Assessment Report, draft Certified Project Description, proposed provincial conditions and recommended KMMs under CEAA 2012.

Schedule C Indigenous Groups were provided the following:

- Notification of the following major milestones:

  - Issuance of any Orders from the EAO, including Section 11 and 13 Orders;
  - The public comment period for the draft VC document;
  - Approval of the final VC document and the final AIR;
  - When the Application has been accepted, and the start of Application Review has commenced;
  - The public comment period on the Application; and
  - Notification of the Decision on the Application;
- Opportunity to raise any issue with the EAO for discussion; and
- Opportunity to comment on the draft Assessment Report, proposed and draft CPD within established timelines.

As part of the increased shipping assessment area decision, the EAO invited Indigenous Groups on Schedule D to participate in a marine shipping working group. Participation in the working group for Schedule D Nations included the opportunity to review and comment on TJLP's Marine Shipping Assessment (MSA) and Bunkering Vessel Scenario Assessment (BVSA) reports as well as the opportunity to review and comment in an iterative manner on the EAO's draft decision materials. Consultation with Schedule D Indigenous Groups includes the following:

- Notification of the following major milestones:
  - Issuance of any Orders from the EAO;
  - Commencement of public comment periods on the Application, and on the EAO's draft decision materials; and
  - Notification of the Decision on the Application;
- Participation in the Working Group or relevant Working Group subcommittee meetings;
- Opportunities to identify Aboriginal Interests or Treaty Rights and the potential adverse effects of TMJ on Aboriginal Interests or Treaty Rights, as appropriate;
- Opportunities to meet with the EAO to discuss any outstanding concerns, including in relation to potential adverse effects to its Aboriginal Interests with respect to the proposed Project and measures to avoid, mitigate, or otherwise address or accommodate potential adverse impacts on Aboriginal Interests or Treaty Rights, as appropriate;
- Opportunity to review and comment on key documents for the EAO's consideration, including the EAO's draft Assessment Report (including Part C of the Assessment Report), the draft CPD, and the draft TOCs;
- Opportunity to review and comment on the KMMs, including revised iterations;

- Opportunity to collaboratively draft sections of the EAO's Assessment Report (Part C) within established timelines and propose certificate conditions within established timelines;
- Opportunity to be consulted on determining the adequacy of TJLP's responses to the comments and information requests received from Indigenous Groups; and
- Opportunity to submit a document outlining the Indigenous Group's views on the Assessment Report to be included in the package of materials sent to Ministers when TMJ is referred for decision.

12.5 PROPONENT-LED CONSULTATION ACTIVITIES WITH INDIGENOUS GROUPS

As part of the Section 11 Order and through subsequent applicable amendments under Section 13 Orders, the EAO directed TJLP to undertake certain procedural aspects of consultation during the EA with Schedule B Indigenous Groups. The Orders also required TJLP to develop and share drafts of an Aboriginal Consultation Plan and multiple Aboriginal Consultation Reports (ACRs), including ACR-1 (March 2017); ACR-2 (March 2019); ACR-3 (July 2019); and ACR-4 (May 2022), with the specified Indigenous Groups at prescribed milestones during the EA. These documents were reviewed by Schedule B Indigenous Groups and revised by TJLP based on input received from and concerns expressed by Indigenous Groups prior to being submitted for review to the EAO, as required.

These documents enabled the EAO to:

- Understand TJLP's consultation plans and subsequent efforts and the perspectives of the Indigenous Groups related to those efforts;
- Understand any issues and concerns identified by Indigenous Groups to TJLP and how TJLP has made efforts to respond to or address these issues; and
- Evaluate TJLP's consultation plan for subsequent consultation activities required with these Indigenous Groups during Application Review.

During the EA process, the EAO also requested that TJLP share a draft of the Application or specific chapters with certain Indigenous Groups prior to submission to the EAO for Application evaluation. During Application Review, the EAO also required TJLP to provide a draft version of the BVSA Report for the Working Group, including Schedule B and D Indigenous Groups, to provide feedback and comment prior to final submission of TJLP's BVSA Report.

Through the August 6, 2019 Section 13 Order that officially brought Schedule D Indigenous Groups into the EA. The Section 13 Order required TJLP to include an assessment of potential impacts of TMJ pursuant to CEAA 2012, and as directed by the EAO provide a response to comments received within specified timeframes or implement additional measures for consultation and accommodation of the Schedule D Nations. While the EAO led consultation with the Schedule D Indigenous Groups, TJLP also met with some Schedule D Indigenous Groups if requested by a Schedule D Indigenous Group.

13.0 POTENTIAL IMPACTS ON ABORIGINAL INTERESTS

The purpose of this section is to describe the current context and summarize the main issues heard across Indigenous Groups regarding the pathways of potential TMJ effects on Aboriginal Interests and is not intended to generalize impacts. The EAO's conclusions on the impacts to Aboriginal Interests specific to each Indigenous Group are included in Section 14 (Schedule B), Section 15 (Schedule C), and Section 16 (Schedule D) of this Report.

13.1 CURRENT CONTEXT AND CUMULATIVE EFFECTS

Throughout the TMJ EA, Indigenous Groups expressed concerns about the cumulative effect of historical, current, and foreseeable economic development on the Fraser River and the Salish Sea[163] environment. Many Indigenous Groups told the EAO that past and present economic development over the last 200 years is limiting their ability to meaningfully practice their Aboriginal Interests and Treaty Rights and interrupting their ability to pass on their Indigenous knowledge and culture to the next generation.

Many Indigenous Groups raised concerns about the cumulative effects of shipping traffic and the other cumulative effects of development in the lower mainland and the Salish Sea that are affecting the flora, fauna, and ecology of the region. Some Indigenous Groups told the EAO that the rate of development and the amount of marine shipping have rapidly increased over a short period of time.

[163] The EAO considers the Salish Sea to include the waters from the southern end of Johnstone Strait—near Campbell River—along the eastern shore of Vancouver Island, past Victoria, Vancouver and into Puget Sound to Seattle and Tacoma. It includes the Gulf Islands of Canada, and the San Juan group of islands in the United States. The EAO acknowledges that the name "Salish Sea" may not be the preferred term for this area by all Indigenous Groups.

Indigenous Groups consider that past and present development is contributing to:

- Declining fish stocks, in particular Fraser River salmon and other fish species;
- Poor health and premature death of Southern Resident Killer Whales;
- Reductions in the visual, acoustic, and spiritual quality of areas within their territories; and
- Greatly reduced access to and the quantity and quality of resources utilized for FSC purposes contributing to deep cultural impacts from the Indigenous perspective.

Many Indigenous Groups identified that future increases in development and vessel traffic, including increased traffic related to bunkering vessels under TMJ's BVS, could:

- Further limit their community members' access to fishing and harvest areas, including areas that would support shore-based or marine-based fishing, hunting, trapping and gathering in the area;
- Contribute to adverse effects to marine species from vessel noise or ship strikes from transiting TMJ vessels, or negative effects on fish habitat;
- Contribute to adverse effects to shoreline erosion due to TMJ vessel-related wake, and lead to potential impacts to cultural heritage and archaeology sites;
- Make the marine environment less safe for their members due to vessel wakes and an increased potential for collisions that would result in further interruptions to transmission of Indigenous knowledge and culture to younger generations.
- Introduce harmful chemicals or invasive species into the environment through ballast water discharges or biofouling from ships; and
- Contribute air and noise emissions, environmental impacts to vegetation or wildlife habitat, and changes to the visual landscape that would impact use of their traditional Territory and their sense of place within it.

Many Indigenous Groups noted that TMJ's effects would overlap with cumulative effects of shipping and restrictions on access to important cultural and harvesting sites. This could discourage their members' overall use of waterways in the lower Fraser River and the MSA area, leading to reduced harvests that would impact wellbeing, economic, cultural, and social structures within their respective communities. Tsawwassen First Nation, Musqueam Indian Band, Tsleil-Waututh Nation, Kwantlen First Nation, and Cowichan Nation Alliance felt that the appropriate baseline from which to assess effects would be prior to the arrival of European

settlers. Indigenous Groups also noted that fisheries management by DFO limits access to resources and ability to harvest for FSC purposes. Indigenous Groups told the EAO that combined cumulative impacts to fishing rights and a reduction in transmission of cultural practices to younger generations could result in a loss of Indigenous knowledge.

The EAO considers that the current context of the state of the environment includes the cumulative effects of past and present projects or activities, and that these factors are considered when determining "overall" levels of impact of TMJ (refer to Section 12.2 of Part C for more details). Further, the EAO considers that where the cumulative effects of past and present activities have negatively affected conditions today compared to those required for the meaningful practice of the right, the conclusion on effects from a current project on that right would be more serious. As the EAO did not conduct territory-wide assessments for each Indigenous Group for this EA, the EAO is not concluding on the current conditions or degree of cumulative effects throughout an Indigenous group's entire territory and how TMJ might interact with these. Rather, the EAO has considered cumulative effects within the scope of the EA, at the scale of the RAA and RSA.

The EAO also did not conduct a comprehensive regional cumulative effects assessment on all the various existing constraints and pathways of impact to Indigenous Groups, and considers that such a regional-level assessment would be beyond the scope of a project-specific EA. Notwithstanding this limitation, where TMJ effects intersect with known constraints and cumulative effects (e.g. see the paragraph below), the EAO has increased the "overall impact" conclusions based on information provided by Indigenous Groups to better inform decision makers on how cumulative impacts may be experienced by Indigenous Groups. The EAO notes however, that there is uncertainty around the precise degree to which the overall seriousness of impacts on rights is increased due to cumulative effects. This uncertainty is associated with the complexities in understanding conditions needed to meaningfully practice rights.

Cumulative effects can increase the seriousness of impact on rights assessment in a general manner across the entire assessment and specifically through increasing the seriousness of impact of certain "factors" noted in Section 12.2 above. As an example of the latter, in the Current Use of Lands and Resources for Traditional Purposes assessment of this Report (Section 11.4), the EAO concluded that for Indigenous Groups that prefer to fish in and around the TMJ site or in the shipping lanes, it is reasonable to expect that the impacts of past and existing activities on fishing would combine with TMJ effects to result in significant cumulative effects to some or all aspects of Current Use for fishing. These findings increase the relative importance of

the area to those Indigenous Groups who fish there and increase impacts to potential future use of the broader assessment area. Additionally, the findings increase the impact on the experience of practicing the right.

The EAO is aware that TJLP has committed to contribute up to $2 million to the First Nations Fisheries Legacy Fund (FNFLF) [164], which is a program led by several Indigenous Groups that supports recovery programs for Chinook salmon, eulachon and sturgeon in the Fraser River and Salish Sea[165]. The EAO understands that TJLP has developed the contribution proposal in response to concerns raised by Indigenous Groups, the EAO, and the Agency about the existing state of availability of salmon and other fish including eulachon and sturgeon in the Fraser River, as well as availability of Chinook salmon to Southern Resident Killer Whales, as their primary food source.

The EAO shared the memo about TJLP's proposal with the Working Group, posted the memo to EPIC, and sought feedback on the proposal from some Indigenous Groups. The EAO received a letter of support for TJLP's contribution proposal from the FNFLF, that established the role of the legacy fund as there to help facilitate matters of a broad concern but clarifying that the rights and the potential to infringe on rights is a bilateral approach with the rights Holder.

The EAO heard from Musqueam Indian Band that TJLP and Musqueam had worked collaboratively to determine appropriate mitigations despite having outstanding concerns with the EAO's approach to consultation and cumulative effects assessment, and that Musqueam views the proposal as an appropriate approach to contributing to the mitigation of some of the cumulative effects in Musqueam's territory, particularly considering the FNFLF's expertise in local habitat and restoration projects. Kwantlen First Nation identified that it does not feel that the proposed contribution reflects well to the scale, tenure, or potential impacts of TMJ, and it does not agree that the FNFLF would benefit the program.

[164] TJLP's proposal for Unconventional Offsetting Accommodation for Residual Project and Cumulative Effects, dated July 5, 2021 (https://www.projects.eao.gov.bc.ca/api/document/61099898cd98620022b0832b/fetch/20210707_TilburyJettyLimitedPartnership_UnconventionalOffsetProposal.pdf).

[165] The First Nations Fisheries Legacy Fund involves the following Indigenous Groups – Katzie First Nation, Kwantlen First Nation, kʷikʷəƛ̓əm (Kwikwetlem First Nation), Musqueam Indian Band, Tsawwassen First Nation, and Tsleil-Waututh Nation.

Tsawwassen First Nation identified a concern that TJLP's proposed contribution is being seen as something to mitigate a much larger scope of impacts than is possible given the scale of the proposal, the many project impacts/ risks it is potentially purporting to address, and the many groups within the FNFLF that may be competing for that funding contribution. Also, Tsawwassen First Nation suggested that the EAO provide an evaluation tool with costing and decision-making criteria to evaluate potential outcomes of the proposed contribution over life of TMJ. Kwantlen First Nation suggest that an offset measure should be either: 1) Tied to Project Revenue, or 2) Contributions should be made for the life of the project, since impacts are felt cumulatively and during the entire life cycle of the project. To this end, Kwantlen First Nation suggest that a $2 million contribution by TJLP every five years for the duration of the jetty would be more appropriate.

In its review of TJLP's proposed contribution, Tsleil-Waututh Nation determined that the proposal would not sufficiently address impacts on Tsleil-Waututh Nation's intangible cultural heritage and cultural health, advised the EAO to not recommend to decision makers that the proposal should be considered as adequate to mitigate, offset, or accommodation for TMJ's potential impacts to Tsleil-Waututh Nation's Aboriginal Interests, and that the EAO should remove all references of the proposal from the referral materials. Maa-nulth First Nations considered TJLP's proposal as not fulsome accommodation to TMJ's potential impacts to access.

In its review of TJLP's proposed contribution, Quw'utsun Nation and Ts'uubaa-asatx Nation raised concerns with the proposal, including that they would be excluded from participating in governance and decision-making with respect to the use of the funds. Ts'uubaa-asatx Nation requested that TJLP set up a contractual arrangement for the contribution to involve all Schedule B Indigenous Groups in decision-making. Quw'utsun Nation requested that TJLP set up a separate fund for all Indigenous Groups on Schedule B or one for the Quw'utsun Nation to implement stewardship and habitat restoration and activities given the Quw'utsun Nation's strength of claim to the project area. The EAO understands that Quw'utsun Nation is of the view that TJLP did not work collaboratively with the Quw'utsun Nation to determine appropriate mitigations and Quw'utsun Nation remains concerned with the proposal and views the proposal as narrowly inclusive of a few Indigenous groups.

The EAO considers the proposed contribution to the FNFLF as TJLP working towards fostering better long-term relationships with Indigenous Groups by supporting stewardship activities that are led by those specific Indigenous Groups, including fish habitat enhancement or continued

research in eulachon, sturgeon, and Chinook salmon. Based on feedback received from Indigenous Groups, the FNFLF, TJLP and WG members, the EAO is not recommending the financial contribution as a KMM under CEAA 2012 due to the limitations on effectiveness monitoring for indirect financial offsetting over the life of TMJ (minimum 30 years). The EAO has identified that the proposed contribution is relevant for decision makers to consider as part of the context when making their decision on TMJ.

13.1.1 EXISTING REGIONAL GOVERNMENT OF CANADA INITIATIVES

Canada promotes a safe, secure, efficient, and environmentally responsible marine transportation system, which may address some concerns related to the exercise of rights on the waterways. Marine shipping associated with TMJ would be required to meet the international standards and Canadian regulations set out by Canada's compliance-based marine safety and security system, which is designed to protect life, property, and the marine environment[166]. Compliance with those standards and regulations would be monitored and enforced through existing compliance and enforcement programs.

In addition to Canada's marine safety and security system, the EAO notes that several initiatives led by the Government of Canada are currently underway to collect habitat and monitoring information, implement management measures to address cumulative effects, and support capacity building by Indigenous groups to undertake studies and stewardship activities in the Salish Sea and lower Fraser River. Although these initiatives are not TMJ-specific, the EAO recognizes that these regional, and in some instances national initiatives, are working towards a better understanding of cumulative effects in the Salish Sea and lower Fraser River as well as taking actions to address cumulative effects, and are therefore considered relevant by EAO as important context for understanding regional cumulative effects. The following list of existing regional Government of Canada initiatives does not represent an exhaustive or formal region-wide inventory and the EAO acknowledges there may be additional initiatives related to cumulative effects management in the region that are not included. Also, the EAO understands that Indigenous Groups have raised concerns about a lack of municipal, provincial, and federal

[166] From the Canadian Coast Guard and Transport Canada re: Joint Oral Presentation for the May 28, 2019 Public Hearing Session – Marine Shipping – Roberts Bank Terminal 2 Project CEAR 1780 (https://iaac-aeic.gc.ca/050/evaluations/document/129851).

coordination in managing the cumulative effects of development in the Lower Mainland and the Salish Sea.

Descriptions of existing regional Government of Canada initiatives designed to collect baseline information to increase knowledge, address cumulative effects, foster Indigenous partnership with government or support stewardship initiatives are provided below. Additionally, measures developed as part of Canada's Indigenous consultation process for the TMX, intended to accommodate the potential for TMX to impact Aboriginal Interests or Treaty Rights are included below for their relevance:

- **British Columbia Salmon Restoration and Innovation Fund** (5-year contribution program; ending March 31, 2024)

Funded jointly by provincial and federal governments, this contribution program aims to support BC's fish and seafood sector, and to ensure the sustainability of wild Pacific salmon and other BC fish stocks. A current priority of the fund includes restoration, protection and maintenance of salmon populations and their habitats, including Fraser River steelhead, chinook, and Coho.

- **The Oceans Protection Plan (OPP)** (administered by TC, DFO, and ECCC)**:**

The OPP aims to develop a world class marine safety system, preserve, and restore marine ecosystems, build Indigenous partnerships, create a stronger evidence base and increase community participation and public awareness.

The first phase of the OPP (2016-2021) was a five-year plan with a $1.5 billion dollar investment, led by multiple federal departments, that focused on marine safety, environmental protection and working in partnership with Indigenous Peoples across Canada including the southern coastal BC region.

The next phase of the OPP received an investment of $2 billion over nine years, and is designed based on the lessons learned and engagement with Indigenous communities and organizations, as well as marine stakeholders, involved in or impacted by the OPP. In this next phase of the OPP, Canada will establish new measures to expand ocean protection initiatives to more regions and better proactively combat emerging threats to marine safety, while continuing or expanding existing initiatives. The renewed and expanded plan will help make further progress to enhance the protection and restoration of vulnerable marine ecosystems and wildlife; improve the efficiency, safety, and sustainability of Canada's marine supply chains and mitigate their impacts on the environment, including by advancing research on marine pollution, ecosystems, and wildlife; better manage marine traffic navigation off our coasts and marine incidents of all types; and advance partnerships

and training opportunities for Indigenous and coastal communities to incorporate their expertise and experiences in various aspects of marine safety and ecosystem protection.

Further information is available through the OPP website: https://tc.canada.ca/en/campaigns/oceans-protection-plan. Below are descriptions of specific OPP-related initiatives that overlap with the TMJ project area and are relevant to issues raised during the EA.

- **Cumulative Effects of Marine Shipping** (CEMS) (launched 2016); The CEMS Initiative under the OPP is undertaking a regional, activity-based cumulative effects assessment of marine shipping in partnership with Indigenous peoples in the south coast of B.C. The CEMS initiative is being delivered through a multi-tiered assessment approach with both a regional assessment and sub-regional assessments being undertaken within collaborative governance arrangements with various interested Indigenous Groups.

  At a regional level in the south coast, TC has partnered with the First Nations Fisheries Council (a partnership under the Commitment to Action and Results Accord) and established the Ship Movement Vessel Management Coordinating Committee (including ~18 different south coast BC First Nations). Sub-regionally, TC has co-developed, or is in the process of co-developing, collaborative governance arrangements (Terms of Reference and Living Workplans) with Indigenous groups).

  The CEMS assessments at both the regional level and the sub-regional level are collaborative in nature and as such, the scope (i.e., the parameters of the assessment) and timelines for the completion of specific activities and results are/were not prescribed. The scope of the regional assessment in partnership with the First Nations Fisheries Council and Ship Movement Vessel Management Coordinating Committee was co-developed through 2021. Sub-regionally, bilateral and collaborative engagement with Indigenous peoples to determine the scope of the assessment(s) is currently underway and will continue as per the workplans being developed directly with Indigenous groups. The collaborative identification of the scope of the assessments has been in part informed by views raised by Indigenous groups in environmental assessments including Roberts Bank Terminal 2, Tilbury Marine Jetty and Trans Mountain Expansion projects.

- **Community Partnership Funding Program** (CPFP): Short-term grants available (up to $5K maximum) to cover costs of activities and workshops for eligible Indigenous Groups and local communities to take part in developing and improving Canada's marine transportation system.

- **Coastal Environmental Baseline Program** (5-year initiative; launched 2016); includes funding to collect comprehensive data over 5 years on the state of 6 marine ecosystems in Canada, including the Port of Vancouver. DFO scientists are working closely with Indigenous and coastal communities in these areas to develop and implement the program and determine what data will be collected. By gathering comprehensive baseline data, changes in the environment can be better detected over time. Existing projects under this Canada-led initiative are occurring within the Port of Vancouver area, including the 3-year Fraser River Estuary Eulachon Migration Study and 4-year Port of Vancouver Ecosystem Characterization Project.

- **Coastal Restoration Fund** (5-year initiative; launched 2017 and fully allocated); The fund supports projects that help to restore coastal aquatic habitats, including 25 projects in the Pacific Region.

- The **Enhanced Maritime Situational Awareness** (EMSA) Initiative (EMSA) Initiative[167] (launched 2017) is a web-based geographic information system (GIS)launched as a pilot project under the OPP, and is being developed in partnership with Indigenous and coastal communities. This partnership includes all aspects of project governance, scope, and system development. In addition to 10 original pilot hosts, EMSA was extended as an accommodation measure for the TMX project adding three more pilot hosts (for a total of 13) and offering immediate access to EMSA, plus technical support and training for all impacted Indigenous communities along the TMX marine transit route. Highly successful as a pilot project, EMSA was renewed in the spring of 2022, and is now a steady

[167]Transport Canada – Enhanced Maritime Situation Awareness Initiative pilot projects. https://tc.canada.ca/en/marine-transportation/navigation-marine-conditions/enhanced-maritime-situational-awareness-initiative-pilot-projects[168] Transport Canada. 2021 management measures to protect Southern Resident killer whales. https://www.pac.dfo-mpo.gc.ca/fm-gp/mammals-mammiferes/whales-baleines/srkw-measures-mesures-ers-eng.html

state system. There are presently over 700 users of the EMSA system, approximately half of whom represent Indigenous communities, while other users include federal and provincial/territorial government staffs, BC Coast Pilots, port authorities, marine science organizations and the marine industry. This expanded base of perspectives greatly increases opportunities for collaboration in a wide range of marine safety and environmental monitoring and protection initiatives, including those under the OPP. EMSA provides access to over 1,300 layers of maritime information and data such as near real-time vessel traffic, weather, sensitive habitats, hydrography, and local information. By creating a common operating picture for Indigenous partners, coastal communities and stakeholders, the EMSA system supports collaboration in local and regional initiatives. This includes maritime situational awareness for vessel monitoring and safety; planning vessel routes; identifying sensitive areas; protecting the environment; and managing response to changes in vessel traffic volumes. Indigenous data governance and sovereignty, which includes Ownership, Control Access and Possession Principles, are foundational to the development of EMSA. Thirteen Indigenous pilot project host communities continue to work in partnership with TC to develop the system in close collaboration with the CCG.

- **The Whales Initiative:**

The EAO understands that Killer Whales hold a strong spiritual and cultural importance to many Indigenous Groups. The Government of Canada has stated that it is committed to protecting and supporting the recovery of endangered whales and is implementing measures to better understand and manage cumulative effects on the recovery of Southern Resident Killer Whales. The Whales Initiative, as well as additional measures targeted to support the protection and recovery of SRKW build on a strategy developed under OPP and aim to address imminent threats to SRKWs. For more information about the recent regulatory actions taken by the Government of Canada to protect SRKWs[168], and other

[168] Transport Canada. 2021 management measures to protect Southern Resident killer whales. https://www.pac.dfo-mpo.gc.ca/fm-gp/mammals-mammiferes/whales-baleines/srkw-measures-mesures-ers-eng.html

Whales Initiative activities see the Marine Mammals (Section 5.7) of Part B in this Assessment Report.

- **Vancouver Fraser Port Authority-led ECHO Program:**

The VFPA (an agent of the Crown that acts at arm's length from the government[169]) manages the ECHO Program that aims to better understand and reduce cumulative effects of shipping activities on at-risk whales throughout the southern coast of BC. For more information about ECHO program activities see the Marine Mammals (Section 5.7) of Part B of this Assessment Report.

- During the MSA, TJLP committed to incorporating contractual measures to support participation of TMJ-related vessels in the VFPA-led ECHO Program seasonal slowdown initiatives. The Application considered the voluntary measures of the ECHO program, if adhered to by vessels used in TMJ operations, would contribute to reducing cumulative effects on the disturbance and masking effects from threat of underwater noise and vessel strikes, but there was uncertainty in the effectiveness because the initiative relies on voluntary compliance.
- **Aboriginal Fund for Species at Risk (AFSAR; aquatic programming focused on aquatic species at risk and is delivered by DFO).** Currently open for 2021/2022 proposals, this federally funded initiative aims to support development of Indigenous capacity to participate actively in the implementation of Species at Risk Act (SARA), including improving habitat and addressing threats to the species; collaboration, information sharing and partnership between Indigenous communities, government and organizations and other interested parties, and support capacity within Indigenous communities to lead in the stewardship of species at risk and contribute to broader SARA implementation.

[169] *Canada Marine Act* S.C. 1998, c. 10. https://laws-lois.justice.gc.ca/eng/acts/c-6.7/FullText.html

- **Marine Spatial Planning** (MSP) (currently in the initial stages of pre-planning); MSP is a process in the South Coast of British Columbia that will bring together federal and provincial governments, Indigenous communities and organizations and stakeholders, to better coordinate human use across marine spaces to achieve ecological, economic, cultural and social objectives through collaborative governance, shared science, knowledge, and data, and analysis/planning in future phases. The MSP process will contribute to the advancement of reconciliation with Indigenous peoples through their involvement as partners in MSP and meaningful inclusion of Indigenous knowledge and Indigenous knowledge systems in planning, management, and decision-making, which will be foundational to the MSP process.
- **Government of Canada Trans Mountain Pipeline Expansion Project (TMX) Initiatives[170]:**

As a result of the consultation process that took place during the re-initiated Phase III consultations for TMX, the Government developed eight accommodation measures to address the concerns of potentially impacted Indigenous groups. These measures focus on building capacity and long-term relationships, marine safety, spill prevention, response capacity, cumulative effects, fish and fish habitat, and quieter vessels, as well as further terrestrial studies.

Additionally, the Canada Energy Regulator provided the Government of Canada with sixteen recommendations as well as amended conditions aimed to bolster marine safety, strengthen emergency response, protect oceans (including SRKW) and advance cumulative effects management. In addition to their objectives as accommodation measures, and the recommendations, the EAO considers the following TMX initiatives provide relevant context for understanding efforts that are being undertaken by the Government of Canada in response to concerns regarding impacts to Indigenous rights.

- **Salish Sea Initiative** (SSI) (5-year program; 2019 – March 2024; additional Arm's-Length Funding to support ongoing stewardship activities); SSI resulted from previous engagement and consultations with Indigenous Groups to co-develop an integrated monitoring, evaluation and reporting structure that is inclusive and responsive to

[170] Government of Canada. Trans Mountain Pipeline Expansion Accommodation Measures. https://www.canada.ca/en/campaign/trans-mountain/what-is-tmx/the-decision/backgrounder11.html

Indigenous Groups in the Salish Sea. The initiative will build capacity within the Indigenous Groups to enable the acquisition and reporting of data on baseline environmental conditions, tracking of environmental impacts and changes, assessment of cumulative environmental effects from human actions and determination of valued ecosystem components within the marine area of the Salish Sea. In addition, the Crown and Indigenous Groups will co-develop an Indigenous-led Investment Fund under a shared governance model to access long-term funding.

- **Co-Developing Community Response** (CDCR) (launched in 2019, with funding available to eligible Indigenous communities); Responds to concerns about risks of increased project-related tanker traffic to marine activities, the environment and culturally important and sacred sites within traditional territories by supporting the government and Indigenous communities to co-develop response capacity at the community level and foster a meaningful role for Indigenous communities in the broader marine response system.
- **Aquatic Habitat Restoration Fund**; (5-year program; launched May 2017 and beginning in 2021, further funding will be available for aquatic habitat restoration activities through until 2024); Responds to concerns about potential impacts to cumulative effects from development projects, including assisting in the maintenance and restoration of fish and fish habitat in watersheds along the TMX pipeline corridor, including inland watersheds in British Columbia and Alberta, the Fraser River watershed and in the Salish Sea and increasing capacity within communities to protect and restore aquatic habitats that may be impacted by cumulative effects of development through encouraging an ecosystem-based management approach.
- **Enhanced Maritime Situational Awareness**; **(EMSA)** is a web-based GIS which was launched in 2017 as a pilot project under the OPP and is being developed in partnership with Indigenous and coastal communities. For more information on this initiative, please refer to the descriptions of OPP initiatives above.

- **Marine Safety Equipment and Training** (MSET); (5-year program; Launched in October 2020 and accepting applications from eligible Indigenous communities until June 2024 for activities to be completed by March 2025). MSET responds to concerns regarding the safety of Indigenous mariners who may face increased interactions with TMX-related vessels along the TMX marine shipping route, including interactions faced while pursuing traditional activities. MSET provides funding to Indigenous communities for equipment to enhance the safety of certain Indigenous vessels and for training to build understanding around safety on the water. Indigenous communities located along the TMX marine shipping route are eligible to participate in MSET.
- **Quiet Vessel Initiative** (QVI) (5-year program; 2020 – 2024; This initiative is testing safe, environmentally-responsible, and effective quiet vessel technologies retrofits, designs and operational practices to reduce noise in the Salish Sea. It aims to protect the marine environment and vulnerable marine mammals — including the SRKW. Indigenous communities located along the TMX marine shipping route are eligible for consideration for QVI funding. Eligible Indigenous communities along the TMX marine shipping route can seek funding for projects to address their concerns about the impacts of underwater vessel noise on the marine environment, such as (non-exhaustive):
    - Researching or testing projects to evaluate "quiet" technologies on marine vessels;
    - Underwater noise monitoring to assess the effectiveness of operational and technical mitigations aimed at addressing underwater noise; and
    - Capacity building activities to further develop groups' science capacity related to the underwater radiated noise impacts and mitigations.
- **TMX Recommendations:**

In response to the National Energy Board (now the Canadian Energy Regulator (CER)) TMX Recommendation 1, the Government of Canada (DFO and ECCC) is enhancing knowledge to support cumulative effects assessment and management in the Salish Sea by 1) taking stock of the current state of knowledge, 2) identifying gaps in understanding ecosystem components of value and concern, 3) enhancing research and monitoring on water quality, air quality, and air emissions; and 4) improving access to this knowledge through tools such as an interactive maps or other publicly available open science and data platforms related to cumulative effects. Collectively, this will enhance regionally based cumulative effects assessment and management by Indigenous and local communities from the perspective of

their values and knowledge. Specific initiatives, such as MSP, SSI, and the TMX Marine Bird Monitoring and Conservation Program (Recommendation 3) are the primary programs linked to TMX Recommendation 1; however, additional links can be made to the OPP and the Whales Initiative, among others. Currently, work is also underway to inventory existing programs, datasets, publications, and tools that are relevant to the Salish Sea.

The CER TMX Recommendation 2 recommends public reporting on the oversight, progress, and status of measures to address cumulative effects, which is closely linked to Recommendation 1. In response the Government of Canada is assessing current reporting gaps, which will be used to inform appropriate levels of reporting and next steps. This work aligns with corresponding initiatives, notably the Salish Sea Initiative and marine spatial planning for the Salish Sea. Work is underway to inventory existing reporting related to the health of the Salish Sea Ecosystem including investigation of on-line user-friendly interfaces (e.g., Cumulative Effects Open Science Data Portal). The Government of Canada has launched the 'Sharing Knowledge on Cumulative Effects in the Salish Sea Ecosystem' webpage[171], which provides links to datasets, publications, and tools that can be used by Indigenous Groups and local communities.

13.1.2 THE EAO'S CONSIDERATION OF EXISTING REGIONAL GOVERNMENT OF CANADA INITIATIVES

The EAO considers that the existing regional initiatives described above are working towards a better understanding of cumulative effects in the Salish Sea and Fraser River, as well as taking actions to manage these effects. Some initiatives relate to better understanding and managing cumulative effects to ecosystem health or the recovery of SRKW, while others are related to developing and implementing tools to make navigation safer for Indigenous mariners and fishers. These initiatives are relevant to the assessment of impacts on Aboriginal Interests resulting from TMJ's contribution to cumulative effects of marine shipping. Together, the EAO views that the existing regional initiatives represent substantial government efforts to respond to cumulative effects issues in the Salish Sea and concerns of Indigenous people. The initiatives

[171] Government of Canada. Sharing Knowledge on Cumulative Effects in the Salish Sea Ecosystem. https://www.canada.ca/en/environment-climate-change/services/cumulative-effects/salish-sea-ecosystem/sharing-knowledge.html

provide avenues for Indigenous people to work with Canada to manage cumulative effects beyond the EA of TMJ.

Tsleil-Waututh Nation, Quw'utsun Nation, Pacheedaht First Nation and T'Sou-ke First Nation raised concerns that such initiatives of the Crown do not constitute TMJ-specific mitigations under CEAA 2012 and should not be weighed in the evaluation of TMJ mitigations and residual effects. Tsawwassen First Nation identified a concern that TJLP's proposed contribution is being seen as something to mitigate a much larger scope of impacts than is possible given the scale of the proposal. Musqueam Indian Band commented that the initiatives led by TC, or any of the other Federal initiatives, would not likely meaningfully reduce the risk of impacts to Musqueam fishers in a manner that would avoid or compensate for cumulative impacts on Musqueam fishing rights. The EAO views this information as relevant to decision-makers whose interests include both reconciliation and considering existing land use objectives, which establish government direction or desired outcomes for a range of natural resource values. As mentioned above, the EAO views the existing initiatives as an illustration of the efforts that are being undertaken by the Crown in relation to past and future impacts that contribute to the "current state" within the territories of many of the Indigenous Groups[154].

The EAO understands that Indigenous Groups have highlighted the OPP and SSI as steps in the right direction but that that adequate funding of these initiatives is uncertain, and that consultation and engagement activities are ongoing. The EAO heard from Maa-nulth First Nations that most of the initiatives are at an early stage of development or implementation, and that access to adequate, long-term, and more stable funding is needed[172]. Maa-nulth First Nations told the EAO that in Maa-nulth First Nations' view the SSI-related governance model for the $50 M arms length fund would be unlikely to provide long-term support because the funding would be split by 33 First Nations. In their review of TJLP's BVSA Report, Snuneymuxw First Nation identified that the Government of Canada initiatives would be limited in ability to accommodate for TMJ-related impacts to Snuneymuxw First Nation's Aboriginal Interests.

The EAO understands that the Government of Canada has heard through consultation with Indigenous groups that engaging fully in each of the initiatives taking place in the region can be challenging and resource intensive. Maa-nulth First Nations identified that the large number of

[172] The EAO notes that these views were shared prior to Canada's announcement of a second phase that would see the Oceans Protection Plan extended for nine years.

initiatives and COVID-19 pandemic has made it difficult to meaningfully engage in all of regional initiatives. Additionally, the EAO understands that the Canada has heard concerns about the effectiveness and future outcomes of programs given the various stages of implementation, scope, and duration of funding. The EAO acknowledges, that while the outcomes of this work have yet to be realized, the ongoing collection and analyses of targeted data with Indigenous communities will support informed decision-making and the development of potential measures to manage cumulative effects moving forward. The EAO understands that the federal Crown has stated that it is committed to working with Indigenous people in shaping the initiatives to better understand and manage cumulative effects in the Salish Sea and Fraser River.

When applicable, the EAO has further indicated where specific engagement activities through existing regional Government of Canada initiatives may be particularly relevant as additional context to the assessment of impacts on Aboriginal Interests and Treaty rights resulting from TMJ's contribution to regional cumulative effects from marine shipping.

13.2 CONCERNS RAISED BY INDIGENOUS GROUPS

13.2.1 RELIANCE ON INFORMATION FROM ROBERT'S BANK TERMINAL 2 AND TRANS MOUNTAIN EXPANSION

Tsleil-Waututh Nation, Musqueam Indian Band, Pauquachin First Nation, T'Sou-ke First Nation, Scia'new First Nation, Maa-nulth First Nations, Esquimalt First Nation and Quw'utsun Nation raised concerns about the reliance on information from the RBT2 and TMX assessment processes, including using this information to understand baseline conditions in the MSA. Indigenous Groups criticized the status of these sources of information used in the MSA, including that some of the information was incomplete, out of date, may not be directly applicable for assessing impacts from TMJ-related shipping activities, and/or contained sensitive Indigenous use information that may not be appropriate to use between EAs.

The EAO acknowledges that Indigenous knowledge must be used with appropriate permissions and according to the governance, laws, policies, and practices of the Indigenous Group. When requested by Indigenous Groups, the EAO is open to different approaches relating to the management and utilization of sensitive Indigenous knowledge, while ensuring the requirements of Provincial law and principles of administrative fairness are met throughout and beyond the EA. The EAO considers the TMX and RBT2 processes as recent EAs in the region that

have considered marine shipping in the Salish Sea, including the Strait of Juan de Fuca. These processes provide substantial baseline information on existing conditions along B.C.'s south coast and completed assessments, including a review of regional cumulative effects associated with shipping. Therefore, the EAO is of the opinion that the publicly available information provided by Indigenous Groups for the assessment of shipping effects in the Salish Sea is relevant to inform the assessment of TMJ shipping effects. The EAO understands that the concerns raised by Indigenous Groups regarding TMX and RBT2 do not necessarily reflect all concerns pertinent to TMJ. During the MSA process, the EAO offered to share a high-level summary of key concerns relevant to the marine shipping component of TMJ based on information provided by Indigenous Groups for TMX and RBT2 processes for review and feedback, or followed up through dialogue about specific concerns related to TMJ or the consultation process for the MSA.

Several Indigenous Groups stated that it was inappropriate to rely on proponent-generated reports for a process that is still underway (at the time TJLP submitted the MSA to the EAO, the RBT2 panel report had not yet been issued). Some of the Indigenous Groups noted that concerns were raised regarding those reports in the RBT2 process that have yet to be addressed. Maa-nulth First Nations identified gaps in the RBT2 reports, including inadequate modelling of potential accidents and malfunctions, and told the EAO that where applicable, those gaps should have been addressed in the EA for TMJ. Indigenous Groups requested that the MSA should be based on new studies or information specific to TMJ. The MSA information request[173] required TJLP to use information from these projects and complement it with additional information from the RBT2 panel hearings and any information provided by Indigenous Groups. TJLP explained that the MSA considered publicly available reports and comments that were submitted through the RBT2 Panel hearings, updating data where appropriate. Further, comments and concerns raised by regulators and Working Group members during the panel review were reviewed and considered when incorporating RBT2 information. Following TJLP's submission of the MSA, the EAO continued to seek the additional views of Indigenous Groups and the Working Group, and has made a number of changes to its decision materials as a result of this input, supplementing the information considered from the RBT2 panel report.

[173] Marine Shipping Supplemental Assessment – Information Request for WesPac Tilbury Marine Jetty Project. Issued by the EAO on November 15, 2019.

In its review of the EAO's draft assessment report, Snuneymuxw First Nation raised a concern that the EAO relied on publicly available data from the TMX and RBT2 assessments to assess impacts to Aboriginal Interests. Snuneymuxw First Nation did not participate in the RBT2 assessment and identified that the information provided by Snuneymuxw First Nation for the TMX assessment (i.e., written evidence for the NEB hearing in 2016; and comments on the TMX reconsideration in 2018) was not specific to the project or the MSA and was collected several years prior. In their review of TJLP's BVSA Report, Snuneymuxw First Nation also identified that by not being able to adequately assess TMJ-related marine shipping impacts to Snuneymuxw First Nation's Aboriginal Interests leaves significant gaps in understanding for the TMJ EA process. The EAO understands that the concerns raised by Snuneymuxw First Nation that the TMX processes may not necessarily reflect all concerns pertinent to TMJ; however, the EAO considers the TMX Panel Review and Reconsideration processes as recent EAs in the region that have considered marine shipping in the Salish Sea, and that information from these processes provide substantial baseline information on existing conditions along BC's south coast, and therefore, the EAO is of the opinion that the publicly available information provided by Snuneymuxw First Nation for the assessment of shipping effects in the Salish Sea is relevant to inform the assessment of TMJ shipping effects. Snuneymuxw First Nation understands that the EAO will use publicly available information from Indigenous Groups to inform their assessments; however, Snuneymuxw First Nation is of the view that the information related to TMX is contextually inappropriate for TMJ.

Given the publicly available information, and the information received by the EAO through consultation with Indigenous Groups during the EA for TMJ, the EAO is of the opinion that it has sufficient information to understand the key pathways to impacts to Aboriginal Interests for the purposes of the EA. The EAO does not dispute Indigenous Groups' worldviews and perspectives that the current conditions in the lower Fraser River, and in some areas of the Salish Sea, do not currently support the practice of cultural activities in their preferred manner. The EAO acknowledges there is some uncertainty associated with the EAO's conclusions on the overall potential seriousness of impact from TMJ (i.e., TMJ effects combined with cumulative effects) on Aboriginal Interests. The level of uncertainty in the EAO's conclusions is affected by multiple factors, including the extent of the EAO's understanding of the locations where Indigenous Groups practice their Aboriginal Interests, and the complex relationship between incremental increases in shipping from TMJ-related vessels and existing cumulative effects to Aboriginal Interests. As described in the Current Use of Lands and Resources for Traditional Purposes and Cultural Heritage Section 11.4 of Part B, the EAO found it is reasonable to expect that past effects would combine with effects from TMJ-related marine shipping to result in significant cumulative effects to current use for fishing and other cultural use of marine areas for

Indigenous Groups that preferentially use or rely on sites located at TMJ or within and adjacent to shipping lanes.

13.2.2 SCOPE OF THE MARINE SHIPPING ASSESSMENT

Tsleil-Waututh Nation, Maa-nulth First Nations, Pacheedaht First Nation, Ditidaht First Nation, Pauquachin First Nation, Esquimalt First Nation, T'Sou-ke First Nation, and Scia'new First Nation requested the scope that the MSA extend out to the 200 nm exclusive economic zone (EEZ) as opposed to the 12 nm limit of Canada's territorial sea. Maa-nulth First Nations proposed scoping the assessment to 200 nm for a variety of reasons, including language in CEAA 2012 referencing the EEZ and federal jurisdiction within the EEZ. Indigenous Groups identified concern that the EA did not characterize potential TMJ-related residual or cumulative effects from marine shipping to SRKW, air quality, or accidents and malfunctions beyond the 12 nm in Canada's EEZ. Tsleil-Waututh Nation and T'Sou-ke First Nation also expressed that the scope of the MSA does not include all SRKWs critical habitat; therefore, in their view the effects would be underestimated due to impacts to SRKWs in Canada's EEZ.

The EAO considered the 12 nm territorial limit an appropriate scope for the assessment of impacts of marine shipping for the following reasons:

- *Potential interactions:* An interaction between a TMJ-related vessel and an environmental or human receptor has the greatest likelihood of occurring within the area encompassing the 12 nm limit because most of these receptors are located closer to shore and this is also where the greatest probability and consequence of a marine incident would be because of the presence of navigational hazards, and vessels and environmental receptors are constrained within a smaller area.
- *Predicting potential effects:* The ability to predict environmental effects from marine shipping is unreliable beyond 12 nm because it is not clear where vessels will be located, nor the speeds at which they will be travelling; and
- *Enforcement:* Promoting or enforcing compliance conditions outside of established shipping lanes (12 nm boundary) is limited because vessel movements are less well known.

For the reasons outlined above and in consideration of the predicted residual effects within the assessed project areas and the measurability and enforceability of potential conditions, the EAO determined that the 12 nm territorial limit was adequate for understanding potential effects due to shipping.

13.2.3 CLIMATE CHANGE AND IMPACTS FROM UPSTREAM NATURAL GAS EXTRACTION ACTIVITIES

During the EA of TMJ, Indigenous Groups including Tsawwassen First Nation, Kwantlen First Nation and Tsleil-Waututh Nation, Maa-nulth First Nations, and Esquimalt First Nation identified concerns about impacts of TMJ to increased GHG emissions, upstream activities related to natural gas extraction and climate change. Kwantlen First Nation provided their concerns about potential TMJ-related impacts to climate change, including fugitive GHG (including methane) emissions and increased demand for extraction of upstream natural gas (Section 14.4 of Part C of this report). Tsleil-Waututh Nation provided their concerns and assessment of potential TMJ-related impacts to climate change to Tsleil-Waututh's Cultural Health and Right to Practice Culture and Tsleil-Waututh Fisheries and Rights to Fish (see Section 14.9 of Part C of this Report). Tsleil-Waututh Nation considers that TMJ-related contributions to climate change would be likely to have very high and irreversible impacts on Tsleil-Waututh Nation's health, cultural practices, cultural health and right to fish. As described in the GHG Management of Part B (Section 5.2), TJLP is of the view that TMJ would help lower provincial, national and global GHG emissions by supporting the transition from higher carbon intensity fuels used in marine shipping or for power generation to lower carbon intensity. TJLP asserts that TMJ is aligned with provincial CleanBC Roadmap, as it provides critical infrastructure to enable the use of LNG as an alternative to conventional marine fuel and with a ready supply of lower-carbon LNG from B.C., TMJ can support the decarbonization of the shipping industry.

Tsleil-Waututh Nation has expressed views that the assessment was inadequate with respect to upstream GHG emissions, cumulative effects assessment and the Application's "No Project Case" Scenario. While outside their territories, Maa-nulth First Nations expressed concern about the environmental impacts of fracking and that upstream and downstream activities should be considered when assessing a project. Esquimalt First Nation and Maa-nulth First Nations expressed concerns about the cumulative effects of GHG emissions from marine shipping and told the EAO that any increase in GHG emissions from a major project such as TMJ is significant, given the current GHG emission levels and their resulting impact on climate change. The EAO understands that Esquimalt First Nation and Maa-nulth First Nations disagree with the EAO's non-significance conclusions for cumulative effects of GHG management for TMJ.

Tsawwassen First Nation, Tsleil-Waututh Nation, Maa-nulth First Nations and Malahat Nation (in addition to the City of Richmond and Metro Vancouver) requested that TMJ offset its GHG emissions. Tsleil-Waututh Nation requested that GHG emissions be compared to municipal, provincial, and federal climate targets and that TJLP provide further information on how it

intends to support the IMO targets of reducing GHG emissions. During the EA, Kwantlen First Nation also requested that mitigations be put into place to prevent fugitive emissions of methane, ongoing monitoring for GHG emissions throughout the life of TMJ and for decision makers to also consider the potential for impacts to climate change from upstream natural gas extraction activities and incentivizing renewable-energy projects compared to approving fossil fuel projects. During the review of TJLP's BVSA Report and regarding TMJ's BVS, Kwantlen First Nation and Tsawwassen First Nation raised concerns related to the upstream effects from LNG production, and Ts'uubaa-asatx Nation identified a concern that TMJ would lead to an increase in GHG emissions.

As described in the GHG Management of Part B (Section 5.2), the EAO considers upstream GHG emissions outside the scope for TMJ, and the EAO's characterization of effects did not consider upstream GHG emissions as part of a determination of significant adverse environmental effects in federal project reviews nor the EAO's characterization of effects and determination of significance of project effects on GHG emissions. The EAO acknowledges that the IPCC has confirmed that GHG emissions are at levels that are impacting the global climate and has produced several scenarios projecting potential global GHG emissions trajectories and the potential impacts associated with these emissions levels. As such, the EAO did not require TMJ's Application to include a cumulative effects assessment for GHG emissions and the EAO did not conduct a cumulative effects assessment for the same reasons.

The EAO recognizes that the impacts of GHG emissions must be addressed globally, and that it is not possible to estimate the impacts of an individual project's emissions on global climate change. However, the EAO also recognizes that B.C.'s GHG reduction targets were established in the context of the best western science to reduce global GHG emissions to address impacts on global climate change, and that it is B.C.'s responsibility to contribute to the global reduction. As such, individual projects are considered in relation to their contribution to provincial and national emissions (see Section 5.2 in Part B for more information).

In consideration of the EAO's recommended provincial conditions and KMMs recommended under CEAA 2012, as well as the conservative nature of the predicted effects, the EAO concludes in Section 5.2 that TMJ would not have significant adverse effects on GHG Management.

The EAO is of the view that the issues discussed are adequately resolved for the purposes of the EA and does not propose any related conditions specific to GHG offsetting. The EAO does not currently require GHG offsetting because the province has legislated GHG reduction targets, a plan for GHG reductions (CleanBC), sectoral emission targets for 2030, and a wide variety of regulatory tools to help achieve these targets. The EAO notes that the IMO is the organization

responsible for regulating international shipping GHG emissions. The EAO is also proposing Condition 20: GHG Reduction Plan, and recommending KMM under CEAA 2012 for an Air Quality Management Plan, which would be developed in consultation with, and reviewed by Indigenous Groups CAS, BC OGC, ECCC, Metro Vancouver, and HC (see Section 5.2 of Part B of this report for more information). The EAO is of the view that together, these proposed mitigation measures would help to reduce adverse effects from TMJ to GHG management, which includes triggers and corrective actions.

13.3 ISSUES RAISED BY INDIGENOUS GROUPS AND POTENTIAL IMPACTS ON ABORIGINAL INTERESTS

The EAO sought input from Indigenous groups on the nature and scope of their Aboriginal Interests and how they might be impacted by TMJ. The MSA relied on publicly available information through the RBT2 and TMX processes.

A summary of potential impacts and issues raised during the EA is provided below. Key issues raised during the EA are described in each Indigenous Group's section of Part C of this Report.

The EAO considered the assessment of impacts to the VCs in Part B of this Report that contribute to understanding of effects on Aboriginal Interests (biophysical; geospatial; and social, cultural, and experiential values). How the assessment of relevant VCs was generally considered in relation to impacts on Aboriginal Interests is discussed in the sections below.

13.3.1 POTENTIAL IMPACTS ON FISH, FISH HABITAT AND CONCERNS ABOUT FISHING RIGHTS RAISED BY INDIGENOUS GROUPS

The EAO's evaluation of potential effects on fishing rights considers impacts to biophysical components that may result in changes in fish quantity and quality; changes in access to fishing sites; and changes to the experience or cultural and spiritual elements associated with, fishing that are attributable to TMJ, including cumulative effects. The pathways of potential effects to Indigenous Groups fishing rights are outlined below; specific issues raised by each Indigenous Group and the EAO's conclusions on impacts of TMJ to Aboriginal Interests or Treaty Rights of individual Indigenous Groups are included in the sections that follow below (Section 14 for Schedule B Indigenous Groups; Section 15 for Schedule C Indigenous Group; and Section 16 for Schedule D Indigenous Groups).

Biophysical Components:

The EAO concluded that TMJ would result in residual adverse effects to fish, potentially including vulnerable populations of salmon, eulachon and white sturgeon and fish habitat. The residual effects include habitat loss and alteration from the marine facility (i.e., piles), dredging, vibrodensification and scour protection (note the latter would be within the dredge pocket); and potential harm to fish, including change in fish behaviour due to underwater noise during in-water works and injury or mortality due to machinery and vessels during construction and operations. The EAO did not predict residual effects to fish or fish habitat in the MSA area.

Indigenous Groups raised concerns that the TMJ site is in an area of the Fraser River that has been impacted by past industrial activity and that many fish species of cultural importance are facing a variety of conservation risks at various life stages. Quw'utsun Nation, Musqueam Indian Band, Tsawwassen First Nation, Kwantlen First Nation, Tsleil-Waututh Nation, Pauquachin First Nation, Esquimalt First Nation, Malahat Nation, Pacheedaht First Nation, Ditidaht First Nation, Scia'new First Nation, and Maa-nulth First Nations raised concerns about the historical impacts to fish stocks and habitat and some considered the current state of these components insufficient to practice their traditional way of life in their preferred manner. Indigenous Groups raised a variety of concerns including impacts to habitat, concerns about noise, vibrations and entrainment impacts from pile driving and the capital dredge and effects of the maintenance dredge on fish.

Indigenous Groups, including Tsawwassen First Nation, Musqueam Indian Band, Tsleil-Waututh Nation, Quw'utsun Nation, Kwantlen First Nation, Ts'uubaa-asatx Nation, Pauquachin First Nation, Scia'new First Nation, Pacheedaht First Nation, T'Sou-ke First Nation, Ditidaht First Nation, Katzie First Nation and Maa-nulth First Nations identified traditionally important food fish that were, and in some cases are currently, fished in the Salish Sea and the South Arm of the Fraser River:

- **Salmon:** Salmon was identified by Indigenous Groups as an important traditional and principal food source which is connected to their health, wellbeing, life, language, culture, stewardship, economic and governance systems, and that they continue to harvest for FSC purposes as well as commercial harvests. Indigenous Groups raised several concerns regarding salmon and the potential impact TMJ could have on their fishing rights in the Salish Sea and the Fraser River. Indigenous Groups noted that the Fraser River salmon species are declining in spawning population numbers and returning as smaller fish than previous years. Fewer and smaller fish increase their fishing effort and make having an adequate harvest during the limited DFO fisheries openings critical for the success of their FSC and commercial fisheries. Indigenous Groups consider any

increase in the potential for injury or mortality of salmon as a result of TMJ activities concerning.

- Musqueam Indian Band and Tsleil-Waututh Nation stated that TMJ dredging activities would occur in important and productive fish habitat and TMJ could adversely impact habitat for juvenile sockeye and chinook salmon. Additionally, Indigenous Groups noted concern for the potential effects on fish, such as salmon, from underwater noise due to construction and marine shipping. Musqueam Indian Band, Kwantlen First Nation, Squamish First Nation, Malahat Nation and Tsawwassen First Nation pointed out that anthropogenic noise could affect salmon, and fish generally, in a variety of adverse ways, including behaviour and direct mortality.

  The EAO is recommending KMMs under CEAA 2012 for Fish Mitigations to Reduce Harm and Mortality. Measures include conducting in-water work activities during reduced risk windows identified by DFO (unless authorized by DFO), undertaking monitoring for fish presence prior to pile driving and dredging, criteria and triggers to modify or stop in water works due to fish presence, and seasonal restrictions during operations on hydraulic suction and clamshell dredging to avoid entrainment of juveniles, including salmonids. To mitigate effects to fish from underwater noise during in-water works, mitigations include monitoring underwater noise, use of vibratory pile driving as the primary driving method, the use of sound attenuation devices (e.g. bubble curtains) during impact pile driving when vibratory pile driving is not technically feasible and the use of ramp up technique for pile driving.

  Sturgeon: Kwantlen First Nation, Quw'utsun Nation, Ts'uubaa-asatx Nation, Tsawwassen First Nation, Musqueam Indian Band and Tsleil-Waututh Nation noted the cultural importance of sturgeon to their communities. Musqueam Indian Band, Tsawwassen First Nation and FLNRORD noted that the TMJ area is used by sturgeon for holding and rearing, and that dredging activities might attract sturgeon and other fish into the area exposing them to higher risk of propeller strikes.

  In response, TJLP submitted two supplemental reports on sturgeon that reviewed additional literature sources and considered tracking data provided by FLNRORD and provided additional clarification and commitments on mitigation measures for sturgeon. Tsawwassen First Nation also submitted a literature review, providing evidence that vessel movements and dredging can injure and kill sturgeon in riverine environments, such as the Fraser River. Tsawwassen First Nation emphasized that the cumulative effects of threats to sturgeon (including but not limited to habitat loss and degradation, dredging, gravel mining, fisheries bycatch, and vessel strikes) are at best hindering

population recovery and at worst causing a population decline. FLNRORD noted vessel strikes were not considered a main threat to sturgeon and that although population-level effects are unlikely, agreed with Indigenous Groups that the loss of a large, sexually mature female would have a greater effect on the population than the loss of a juvenile, and there is limited information with respect to the interaction of sturgeon with vessels and dredge equipment.

The EAO is recommending a KMM under CEAA 2012 for a Fish Mitigations to Reduce Harm and Mortality. In addition to the mitigations noted above, The EAO is recommending that side scan sonar surveys of the dredge footprint be conducted immediately prior to the start or restart of pile driving and dredging to determine sturgeon presence and acoustic and vibratory fish deterrent measures (e.g., ramp up – gradual starting of machinery) to reduce risk or entrainment and harm. Additionally, the EAO is recommending that side scan sonar be required once the dredge pocket has been established to inform sturgeon occupancy mitigations. TJLP would also be required to record and report any observations of sturgeon mortality at the Marine Terminal Area, and report to DFO and Indigenous Groups on whether further mitigation is appropriate.

- **Eulachon:** Tsawwassen First Nation, Musqueam Indian Band and Ts'uubaa-asatx Nation noted that eulachon might spawn in the lower Fraser River and around the TMJ site. Given eulachon's importance for FSC purposes to Indigenous Groups, Tsawwassen First Nation requested an eulachon spawning study be conducted to inform the EA about if eulachon spawning occurs in the LAA as it does in the RAA as well as further review of literature and field research.

  In response to the concerns raised, TJLP completed additional eulachon spawning habitat characterization in the spring of 2020 and an in-river eulachon spawning assessment during the 2021 spawning season to address uncertainty in the potential for eulachon spawning habitat within the proposed dredge area. The spawning assessment was conducted in collaboration with Tsawwassen First Nation and Musqueam Indian Band to assess for the presence of eulachon spawning in the dredge area and documented a total of 16 eggs during the 45-day monitoring period. TJLP explained that the eggs were from drift from upstream, as eulachon spawning would be marked by much higher levels of eggs. Based on the physical and biological information collected, TJLP concluded that habitat within the dredge area is low suitability spawning habitat due to the combination of the salt wedge, lack of suitable spawning substrate, elevated flow velocities that can occur during the spawning period, and lack of direct evidence of

spawning. Further, TJLP concluded that current usage of the dredge area by adult eulachon is temporary and largely limited to the period of migration movements to upstream spawning locations.

Musqueam Indian Band communicated that, despite the area being determined as low suitability spawning habitat by TJLP based on the survey, it is still important to maintain marginal eulachon spawning areas because these sites would be used for eulachon spawning at times when eulachon are more abundant in the Fraser River (at present the eulachon populations are at a historically low levels). Musqueam Indian Band requested that the EAO include Musqueam's assessment of the potential suitability of the area for future eulachon spawning, which is based on Musqueam traditional ecological knowledge.

The EAO is recommending KMMs under CEAA 2012 for the Fish Mitigations to Reduce Harm and Mortality, and Fish Habitat Offset Plan. In addition to the mitigations noted above, there would be seasonal restrictions during operations on hydraulic suction and clamshell dredging to avoid entrainment of juveniles, including eulachon.

TMJ is required to be constructed and operated in accordance with all applicable statutory and regulatory requirements of the *Fisheries Ac*t, and other federal, provincial, or municipal legislation, regulation, or policies (See the Fish and Fish Habitat (Section 5.6) in Part B). The Application proposed a habitat offset for the direct habitat loss associated with the TMJ footprint. Indigenous Groups requested the offsetting plan aim to exceed the value (amount and quality) of habitat lost and a net gain in fish and invertebrate productivity. Indigenous Groups requested that they be involved in the collaborative development of the plan and that it be reflective of lessons learned from other offset plans in the region. Tsleil-Waututh Nation requested that the offset habitat be compared to existing viable habitat and not to habitat that has already been degraded. The EAO proposes a key mitigation under CEAA 2012 for a Fish Habitat Offset Plan to offset impacts to fish habitat from TMJ.

DFO has clarified that dredging and scour protection would result in a harmful alteration, disruption or destruction ("HADD") of habitat and would likely require authorization under the *Fisheries Act*. The scope of works that would require the authorization and habitat offsetting requirements would be determined during DFO's regulatory review process, should an EAC be issued. The Fish Habitat Offset Plan would identify means to ensure offsetting habitat would provide a higher value than the fish habitat it is replacing, monitoring to assess effectiveness of the offsetting measures, and contingency measures and associated monitoring measures that

would be put into place if the offsetting measures are not successful in offsetting the residual loss or impacts on fish habitat resulting from TMJ.

The EAO heard concerns from many Indigenous Groups, including Musqueam Indian Band, Tsleil-Waututh Nation, Tsawwassen First Nation, Quw'utsun Nation, Kwantlen First Nation, the People of the Rivers Office on behalf of the S'ólh Témexw Stewardship Alliance, Malahat Nation, Pauquachin First Nation, Scia'new First Nation, Pacheedaht First Nation, T'Sou-ke First Nation, Ditidaht First Nation, and Maa-nulth First Nations about TMJ potentially contributing to cumulative effects on fish and fish habitat in the Salish Sea and the Fraser River, and disagreement with TJLP's conclusion that there would be no residual cumulative effects to fish and fish habitat. The EAO conducted its own cumulative effects assessment based on its own conclusions of predicted residual effects to fish and fish habitat loss and alteration, behaviour disturbances from underwater noise and injury from TMJ. The EAO concluded that with mitigations, there would not be significant cumulative effects from the interaction of TMJ with other existing and reasonably foreseeable projects. The EAO is recommending a KMM under CEAA 2012 for Fish Mitigations to Reduce Harm and Mortality, as described above in this section. These mitigations would contribute to reducing TMJ contribution to cumulative effects to fish and fish habitat.

The EAO understands that Indigenous communities have strong connections to the marine environment in the Salish Sea and Fraser River and are stewards of the lands and waters. As described in Section 13.1.1, there are many existing regional Government of Canada initiatives available to support Indigenous groups to undertake stewardship activities and improve the understanding of environmental and cumulative effects in the Salish Sea, and to a relatively lesser extent the lower Fraser River. These programs include the Cumulative Effects of Marine Shipping (CEMS), Whales Initiative, Aquatic Habitat Restoration Fund, the Coastal Environmental Baseline Program, the Aboriginal Fund for Species at Risk, and the Salish Sea Initiative, for example. Additionally, programs that are contributing to our understanding of current environmental context and environmental and cumulative effects in the Salish Sea include the implementation of the TMX Recommendations 1 and 2, and the Marine Spatial Planning (MSP) process. Although these initiatives are not TMJ-specific, the EAO recognizes that these programs are working towards a better understanding of cumulative effects in the Salish Sea and lower Fraser River as well as taking actions to address cumulative effects and are therefore considered relevant by EAO as important context for understanding regional cumulative effects on the environment. The EAO is aware that TJLP has committed to contribute up to $2 million to the First Nations Fisheries Legacy Fund[75], which is a program led by several Indigenous groups that supports recovery programs for chinook salmon, eulachon

and sturgeon in the Fraser River and Salish Sea. For more information about the EAO's consideration of TJLP's contribution proposal in see Section 13.1 on Current Context and Cumulative Effects in Part C.

Geospatial Components (places, sites, and access):

The EAO acknowledges that access to the marine terminal area would be disrupted throughout construction and that Indigenous mariners and fishers would avoid entering and remaining in the marine terminal area due to the warning signs and notifications as part of the terminal's marine safety protocol regarding elevated public risk, in particular when vessels would be berthing, loading, or de-berthing at TMJ.

- Some communal Indigenous fisheries licensed by DFO in the lower Fraser River occurring downstream of the Port Mann Bridge[174] may occur in the marine terminal area, including drift and set-net Chinook FSC harvesting.
- Tilbury Island, including the TMJ site, is considered to be an important fishing area by Indigenous Groups depending on the time of season or other variables that may change year to year.

The EAO acknowledges Indigenous Group's concerns regarding existing constraints on access to fishing, not attributable to TMJ, which affect the right to fish such as:

- DFO prohibitions or limitations on harvesting white sturgeon, eulachon, and Chinook salmon;
- DFO licensed openings are limited in duration, and Indigenous fishers are given short notice of when openings will occur; and
- Current vessel traffic levels have the potential to disrupt or stop Indigenous fishing activities.

For the purpose of the EA, TJLP's Application scenario estimates a maximum of 137 vessels (LNG carriers and bunker vessels) per year calling on the jetty, resulting in 274 trips (inbound and outbound) annually, equivalent to approximately one vessel call every three days. During Operations, TJLP predicts (based on 2018 projections) that operational LNG carrier and barge vessels for TMJ could increase large vessel traffic transiting the Southern Arm of the Fraser River up to the TMJ site by approximately 6.5 percent[112]. Vessel movements are anticipated to

[174]Government of Canada – Fraser River Indigenous fisheries archived reports. https://www.pac.dfo-mpo.gc.ca/fm-gp/fraser/archive-indigenous-autoch-eng.html.

be 236 annual vessel movements in the MSA because approximately 19 bunkers would be used regionally for bunkering and would not travel through the shipping lanes. TJLP estimated the increase in vessel traffic associated with TMJ within segments of the MSA, and anticipated that TMJ would only represent an increase of 0.5 percent in Segment A , a 0.2 percent increase in Segment B, and a 1.1 percent increase in Segments C and D of the total vessel movements relative to existing conditions (please see Figure 15 in the Land and Marine Resource Use Section 8.2). See Section 13.3.1.1 below for more information on the EAO's assessment potential impacts to Aboriginal Interests under the BVS.

With respect to the potential effects of TMJ-related vessel traffic, the EAO acknowledges that Indigenous Groups' access to marine harvesting areas (i.e., fishing, crabbing, and other marine-based gathering activities) could be periodically disrupted for short duration by transiting TMJ-related vessels during construction and operations. The EAO agrees with TJLP's assessment that TMJ-related vessel wakes are predicted to be within the natural variation of wave heights in the Fraser River and the Salish Sea.

Interactions between TMJ-related vessels and Indigenous fishers that could disrupt access to fishing may include:

- Periodic requirements to adjust course during transit to and from fishing sites to avoid TMJ-related vessels as per the Collision Regulations in the Fraser River and MSA area; and
- Potential temporary disruption of fishing activities due to passing vessels and their wake, including removing fishing gear to avoid gear damage or loss or personal injury, in the Fraser River and to a lesser extent in the MSA area.

These effects to access are considered to apply broadly, and to varying degrees, to all Indigenous Groups within the original Application area and the MSA area. As described in the Current Use of Lands and Resources for Traditional Purposes in Section 11.4, the EAO predicts that TMJ-related vessel transits would have negligible to low magnitude effects to access to fishing compared to baseline numbers of vessel transits, that could be experienced as higher in the Fraser River compared to Salish Sea. The EAO also concludes in the cumulative effects assessment section of Part B assessment on Current Use, that it is reasonable to expect that past effects on access to and quality of experience of fishing would combine with TMJ effects to result in significant cumulative effects to these sub-components of current use for Indigenous Groups that fish at the TMJ site or preferentially within the shipping lanes. Please see Section 13.1 of Part C for information about current context and cumulative effects as it relates to the EAO's assessment of potential impacts on Aboriginal Interests.

To avoid or reduce disruptions to marine access and use to the TMJ site, Original Application Area and MSA area, the EAO is recommending KMMs under CEAA 2012 for a Marine Access and Transportation Plan from the TMJ site to Sand Heads and a Marine Communication Plan for shipping out to 12 nm. The Marine Access and Transportation Plan would include a description of mitigations to reduce disruptions caused by construction and operations for members of Indigenous Groups to carry out traditional use activities that have been identified and communicated by Indigenous Groups to TJLP in relation to this or other relevant plans. The Marine Communication Plan would include procedures to inform Indigenous Groups of traffic schedules, for Indigenous Groups to submit any feedback on potential adverse effects of TMJ-related vessels and for TJLP to respond in a timely manner.

As described in Section 13.1.1, there are current regional Government of Canada programs and initiatives relevant to cumulative impacts to the ability of Indigenous Groups to safely access fishing areas. MSET provides funding to eligible Indigenous communities for equipment to enhance the safety of certain Indigenous vessels and for training to build understanding around safety on the water. EMSA helps coastal Indigenous communities better plan vessel routes, identify sensitive areas, enhance local marine safety, and protect the environment. CEMS Initiative is studying the effects of marine shipping on the environment and coastal communities. The Traffic Separation Scheme Feasibility Study is looking at the impacts of changing the marine shipping lanes and how this has and could affect fishing activities in the Salish Sea. However, the EAO acknowledges that these programs are broad in nature and are not intended to mitigate or accommodate for the specific potential impacts to Indigenous mariners and fishers navigating in proximity to TMJ vessels within the established Traffic Separation Scheme of the Salish Sea or main navigational channel in the lower Fraser River. The federal Crown has stated that it is committed to working with Indigenous people in shaping the initiatives to better understand cumulative effects in the Salish Sea, support informed decision-making, and the development of potential measures to manage cumulative effects by the ongoing collection and analyses of targeted data with Indigenous communities.

Social, Cultural, Experiential Values:

The EAO heard from Musqueam Indian Band, Tsawwassen First Nation, Tsleil-Waututh Nation, Pauquachin First Nation, Maa-nulth First Nations, Esquimalt First Nation, Tsartlip First Nation[175], Kwantlen First Nation, Quw'utsun Nation, Ditidaht First Nation, and the People of the River Referral Office on behalf of their member Nations of the importance of fishing to their cultural

[175] As noted in the WesPac Marine Shipping Assessment.

identity and the transmission of their culture including language to younger generations. Based on submissions for the RBT2 and TMX hearings, input during the TMJ EA, and the EAO's previous assessment work, the EAO recognizes the importance of fishing to the culture of all Indigenous Groups.

With respect to social, cultural, and experiential values associated with fishing, the EAO understands that many Indigenous Groups are concerned about potential TMJ effects from:

- Reduced visual quality from TMJ-related vessel presence on the seascape and while at berth;
- Noise and visual effects from construction such as pile driving and capital dredging and operation activities such as ship transits and maintenance dredging;
- Concern about potential TMJ contributions of contaminants or invasive species that could affect t he quality of harvested foods, resources, and the ecosystem;
- Reduced or missed opportunities for intergenerational knowledge transfer due to passing vessels disrupting fishing activities;
- Safety concerns from wake from passing TMJ-related vessels and the potential for accidents with smaller Indigenous fishing vessels; and
- Concerns around the consequences of an accident or malfunction at the TMJ jetty and/or for LNG carriers and bunker vessels while in transit.

As outlined in the Current Use and Noise and Visual Effects sections of Part B of this Report, the EAO is of the opinion that the visual and acoustic changes as a result of TMJ are not likely to be substantially different than the existing acoustic and visual conditions adjacent to the TMJ site (i.e., within the LAA as outlined in the Application). As such, the EAO has concluded that noise and visual effects during construction and operations (when LNG carrier vessels are at berth) would have negligible to low level effects, depending on the location of the viewer/listener.

The EAO proposes conditions which include the Lighting Management, Noise and Vibration Management as part of the CEMP and OEMP, an Air Quality Management Plan, a Greenhouse Gas Reduction Plan, and a Water Quality Management Plan, and recommends KMMs under CEAA 2012 for an Air Quality Management Plan and Marine Access and Transportation Plan. Additionally, the EAO proposes provincial Condition 17: Indigenous Cultural Awareness, Recognition and Mitigation. This condition states that TJLP must offer opportunities to Indigenous Groups on Schedule B in the lower Fraser River to lead or support activities such as ceremonies, executing cultural protocols, transmission of knowledge or language, recognizing cultural heritage and providing cultural awareness training to TMJ employees.

The EAO appreciates that some Indigenous people may find the presence and sounds of the Jetty or LNG vessels disturbing for safety and/or aesthetic reasons, or for other personal reasons. The EAO acknowledges Indigenous concerns that noise and visual disruptions and concerns about safety could then lead to reduced opportunities for cultural transmission, including Indigenous language acquisition by younger generations while undertaking traditional harvesting activities on land or on the water, and in particular, while fishing. As described in the Land and Marine Use Section of Part B (Section 8.2), the EAO acknowledges that Indigenous mariners and fishers would avoid entering into and remaining in the marine terminal area due to the warning signs and notifications regarding elevated public risk, in particular when vessels would be berthing, loading, or de-berthing at TMJ. During the EA for TMJ, the EAO heard from several Indigenous Groups regarding the importance of transmission of culture through harvesting activities, which could be interrupted due to TMJ, and that the disruptions to cultural transmission are not only about passing vessels, but the existence of those vessels, which would deter Indigenous people from going to that location to begin with. As described in Section 13.1.1, there are current regional Government of Canada initiatives relevant to cumulative impacts to the ability of an Indigenous Group to safely practice fishing and the quality and experience of fishing. For example, MSET initiative provides funding to eligible Indigenous communities for equipment to enhance the safety of certain Indigenous vessels and for training to build understanding around safety on the water. The EMSA initiative helps coastal Indigenous communities better plan vessel routes, identify sensitive areas, enhance local marine safety, and protect the environment. The EAO notes beyond MSET and EMSA, other initiatives including CEMS, CDCR and the OPP's CPFP may collectively reduce effects within the region. However, these initiatives are not intended to mitigate or accommodate for the potential impacts to Indigenous mariners and fishers navigating in proximity to TMJ vessels within the established Traffic Separation Scheme of the Salish Sea or the main navigational channel of the lower Fraser River. The EAO understands that the federal Crown has stated that it is committed to working with Indigenous people in shaping the initiatives to better understand cumulative effects in the Salish Sea and lower Fraser River, support informed decision-making, and the development of potential measures to manage cumulative effects by the ongoing collection and analyses of targeted data with Indigenous communities.

The potential impact of TMJ on the right to fish for each Indigenous Group is described in Section 14 to 16 of this Report.

13.3.1.1 POTENTIAL IMPACTS ON ABORIGINAL FISHING RIGHTS UNDER THE BUNKERING VESSEL SCENARIO AND ISSUES RAISED BY INDIGENOUS GROUPS

13.3.1.1.1 The EAO's methods for assessing potential BVS-related changes to pathways of impacts to Aboriginal fishing rights

Using methods consistent with Section 12.2, the EAO assessed for potential impacts associated with the TMJ BVS using the following pathways of effects to impacts for the biophysical, geospatial, and other social, cultural, or experiential components of Aboriginal fishing rights, which were previously identified for TMJ in Section 13.3.1 of Part C:

- **Biophysical** – residual and cumulative effects, including fish habitat loss and alteration from the marine facility, dredging, vibrodensification and scour protection; change in fish behaviour due to underwater noise during in-water works; and injury or mortality due to machinery and vessels during construction and operations as potential pathways of effects impacts.

- **Geospatial** – residual and cumulative effects to access, including disruptions to the marine terminal area throughout construction; avoidance of the marine terminal area during operations due to warning signs and notifications regarding elevated public risk; and disruptions to access to fishing during operations due to TMJ-related vessel traffic for those Indigenous Groups that fish at TMJ site or preferentially within the shipping lanes.

- **Social/Cultural/Experiential values –** residual and cumulative effects to noise and visual quality during construction, or visual quality during operations when vessels are berthed at the jetty and in transit; and the experiential quality of current use for fishing impacting those Indigenous Groups that fish at TMJ site or preferentially within the shipping lanes.

For assessment of potential BVS-related impacts to Aboriginal fishing rights from TMJ, the EAO evaluated for any potential changes associated with those residual effects listed directly above, and how those changes would affect the level of EAO's seriousness determination for impacts to Aboriginal Interests. In addition to potential changes to residual effects relevant to the BVS, the EAO also considered potential changes to cumulative effects in its assessment of potential BVS-related impacts to Aboriginal fishing rights. This included consideration of the fishing component of Current Use of Lands and Resources for Traditional Purposes (Section 11.4), including the EAO conclusions that it is reasonable to expect that past and future effects on fish

and fish habitat, access to fishing and the experience of fishing would combine with TMJ effects to result in significant cumulative effects for those Indigenous Groups that fish preferentially at the TMJ site or in the main navigational channel in the South Arm of the lower Fraser River (see Section 11.5.4.2 for details). Also see Section 13.1, or individual Indigenous Group sections of Part C, for more details on the EAO's approach to the consideration for TMJ-related residual effects, combined with the existing significant cumulative effects, in its assessment for potential impacts to Aboriginal Interests, where relevant.

In the preparation of the EAO's assessment for the BVS in Part C of this Report, the EAO relied on TJLP's BVSA Report, which considered the additional bunker vessel calls on the jetty, using the same geographic scope as the Application (i.e., jetty to Sand Heads), as well as advice provided by Indigenous Groups and the Working Group on the BVSA report. With respect to the BVSA, the EAO did not assess for potential BVS-related impacts within the MSA area because TJLP identified that the BVS is not anticipated to affect the number of vessels in the MSA (see Section 2.2.2 of Part A for details). Also, with respect to the BVSA, the EAO did not assess for potential BVS-related impacts to Aboriginal Interests that would be expected to result from potential effects to harm to fish due to changes in fish behaviour in response to underwater noise, or to the Noise VC due to TMJ-related vessel activities. These specific residual effects were not included in the Part C assessment for the BVS because the EAO does not anticipate that the BVS would result in any changes to the EAO's conclusions on these specific residual effects from what was assessed in the original Application Scenario. This approach is consistent with the Part B chapters on Fish and Fish Habitat (Section 5.6) and Noise (Section 6.2) presented in this Report.

13.3.1.1.2 Potential BVS-related changes to pathways of impacts to Aboriginal fishing rights

In the Fish and Fish Habitat chapter of Part B (Section 5.6), the EAO identified that the BVS may result in potential changes to the residual effect on injury and mortality of fish due to the increased chance of vessel strikes from TMJ-related bunker vessel traffic during operations. With respect to potential harm to fish due to vessel strikes, TJLP stated that an increase in TMJ-related bunker vessel transits may increase the risk of vessel strikes on white sturgeon; however, this effect is not predicted to result in population-level changes to white sturgeon in the Fraser River. TJLP noted that, compared to LNG carriers, bunker vessels would have propellers above the bottom of the vessel or shrouded propellers and reduce the amount of time propellors would spend rotating near the bottom of the dredge pocket, thereby reducing potential risk of harm to sturgeon on the riverbed within the navigation channels but may still pose a risk to sturgeon present within the mid-water column and at the surface. The EAO

acknowledges there is some uncertainty associated with the potential risk of harm or mortality to white sturgeon due to vessels strikes, including the interaction with vessel class and fish size. The EAO captured this associated uncertainty in the confidence rating in the conclusions in Part B of this Assessment Report (see the Fish and Fish Habitat Section 5.6 for more details).

Proposed mitigations for potential residual effects to Fish and Fish Habitat include mitigations to reduce impacts to noise and visual quality in the CEMP and OEMP, as well as the recommended KMMs under CEAA 2012 for the Fish Mitigations to Reduce Harm and Mortality, and Fish Habitat and Offset Plan. In Part B of this Report, the EAO predicts that with mitigations and offsetting measures for TMJ, there would be non-significant residual cumulative effects on Fish and Fish Habitat from the interaction of TMJ with other past, present, and reasonably foreseeable future projects and activities. The EAO acknowledges there is some uncertainty in the significance conclusion related to the absence of established threshold and recovery strategies or action plans in place for the species assessed, and uncertainties around proposed mitigation measures for foreseeable projects capable of contributing to future cumulative adverse effects.

In its assessment of potential BVS-related impacts in Part C, the EAO also considered whether the BVS resulted in any changes to residual effects on fisheries resources, access, and quality of experience for the fishing component of Current Use of Lands and Resource for Traditional Purposes, and how any changes to residual effects on the fishing component of Current Use might affect the level of EAO's seriousness determination for TMJ's potential impacts to Aboriginal fishing rights in Part C. To this end, the EAO identified that under the BVS, potential changes to residual effects relevant to access and quality of experience for fishing component of Current Use were related to marine user avoidance of the marine terminal area; interruptions to access to FSC fishing areas in the lower Fraser River; visual quality, and changes to real or perceived safety risks associated with interactions between TMJ-related vessels and Indigenous harvesters in the lower Fraser River, and to a lesser extent out to Sand Heads.

For the TMJ site, as described in the Current Use (Section 11.4) chapter of this Report, the EAO predicts that Indigenous fishers would avoid entering and remaining in the marine terminal area during operations due to the warning signs and notifications regarding elevated public risk due to LNG berthing, loading and de-berthing activities (on average, one vessel call or two vessel movements a day in the BVS). The EAO considered that this would result in a continuous frequency of effect to the avoidance of the marine terminal area. As described in the BVSA, TJLP states that although a greater number of vessels would call to TMJ under the BVS, the bunker vessels would require less time to berth, load, and deberth compared to the LNG carriers. As described in the Land and Marine Resource Use (Section 8.2) chapter of this Report,

at the scale of the LAA and RAA, the EAO predicts the effects to access within the TMJ site would be low in magnitude no matter what operating scenario is considered.

For vessels in transit, TJLP's BVSA Report stated that bunker vessels would be self-propelled and more maneuverable resulting in less time obstructing the navigational channel and other portions of the river, compared to the LNG carriers that would require escort tugs. With respect to the BVS, TJLP has identified that because the potential interaction between Indigenous Groups fishing access would occur more frequently, but for shorter periods of time compared to the scenario presented in the Application, TJLP concluded effects from additional bunker vessel traffic are expected to be consistent with the findings of the Application. In its assessment for effects to Current Use of Lands and Resources for Traditional Purposes (Section 11.4), the EAO concludes that under either of the operating scenarios presented by TJLP (original Application or BVS), the potential for TMJ's residual effect to access for the fishing component of Current Use would be negligible to low in magnitude due to regularly occurring vessel transits (on average one vessel call per day under the BVS) to and from TMJ's marine terminal area. However, as described in the Current Use chapter of this Report (Section 11.4) the EAO predicts that under the original Application Scenario these residual effects would likely result in relatively infrequent and short-duration interruptions to access and quality of experience for fishing, but under the BVS these effects would have a potential for higher frequency of interactions between Indigenous Groups and TMJ-related vessels in the lower Fraser River during some specific FSC fisheries windows.

The EAO heard from Indigenous Groups and DFO that some of the DFO-regulated FSC fisheries windows in the Fraser River are only open for extremely short periods of time during the season. For example, the openings for communal FSC fishing for Chinook salmon below the Port Mann Bridge by drift- and set-net ranged between 6-11 hours per opening, with five or six openings occurring during the 2020 season depending on the Indigenous Group[176]. In consideration of the current restrictions on, and limited opportunities available for, FSC harvesting in the lower Fraser River by Indigenous Groups, the EAO predicts that under the BVS, potential interactions between TMJ-related vessels in transit and Indigenous Groups conducting FSC fishing in the lower Fraser River could potentially have a greater effect on access to fishing during FSC fisheries windows (see Section 11.4). Proposed mitigations to avoid or reduce

[176] Government of Canada – Fraser River Indigenous fisheries archived reports, Lower Fraser River license opening times (Communal licenses) for "2020". Available at: https://www.pac.dfo-mpo.gc.ca/fm-gp/fraser/docs/archiv-reports-rapports/indigenous-autochtone/LFOpenings/2020COM-eng.pdf. Accessed May 26, 2022.

interruptions to in-river FSC fishing activities due to TMJ-related vessels include mitigations to reduce impacts to noise and visual quality in the CEMP and OEMP, as well as the recommended KMMs under CEAA 2012 specifically for Marine Communications, Marine Access and Transportation, and Vessel Traffic Management Plans. These plans would be developed in consultation with Indigenous Groups, and identify procedures of communication with Indigenous Groups, and mitigations to reduce potential disruptions for Indigenous harvesters and mariners to carry out traditional use activities including fishing for FSC purposes.

In the BVSA, TJLP stated that the analysis in the Application was based on a larger vessel size with greater potential for visual impacts, and that the reduced frequency of LNG carriers combined with the increased frequency of bunkering vessels is not anticipated to result changes to the assessment of Visual Quality compared to what was originally assessed in the Application. It is also noted that since the bunker vessels are smaller and more maneuverable than the larger LNG carriers; therefore, associated with comparably fewer safety concerns due to the smaller size of the bunker vessels and reduced spatial and temporal disruption to Indigenous fishing vessels.

The EAO acknowledges that some Indigenous people may find LNG vessels disturbing for safety and/ or aesthetic reasons or for other personal reasons both at the TMJ site and from TMJ-related vessels in transit. The EAO also notes that under the *Collision Regulations,* FSC harvesters are required to remove nets to allow for larger vessels, including TMJ-related vessels, to transit through the main navigational channel of the Fraser River, and established commercial shipping lanes. The EAO also acknowledges Indigenous concerns that noise, visual disruptions, and concerns about safety could then lead to reduced or missed opportunities for cultural transmission including Indigenous language acquisition by younger generations while undertaking traditional harvesting activities on land or on the water.

In the Visual Quality (Section 8.3) chapter of this Report, the EAO predicts that TMJ would have negligible to low level effects on visual quality due to increases in daytime visibility components at the TMJ site and temporary visibility of marine vessel movements, and nighttime visibility of TMJ's lighting at the site and navigation lighting from marine shipping vessels. The EAO predicts that the magnitude of the residual effect on visual quality would depend on the location of the viewer, with it reasonable to expect that the magnitude of effect would increase the closer one is to the terminal area or a vessel in transit. The EAO also concludes that residual visual quality effects would be continuous at the TMJ site, and frequent for vessels in transit, for both the Application scenario and BVS.

A summary of pathways of effects to impacts to Aboriginal fishing rights for TMJ and relevant residual effects anticipated to change under the BVS is contained in Table 32 below.

Table 32. Summary of pathways of effects to impacts to Aboriginal fishing rights for Tilbury Marine Jetty and changes under the Bunkering Vessel Scenario.

The pathways of effects to impacts to Aboriginal fishing rights considered by the EAO in its impacts assessment of the Application scenario for Tilbury Marine Jetty	Potential changes to residual effects relevant to pathways of effects to impacts to Aboriginal fishing rights for Tilbury Marine Jetty that may change under the Bunkering Vessel Scenario
Biophysical – residual and cumulative effects fish habitat loss and alteration from the marine facility, dredging, vibrodensification and scour protection; change in fish behaviour due to underwater noise during in-water works; and injury or mortality due to machinery and vessels during construction and operations as potential pathways of effects impacts.	**Biophysical –** Harm to fish injury or mortality due to vessels during operations. Under the BVS, the EAO predicts there could be increased chance of vessel strikes from TMJ-related bunker traffic, but the effect is not predicted to result in population-level changes to white sturgeon, and the EAO considered uncertainty in the confidence rating in its conclusions in Section 5.6 of Part B.
Geospatial – residual and cumulative effects to access, including disruptions to the marine terminal area throughout construction; avoidance of the marine terminal area during operations due to warning signs and notifications regarding elevated public risk; and disruptions to access to fishing during operations due to TMJ-related vessel traffic for those Indigenous Groups that fish at TMJ site or preferentially within the shipping lanes.	**Geospatial** – Under the BVS, there would be a potential for higher frequency of short-duration interactions resulting in disruptions to access to fishing for those Indigenous Groups that fish in the South Arm of the lower Fraser River during operations due to regularly occurring TMJ-related vessel movements (average of one vessel call per day). The EAO does not predict a change in the residual effects to access from avoidance of the marine terminal area during operations due to warning signs and notifications regarding elevated public risk, which was already considered to be a continuous for the life of the project.
Social/Cultural/Experiential values – residual and cumulative effects to noise and visual quality during construction, or visual quality when vessels are berthed at the jetty and in transit; and the experiential quality of current use for fishing impacting those Indigenous Groups that fish at TMJ site or preferentially within the shipping lanes.	**Social/Cultural/Experiential values** – The EAO did not predict any change in residual effects to visual quality when vessels are berthed at the jetty and in transit; and effects to experiential quality for current use for fishing impacting those Indigenous Groups that fish at TMJ site or preferentially within the shipping lanes compared to what was originally assessed under the Application Scenario.

While the EAO is of the view that the potential impacts on Aboriginal fishing rights have been avoided, minimized, and accommodated to the extent possible for the purposes of the EA, the EAO also recognizes that there are outstanding impacts, in particular cumulative effects, and these outstanding impacts are reflected in the EAO's conclusions in this Assessment Report. The EAO also notes that there is some uncertainty when considering how cumulative effects impact Aboriginal Interests, especially since the EAO did not conduct a comprehensive regional

cumulative effects assessment on all the various existing constraints and pathways of impact to Indigenous Groups, which is considered beyond the scope of the EA for TMJ.

13.3.1.1.3 Concerns raised by Indigenous Groups during review of TJLP's BVSA report

According to TJLP's ACR-4, Indigenous Groups raised several key issues and concerns during their review of TJLP's draft BVSA Report. Several Indigenous Groups, including Quw'utsun Nation, Tsawwassen First Nation, Kwantlen First Nation, Musqueam Indian Band, Snuneymuxw First Nation, Tsleil-Waututh Nation, and Ts'uubaa-asatx Nation identified a concern with the increased vessel traffic associated with the BVS. Kwantlen First Nation, Musqueam Indian Band, and Ts'uubaa-asatx Nation identified concerns that the increased vessel traffic may have a negative effect on fish, and Kwantlen First Nation identified a concern about long-term cumulative effects on fish and fish habitat in the Fraser River from future expansion of the Project.

TJLP also heard from Musqueam Indian Band and Ts'uubaa-asatx Nation concerns about the Project contribution to cumulative effects in the area, and that for Musqueam Indian Band the increased vessel traffic presents potential safety issues and a direct impact on Musqueam's ability to harvest fish and other rights-based activities in the area. Ts'uubaa-asatx Nation raised concerns that TJLP's BVSA Report does not include a socio-economic assessment, and that under the BVS the Project could have effects on vegetation, cultural heritage and archaeology sites, noise, GHGs, and wildlife habitat.

During review of TJLP's BVSA Report, Esquimalt First Nation, Scia'new First Nation, and Maa-nulth First Nations expressed an interest in understanding the potential effects that increased bunker vessel traffic would have on the distribution of vessels in the MSA area and to the marine species that use the Fraser River watershed, which are important for either their cultural interests (e.g., SRKW), or fishing rights (e.g., salmon). These Indigenous Groups expressed a desire to participate in the bunker vessel scenario assessment on this basis and asked that the scoping of the BVSA reflect their participation.

- As described in Section 13.1.1.1 above, the EAO did not assess for potential BVS-related impacts within the MSA area because TJLP identified that the BVS is not anticipated to affect the number of vessels in the MSA (see Section 2.2.2 of Part A for details).

- As described in Part B chapters on Fish and Fish Habitat (Section 5.6) and Marine Mammals (Section 5.7), the EAO completed an assessment for any predicted changes to its characterization of residual and cumulative effects under the BVS. The EAO identified that, under the BVS, there could be increased chance of vessel strikes from TMJ-related bunker traffic compared to the original Application scenario, but that the change in the effect is not predicted to result in population-level changes to fish, including white sturgeon.

- The EAO invited those Indigenous Groups on Schedule B and D to participate in the review of TJLP's BVSA Report, including participation in Working Group meetings, and consideration of any views or feedback provided in the EAO's updates to the referral materials based on the review of TJLP's BVSA Report.

Concerns related to potential BVS-related changes to fish, fish habitat, and Aboriginal fishing rights

During the review of TJLP's BVSA Report and at Working Group meetings related to the review of TJLP's BVSA Report, Indigenous Groups raised concerns that under the BVS there would be potential for increased negative effects to fish and fish habitat and juvenile recruitment of white sturgeon and eulachon; increased risk of vessel strikes on sturgeon; and changes in the use of the Fraser River watershed by marine species that are important to their Aboriginal Interests (e.g., salmon). The EAO captured these BVSA-related issues in its assessment on Fish and Fish Habitat in Section 5.6 of this Report.

As described in the Fish and Fish Habitat chapter of this Report (Section 5.6), the EAO is of the view, despite lack of consensus on this point with some Indigenous Groups, that for both TJLP's Application scenario and BVS, TMJ would not be expected to result in any residual effects to fish behaviour due to underwater noise from marine shipping. The EAO understands that the underwater noise levels from vessel activities associated with TMJ are predicted to be consistent with the existing level of underwater noise that is already experienced in this section of the Fraser River, and the information on TMJ's potential acoustic effects has been sufficient to enable the EAO to conclude that underwater noise from vessel traffic associated with TMJ is within normal ranges of other marine activities, and effects to fish and fish habitat from TMJ-related vessel noise would not be measurable.

During the review of TJLP's BVSA Report, the EAO also heard concerns from Indigenous Groups, including Tsleil-Waututh Nation, Ts'uubaa-asatx Nation, Tsawwassen First Nation, and Snuneymuxw First Nation about the increase in vessels from 137 annual calls at the jetty to up to 365 annual vessel calls, and that under the BVS there would be increased risk of vessel strikes to white sturgeon due to increased bunker vessel traffic associated with TMJ. In their review of the draft federal conditions for TMJ, Snuneymuxw First Nation identified that the proposed mitigation measures for sturgeon seemed limited for mitigating potential impacts due to vessel strikes during operations. Maa-nulth First Nations also identified concern that the increased vessel traffic associated with the BVS could impact culturally important species, like SRKW and Salmon, that use the Fraser River watershed. The EAO acknowledges that there is some uncertainty associated with the potential risk of harm or mortality to sturgeon due to vessels strikes, including the interaction with vessel class and fish size, and is of the view that the EAO has adequately captured the uncertainty in the confidence rating in the conclusions in the section on Fish and Fish Habitat in Part B of this Report (Section 5.6).

- The draft provincial conditions and recommended KMMs under CEAA 2012 are designed to prevent or reduce potential effects on sturgeon, including monitoring for sturgeon prior to sensitive in-water works (e.g., dredging) using side-scan sonar techniques, and recording/ reporting any observations of sturgeon death, injury or vessels strikes occurring within the Designated Project area (i.e., the Marine Terminal Area shown in Figure 1.0 of the Certified Project Description for TMJ).

- Also, the EAO considers that the draft provincial conditions and recommended KMMs under CEAA 2012 are adaptive, because for any observed vessel strikes, TJLP would be required to have a qualified professional determine whether modified or additional mitigation measures are necessary to protect sturgeon from vessel strikes related to the Designated Project.

Indigenous Groups also identified concerns around effects on commercial fishing enterprise of commercial First Nation harvesters and identified interest in better understanding the potential effects that increased bunker vessel traffic would have on the distribution of vessels in the MSA. Through the working group forum, Indigenous Groups also requested further information on the current bunkering scenario in the Port of Vancouver and the VFPA's role in regulation of bunkering activities. In response to this request, the EAO coordinated an information session for the TMJ Working Group on April 12, 2022, where representatives from the VFPA presented information about LNG as a marine fuel and current bunker operations in the Port of Vancouver.

Concerns regarding uncertainty related to assumptions considered in TJLP's BVSA Report

During the review of TJLP's BVSA Report, Indigenous Groups identified concerns related to the uncertainties associated with the assumptions made in the assessment presented in the Report by TJLP. Tsleil-Waututh Nation identified a concern with the approach taken in TJLP's BVSA Report, where in Tsleil-Waututh Nation's view TJLP's assessment for changes relies on subjective criteria (e.g., minor changes, no perceptible changes, no detectable changes). Tsleil-Waututh also requested for more clarification on the level of uncertainty and confidence used in the conclusions of TJLP's BVSA Report. Similarly, Snuneymuxw First Nation identified concerns with the approach used by TJLP where the bunker vessel's smaller size was used to counteract effects from increased vessel frequency. Snuneymuxw First Nation also identified concerns that TJLP's BVSA Report used vague terms to approximate the impacts leading to uncertainty and that TJLP's approach of comparing the BVSA results to what was originally assessed in the Application also increased the uncertainty of the conclusions in TJLP's Report.

- TJLP concluded that while there would be more bunker vessels calling at the jetty, the increased number of smaller bunker vessels would not restrict movement in shipping lanes to the same extent as the larger LNG carriers assessed in the Application.

- The EAO also notes that all TMJ-related vessels would be required to conduct operational marine shipping in accordance with the requirements of the *Canada Shipping Act* and other relevant navigation regulations and would be piloted by local pilots as required. TJLP stated that the potential interaction is consistent with what was assessed in the Application and did not conduct further assessment on navigation use and navigability (see Section 8.2 on Land and Marine Resource Use).
- In response to feedback from Indigenous Groups on the BVSA Report, TJLP acknowledged that Appendix B of the BVSA Report did not provide a description of confidence under each VC predicted to be affected by an increase in vessel traffic under the BVS. On the final version of the BVSA Report, TJLP added a description of confidence to the Marine Mammals, GHG, and Human Health VCs.

Indigenous Groups also raised concerns regarding the increased vessels associated with the BVS and potential changes in residual effects for Air Quality and GHGs. Snuneymuxw First Nation identified a concern that TJLP's BVSA Report potentially underestimated effects to Air Quality (and underwater nose) because it did not include proper consideration of a range in vessel types, including older models. Following review of TJLP's BVSA Report, Tsleil-Waututh Nation requested for reassessments for potential effects to Air Quality and GHG emissions under the BVS.

- TJLP noted that the Application was conservative in their Air Quality assessment (i.e., assessed the worst-case scenario), and as such, accounts for the variability in vessel type in their BVSA Report. For example, the model used to predict annual emissions in TJLP's Air Quality assessment assumed that all bunker vessels will be diesel powered articulated tug barges (Tier 2) as these vessels were calculated to have a higher emission rate than LNG-powered vessels.
- The EAO understands that TJLP considers that the assumption that all bunker vessels (100%) would be diesel-powered is unlikely because there is already an LNG-powered bunker vessel under development by an operator based in the Port of Vancouver, which show that the sector is moving toward cleaner, quieter, modern vessels. Also, TJLP expects TMJ would be subject to a condition that would limit the number of LNG vessels calling on the jetty that use crude oil-based fuels (such as diesel) as their primary fuel shall not exceed 13 calls annually, excluding LNG barges driven by tugs because there is no LNG-powered alternative available for these vessel types.
- The EAO proposes Condition 19: Air Quality Management Plan and recommends a KMM under CEAA 2012 for an Air Quality Management Plan, which would include requirements for best management practices to mitigate effects to air quality. The EAO also proposes Condition 20: Greenhouse Gas Reduction Plan, including mitigations designed to reduce GHGs. The EAO is of the view that together, these proposed

mitigation measures would help to reduce adverse effects from TMJ to air quality and GHG management, which includes triggers and corrective actions.

Also, during review of TJLP's BVSA Report, Indigenous Groups including Tsleil-Waututh Nation, Tsawwassen First Nation, and Snuneymuxw First Nation identified concerns related to potential increased risks for spills, or accidents and malfunctions due to the increased frequency of vessel traffic associated with the BVS. The EAO captured these BVSA-related issues in the section on Accidents and Malfunctions (Section 9.3) in Part B of this report.

Concerns regarding cumulative effects assessment in TJLP's BVSA report

During the review of TJLP's BVSA Report, the EAO heard from Indigenous Groups concerns about industrialization of the lower Fraser River, including cumulative effects to the environment and visual quality of the area from increased vessel traffic. Kwantlen First Nation identified concerns with the potential gradual increases to the frequency of vessels under the BVS. Kwantlen First Nation also identified that increased traffic further disenfranchises Kwantlen First Nation from restoring access to fishing in their traditional fishing grounds in the south arm of the lower Fraser River and that a cap should be in place on the number of vessels for the duration of the TMJ project.

- The EAO is recommending a KMM under CEAA 2012 for the Marine Access and Transportation Plan, which specifies that, in each calendar year, the TMJ will receive a maximum of 365 LNG vessel calls, of which a maximum of 68 will be LNG carrier calls.

Tsleil-Waututh Nation identified a concern regarding TJLP's approach to cumulative effects assessment in the BVSA Report, and that the analysis done for the BVSA Report did not adequately address the potential for changes in effects resulting form increased vessel calls under the BVS. Maa-nulth First Nations also requested rationale why cumulative effects assessment were not undertaken for the BVSA by TJLP. The EAO heard from Tsawwassen First Nation concern about under-reporting cumulative effects to noise in the BVSA Report. Snuneymuxw First Nation requested that the potential for effects to Visual Quality under the BVS should be re-assessed and that the approach used in the BVSA Report severely undercuts TMJ's potential effects and TMJ's contribution to cumulative effects on Visual Quality. The EAO understands that Snuneymuxw First Nation is of the view that it cannot place any confidence in the accuracy of this Visual Quality assessment as presented in the BVSA Report.

- The EAO is in agreement with TJLP, that due to the much larger vessel size and escort tug requirement, the LNG Carriers would have potential for greater effect on Visual Quality and Noise compared to bunkering vessels, and that the reduced frequency of LNG carriers combined with the increased frequency of bunkering vessels is not anticipated to result in changes to the assessment for effects on Visual Quality and Noise compared to what was originally assessed in the Application scenario. See the

information found directly above (Section 13.3.1.1) for more details on the EAO's approach to considering changes in residual effects to the Visual Quality and Noise under the BVS in its assessment of potential impacts from TMJ to Aboriginal Interests.

- While the EAO is of the view that the potential impacts on Aboriginal fishing rights have been avoided, minimized, and accommodated to the extent possible for the purposes of the EA, the EAO also recognizes that there are outstanding impacts, in particular cumulative effects, and these outstanding impacts are reflected in the EAO's conclusions, including the EAO's conclusions on the fishing component of Current Use of Resources and Lands for Traditional Purposes (see Section 11.4 of Part B).

Concerns regarding TJLP's proposed synchronization of higher frequency bunker vessel movements with existing traffic during affected FSC fishing openings mitigation measure

The EAO heard feedback from some Indigenous Groups regarding TJLP's proposed mitigation for synchronization of higher frequency bunker vessel movements with existing traffic during affected FSC fishing openings for reducing potential interactions between FSC fisheries harvesters and TMJ-related vessels in the lower Fraser River. Tsawwassen First Nation, Tsleil-Waututh Nation and Snuneymuxw First Nation stated that the proposed synchronization is insufficient in minimizing the effects to Indigenous harvesters. The EAO captured these BVSA-related issues in its assessment on the fishing component of Current Use of Lands and Resources for Traditional Purposes in Part B of this Report (Section 11.4).

- During development of their BVSA Report, TJLP proposed synchronizing project-related bunker vessel movements with existing traffic on the Fraser River during FSC openings to reduce the frequency of interruptions (e.g., the number of times that nets must be moved or retracted and reset) thereby reducing effects to the critical limited FSC fishing openings. The EAO understands that TJLP proposes to make arrangements to work with other users of the Fraser River that would have regularly scheduled vessel transits (e.g., cargo ferries) to coordinate synchronous vessel movements were technically and safely feasible.
- As part of the recommended Marine Access and Transportation Plan KMM, the EAO has recommended additional mitigation measures based on the assessment of TJLP's BVSA Report to help reduce TMJ-related impacts to access for Indigenous Groups that conduct FSC fishing in the lower Fraser River. This KMM would require that, in consultation with Indigenous Groups, TJLP must review annually anticipated locations and timing of FSC fishing activities and develop measures to mitigate the effects of TMJ-related marine shipping on Indigenous traditional use activities from Sand Heads through the Designated Project area, unless not feasible for technical or safety reasons.

- The additional mitigation measures being recommended by the EAO based on the assessment of TJLP's BVSA Report include requirements for TJLP to reduce potential interactions between TMJ-related vessel activity and vessel-based Indigenous fishing activities in the lower Fraser River to Sand Heads during FSC windows by:
    - adjusting the LNG carrier call schedule annually;
    - implementing protocols to adjust LNG carrier arrival and departure times at the marine jetty (while remaining within allotted vessel loading windows);
    - making arrangements to work with other users in the area to synchronize bunker vessel arrivals and departures at the marine jetty with non-TMJ designated marine traffic that has a regularly set schedule; and
    - providing opportunities for safety training for Indigenous Groups related to marine navigation in the marine terminal area.
- The EAO acknowledges that synchronizing bunker vessel traffic with existing traffic does not completely mitigate effects, including impacts on access during FSC openings and other cultural activities. The EAO has also recommended a Cultural Heritage KMM, which would require TJLP to develop nation-specific measures to address the effects on tangible and intangible cultural losses caused by the construction and operation of TMJ, in consultation with those Indigenous Groups experiencing effects (as described in this Report), and to consider developing or contributing to Indigenous-led programs to preserve and enhance cultural heritage.
- While the EAO is of the view that the potential impacts on Aboriginal fishing rights have been avoided, minimized, and accommodated to the extent possible for the purposes of the EA, the EAO also recognizes that there are outstanding impacts, in particular cumulative effects, and these outstanding impacts are reflected in the EAO's conclusions in this Assessment Report.

13.3.2 POTENTIAL IMPACTS ON HUNTING, TRAPPING, AND GATHERING RIGHTS AND CONCERNS RAISED BY INDIGENOUS GROUPS

The EAO's evaluation of potential effects on the right to hunt, trap, and gather considers impacts to biophysical components that may result in changes in harvestable resource quantity and quality, changes in access to hunting, trapping, and gathering sites, and changes to the experience of hunting, trapping, and gathering that are attributable to TMJ.

The potential effects to hunting, trapping, and gathering rights, outlined below, apply broadly to Indigenous Groups; specific issues raised by each Indigenous Group and the EAO's conclusions on project impacts to Aboriginal Interests are discussed in Section 14 for Schedule B

Indigenous Groups, Section 15 for Schedule C Indigenous Groups, and Section 16 for Schedule D Indigenous Groups.

Biophysical Effects:

The EAO understands that an Indigenous Group's hunting, trapping and gathering activities depend, in part, on the status of wildlife and vegetation populations within their area of traditional use. Current conditions at the TMJ site are more suitable to species that are very tolerant of industrial development. The Salish Sea contains foraging areas, nutrient-rich upwellings, tidal mudflats, and nesting habitat for marine birds along the shores. The Salish Sea is an important area to many Indigenous Groups for hunting marine birds as a source of food, and some marine birds hold substantial cultural, social and economic importance.

Musqueam Indian Band, Tsleil-Waututh Nation, and Maa-nulth First Nations raised concerns about potential impacts to terrestrial species of interest. In response to their concerns and those raised by ECCC, TJLP provided supplementary information on the potential effects to barn owl, migratory birds, and little brown myotis bat at the TMJ site. Based on this assessment, TJLP committed to include suitable mitigations to address potential effects from sensory disturbance for these species in their wildlife, noise and light management plans, applicable at the TMJ site. The EAO understands that Maa-nulth First Nations and Esquimalt First Nation agree with the EAO's residual effects assessment but are uncertain about the EAO's significance determination for potential effects to migratory and marine birds from TMJ.

After considering all relevant proposed mitigation measures, the EAO concluded that TMJ would result in loss or alteration of 0.23 ha of marsh and riparian habitat from vegetation clearing and construction of jetty footings in the marsh/mudflat area during construction. TMJ would also result in sensory disturbance from noise and light during all project phases and an increased risk in mortality to wildlife due to due to site clearing, artificial light and vessel strikes. Noise levels are predicted to be highest during construction activities such as during pile driving, but these activities would be temporary in nature. In the MSA area, the EAO predicted residual effects of mortality to marine birds due to collisions with vessels and disorientation from vessel lighting.

Given the negligible to low magnitude of predicted residual effects, the primarily local extent of effects, and the EAO's proposed conditions (Vegetation and Wetland Management and Wetland Offsetting Plan, and wildlife and wildlife habitat management and monitoring, lighting management, and noise and vibration management as part of the CEMP and OEMP which would be developed in consultation with Indigenous Groups), the EAO concludes that the above-mentioned residual effects are not likely to cause significant adverse environmental effects to wildlife and wildlife habitat or marine birds in the region. The EAO is also proposing these mitigations as KMMs under CEAA 2012 which would include the requirements for

migratory birds, lighting, noise and wildlife and wildlife habitat management and monitoring, and a Wetland Compensation Plan. The potential impacts to hunting and trapping rights of each Indigenous Group will be discussed in subsequent sections.

During construction at the TMJ site, site preparation and ground stabilization would result in direct loss of wetland and riparian ecosystems. Species at risk and traditional use plants were not observed within the Project Disturbance Area; however, baseline field surveys cannot determine their complete absence. As part of the proposed condition for the Vegetation and Wetland Management and Wetland Offsetting Plan, pre-construction surveys for rare, culturally significant plants and those protected under SARA would be undertaken. Methods to protect, salvage and transplant those plants and invasive species management would be outlined in the Vegetation and Wetland Management and Wetland Offsetting Plan, which would require consultation with Indigenous Groups. The EAO also proposes KMMs under CEAA 2012 which would include the requirements for a Wetland Compensation Plan. TJLP also expects the wetland and riparian enhancement and restoration to expand the available habitat for these species. Vegetation was not considered in the MSA because it is not expected to be adversely affected by TMJ-related shipping.

After considering the proposed mitigation measures, the EAO concluded that TMJ would result in a potential low magnitude loss of wetland and riparian ecosystems. Considering the proposed mitigation measures and conditions outlined above, the EAO is satisfied that TMJ is not likely to result in significant adverse residual effects to the Vegetation VC. The potential impacts to gathering rights of each Indigenous Group will be discussed in subsequent sections.

Geospatial Components (places, sites, and access):

For TJLP's original Application area, the EAO notes that traditional plant gathering areas were not identified on Tilbury Island and no traditional use plants were observed within the TMJ site. The EAO acknowledges there is a potential for traditional use plants to be present on Tilbury Island in the future, and that some Indigenous Groups have identified traditional harvesting of plants along the banks of the lower Fraser River, including within stream tributaries through the region, which likely included Tilbury Island (i.e., the location of TMJ). Given the current levels of harvestable resources for hunting, trapping, and gathering within the TMJ site, which is situated on fee simple (private) land, the EAO cannot discern a measurable effect of TMJ on access to areas used for hunting, trapping, and gathering by Indigenous Groups beyond the existing cumulative impact of prior development at the site and in the adjacent area.

For the Marine Shipping Assessment area (MSA), the EAO is of the view that TMJ-related shipping may cause infrequent, short-term disruptions to marine-based hunting along the proposed LNG vessel route, negligible effects on Indigenous access to terrestrially based hunting, trapping, and gathering sites that are accessed by boat from the pilot station at Sand

Heads to the 12 nm territorial limit, and no anticipated disruption to access to terrestrial-based activities.

Social, Cultural, Experiential Values

Indigenous Groups noted that terrestrial and marine harvesting is influenced by numerous factors, including the visual condition of the site, noise levels, and confidence in the quality of the harvested animals or plants.

The EAO considers that TMJ is unlikely to materially affect the experience of hunting, trapping, and gathering at the TMJ site because the site provides a very limited existing opportunity for these activities. Where opportunities exist along the shipping route, the relatively small number of TMJ-related vessels compared to current levels of traffic, are predicted to have negligible effects on visual quality and noise in the MSA. Nevertheless, the EAO acknowledges that some Indigenous people may have existing concerns about consuming harvested resources from their territory and that additional development would likely increase those concerns with potential effects to the experience of hunting, trapping, and gathering. The EAO is proposing conditions for a CEMP and an OEMP, which would include lighting and noise management, and Air Quality Management and Greenhouse Gas Reduction Plans to reduce the impacts of visual, noise and air quality impacts at the TMJ site.

Potential impacts on hunting, trapping and gathering under the Bunkering Vessel Scenario:

As described in the section on Wildlife and Wildlife Habitat and Marine Birds in Part B (Section 5.9), the EAO predicts that the residual effect of sensory disturbance on wildlife and wildlife habitat would be continuous for both the Application scenario and BVS. Although the number of TMJ-related vessels transits under the BVS is increased, the EAO concludes in Section 5.9 that despite the potential increased risk of mortality under the BVS compared to the Application scenario, the overall residual effect of mortality would be infrequent for both operating scenarios. Consistent with those conclusions in Part B, the EAO is therefore of the view that there would not be any BVS-related changes to the pathways of effects to impacts to Aboriginal hunting, gather, or trapping rights associated with TJLP's BVSA, compared to what was originally assessed in the Application scenario.

During the review of TJLP's BVSA Report, the EAO heard concerns from Indigenous Groups regarding potential changes in the residual effects to marine birds due to increased frequency of vessel transits under the BVS. Tsawwassen First Nation identified concerns regarding uncertainty for thresholds for avoidance resulting in changes of behaviour or the distribution of marine birds in response to increased vessel traffic under the BVS. Tsawwassen First Nation also identified a concern that changes in the distribution and use of habitats in the lower Fraser River by aquatic birds could potentially affect Tsawwassen First Nation's stewardship values related to aquatic birds in these areas. During the review of the BVSA Report, Snuneymuxw

First Nation identified that in their view, the assessment presented in TJLP's Report lacked established thresholds for effects to aquatic birds due to behavioural disturbances from greater frequency of vessel transits under the BVS.

- In the BVSA Report, TJLP acknowledge that the risk of interaction with aquatic birds is increased under the BVS; however, TJLP does not expect that mortalities to aquatic birds would be more frequent than once a year under the BVS given the infrequency of reported collision-related mortality and the limited aquatic bird abundance in the LAA.

- As described in the section on Marine birds in Part B (Section 5.9), the EAO concludes that during operations TMJ-related vessel activities could result in a negligible to low magnitude effects to marine birds due to sensory disturbances from vessel lighting, and increased risk of mortality. Since the EAO does not anticipate that the BVS would result in any changes to the EAO's Part B conclusions on the residual effects to marine birds from what was originally assessed in the Application scenario, the EAO does not predict any changes to the pathways of effects to impacts to Aboriginal hunting, gathering, or trapping rights in Part C for TMJ. This approach is consistent with the EAO's conclusion in the section on Wildlife and Wildlife Habitat and Marine Birds (Section 5.9).

During the review of TJLP's BVSA Report, Musqueam Indian Band Identified that increased vessel traffic associated with the BVS has potential to impact Musqueam's ability to undertake rights-based activities, including hunting, trapping, and gathering in the area.

- As described in the Part B section on Land and Marine Use (Section 8.2), regularly occurring TMJ-related vessel traffic (average of one vessel call per day) would result in negligible to low magnitude, relatively infrequent and short-duration interruptions to access for marine users from the jetty to Sand Heads. The EAO is of the view that, compared to what was originally assessed in the Application scenario, the increased frequency of bunkering vessels under the BVS would not be expected to result in increased magnitude of effects to access for Aboriginal hunting, gathering, or trapping activities for those Indigenous Groups that access hunting, gathering, or trapping areas through the South Arm of the lower Fraser River.

The potential impact of TMJ on rights to hunt, trap and gather for each Indigenous Group is described in Sections 14 (Schedule B Indigenous Groups), 15 (Schedule C Indigenous Groups), and 16 (Schedule D Indigenous Groups) of this Report.

13.3.3 POTENTIAL IMPACTS ON OTHER TRADITIONAL AND CULTURAL INTERESTS AND CONCERNS RAISED BY INDIGENOUS GROUPS

The EAO's evaluation of potential effects on other traditional and cultural interests considers project impacts that could result in impacts to cultural heritage resources and sites; changes in access and use of cultural sites; and potential impacts to the experience of cultural practices.

The potential effects to other traditional and cultural interests, outlined below, apply broadly to the Indigenous Groups whereas unique issues raised by each Indigenous Group and the EAO's conclusions on project impacts to Aboriginal Interests are discussed in Section 14 for Schedule B Indigenous Groups, Section 15 for Schedule C Indigenous Groups, and Section 16 for Schedule D Indigenous Groups.

Biophysical Components:

TMJ would be located in the Fraser River across from a former Indigenous village site recognized as an important site for the Tsawwassen First Nation in the Tsawwassen Final Agreement, Musqueam Indian Band, Cowichan Nation Alliance, Kwantlen First Nation, and Tsleil-Waututh Nation among others. Cowichan Nation Alliance, Tsawwassen First Nation, Musqueam Indian Band, and Tsleil-Waututh Nation raised concerns about construction activities (including pile driving and dredging) as well as wake and propeller wash effects in the Fraser River during operations that could affect the integrity of heritage sites. Cowichan Nation Alliance stated that archaeological assessments previously completed on the former Indigenous village site indicated ship wake has already degraded the site and has washed away archaeological materials. Cowichan Nation Alliance and Tsleil-Waututh Nation have expressed concerns that TMJ vessels turning directly across from the former Indigenous village site will further the already existing adverse effects on the site.

After considering the proposed mitigation measures outlined in the Heritage Resources section of Part B of this Report (Section 7.1), the EAO found no residual effects to physical heritage or Heritage Resources. TJLP have undertaken limited archaeological studies that did not identify evidence of archaeological resources in the TMJ area. The EAO is satisfied that further archaeological studies undertaken prior to construction at the TMJ site would reduce the uncertainty of unexpectedly encountering historical or archaeological resources in the LAA, and combined with the proposed mitigation measures, would reduce the probability of adverse effects. Heritage resources are protected under the HCA and mitigations for potentially affected sites would be determined in consultation with FLNRORD's Archaeology and Heritage Branch and Indigenous Groups. A Chance Find Management Procedure, included as part of the proposed Cultural and Archaeological Resources Management Plan provincial condition and key recommendation measure under CEAA 2012 developed in consultation with Indigenous

Groups, would outline the process for ensuring the preservation and proper management of heritage resources should any be encountered during TMJ activities. Similarly, the EAO concluded that TMJ would have no residual effects on Heritage Resources from erosion due to wake effects/propeller wash along the shorelines of the Fraser River or in the MSA area.

In the Part B section on Marine Mammals (Section 5.7), the EAO concludes there is an existing significant adverse cumulative effect on SRKWs due to their endangered status under SARA and significant risks to the recovery of this population, and cumulative underwater sound activities from marine shipping that are expected to exceed established underwater sound behavioural disturbance criteria. Considering the residual effects from TMJ in combination with other past, present and reasonably foreseeable projects, the cumulative effects on SRKWs due to underwater noise would be significant.

Concerns about the health and recovery of SRKWs were raised during the EA for both the Original Application Area and the MSA area by several Indigenous Groups. As described in the Marine Mammal section in Part B, the EAO recommends the Marine Mammal Management Plan as well as the Vessel Traffic Management Plan as KMMs under CEAA 2012. The Marine Mammal Management Plan would include identification of the activities that could cause injury or behavioural change to marine mammals, the time periods when elevated marine mammal occupancy is anticipated as well as identification of the TMJ activities that must cease or not start where marine mammals are identified in the area. The Vessel Traffic Management Plan would include identification of how TMJ participating, where possible, in regional environmental management measures to protect SRKWs, such as the federal OPP Whales Initiative. The EAO notes the Government of Canada's commitment to protecting and supporting the recovery of endangered whales, including implementing measures to better understand and manage cumulative effects on the recovery of SRKWs (as described in the Marine Mammals Section 5.7 of Part B).

Geospatial Components (places, sites, and access):

Cowichan Nation Alliance, Kwantlen First Nation, Musqueam Indian Band, and Tsleil-Waututh Nation raised concerns about TMJ effects on access to and use of cultural sites, in particular the former Indigenous village site. The EAO notes that temporary interruptions or changes to Indigenous access to the former Indigenous village site and other known heritage resources along the lower Fraser are possible during operations from TMJ-related vessels transiting in front of the site and to other known heritage sites during transit of TMJ-related vessels through the Salish Sea. To ensure access to cultural and archaeological sites at the TMJ site is not disrupted during construction and operations, the EAO proposes a condition for a Cultural and Archaeological Resources Management Plan which would involve TJLP addressing Indigenous concerns around access, both in terms of ensuring Indigenous access to sites during

construction and prohibiting unauthorized access by the public. The Heritage Resources section of Part B (Section 7.1) provides further details on the Cultural and Archaeological Resources Management Plan.

The EAO understands that the continued use of the Fraser River, including at the TMJ site, for navigation and other cultural and traditional uses is important to Indigenous Groups. The EAO acknowledged that access to the marine terminal area would be disrupted throughout construction and that Indigenous mariners would avoid entering into and remaining in the marine terminal area due to the warning signs and notifications regarding elevated public risk, in particular when vessels would be berthing, loading, or de-berthing at TMJ. The EAO also recognizes that a number of Indigenous Groups use the MSA area for other cultural and traditional purposes, including canoe journeys. The EAO acknowledges that Indigenous Groups' access to the Fraser River and Salish Sea for other cultural and traditional purposes could be periodically disrupted for short duration by transiting TMJ-related vessels during construction and operations. The EAO is not aware of geospatial factors associated with cultural Interests in SRKWs such as preferred locations to see SRKWs or areas where ceremonies or other traditional practices related to SRKWs are held.

Social, Cultural, Experiential Values:

Quw'utsun Nation, Ts'uubaa-asatx Nation, Musqueam Indian Band, Tsleil-Waututh Nation, Kwantlen First Nation, Maa-nulth First Nations and Tsawwassen First Nation raised concerns about the potential TMJ impacts to visual quality, noise, air quality, and water quality on their sense of peace and enjoyment of their territory. Snuneymuxw First Nation identified that the EAO must assess TMJ-related impacts to Aboriginal Interests because of changes in air quality, and atmospheric noise, as these may impact accessibility to preferred harvesting areas representative of Snuneymuxw harvesters or impact the experiences and preferences of harvesters accessing sites, and that noise-sensitive land use receptors should also include receptors representative of Indigenous harvesters around the Project area.

- As described in the Part B chapter on Noise (Section 6.2), the EAO concluded that noise effects would be limited to construction and decommissioning of the marine jetty and are anticipated to be most pronounced during pile driving. As outlined in the EAO's Noise assessment in Part B, TMJ construction activities would be limited to occurring only during the day. Negligible to low magnitude visual quality effects would be possible throughout construction and operations depending on the presence of construction equipment and/or TMJ-related vessels at the TMJ jetty during operations. The EAO proposes several conditions to mitigate these effects, such as the lighting, noise, and vibration management components of the CEMP and OEMP, the Water Quality

Management, Air Quality Management, and Greenhouse Gas Reduction Plans, which must be developed in consultation with Indigenous Groups.

The Application stated that Musqueam Indian Band, Tsawwassen First Nation, Ts'uubaa-asatx Nation, Tsleil-Waututh Nation, Squamish First Nation, Lyackson First Nation, and Kwantlen First Nation raised concerns that development in their territories and throughout the Salish Sea was impeding their cultural continuity and their efforts at revitalizing cultural practices. Proposed conditions to mitigate impacts to cultural continuity include Condition 14 for development of a Cultural and Archaeological Resource Management Plan, and Condition 17: Indigenous Cultural Awareness, Recognition and Mitigation.

Although it was not raised in the TMJ EA, the EAO understands that there are efforts to re-establish a traditional reef net fishing practice in certain parts of the Salish Sea, raising concerns about the impact that transiting ships would have on the future success of such endeavours. The EAO also heard from some Indigenous Groups that the current conditions in the lower Fraser River, and in some areas of the Salish Sea, do not currently support the practice of cultural activities in their preferred manner and that intergenerational knowledge transfer is particularly vulnerable to disturbances from commercial marine shipping activities. Musqueam Indian Band stated that development can lead to rapid changes to sites, which then can make the transfer of knowledge difficult because new knowledge needs to be acquired about the area (e.g., if it was a traditional fishing spot, the Indigenous Group or individual would need to re-learn about how to fish there).

With respect to the marine terminal area, the EAO assumed that Indigenous mariners would avoid entering and remaining in the marine terminal area due to the warning signs regarding elevated public risk, in particular when vessels would be berthing, loading, or de-berthing at TMJ. To avoid or reduce disruptions to marine access and use to the TMJ site, original Application Area and MSA area, the EAO is recommending KMMs under CEAA 2012 for a Marine Access and Transportation Plan from the TMJ site to Sand Heads and a Marine Communication Plan for shipping activities out to 12 nm. The Marine Access and Transportation Plan would include a description of mitigations to reduce disruptions caused by construction and operations for members of Indigenous Groups to carry out traditional use activities that have been identified and communicated by Indigenous Groups to TJLP in relation to this or other relevant plans. The Marine Communication Plan would include procedures to inform Indigenous Groups of traffic schedules, for Indigenous Groups to submit any feedback on potential adverse effects of TMJ-related vessels and for TJLP to document and respond to any feedback received respond in a timely manner.

Many Indigenous Groups raised concerns about potential TMJ effects to SRKWs. The EAO understands there is a strong spiritual and cultural connection to Orca or Killer Whales

(including SRKWs), which Indigenous Groups hold in the highest of esteem. In Part B section on Current Use (Section 11.4), the EAO concluded that TMJ would have significant adverse cumulative effects on intangible cultural heritage, primarily due to cumulative effects to SRKWs, for Indigenous Groups that have a cultural and spiritual connection to SRKWs. The EAO notes that the Government of Canada has stated that it is committed to protecting and supporting the recovery of endangered whales and is implementing measures to better understand and manage cumulative effects on the recovery of SRKWs. The Whales Initiative is underway to support the recovery of SRKWs by addressing imminent threats to SRKWs by improving prey availability and reducing disturbances from underwater vessel noise. The VFPA-led ECHO Program seasonal slowdown initiatives aim to better understand and reduce acoustic impacts of commercial vessels in key foraging areas in SRKWs critical habitat through a range of projects, including implementing and evaluating the effectiveness of both voluntary vessel slow down initiatives and inshore lateral displacement for tugboat operators transiting the Strait of Juan de Fuca. The Government of Canada will continue working with Indigenous Peoples, members of the ECHO Program, the marine industry, and other governments to adaptively manage the recovery of SRKWs.

Potential impacts on other traditional and cultural Aboriginal Interests under the Bunkering Vessel Scenario:

As described in the sections on Noise (Section 6.2) and Marine Mammals in Part B (Section 5.7), the EAO is of the view that compared to what was originally assessed for the Application scenario (in the original Application area), the increased frequency of bunkering vessels under the BVS would not be expected to result in increased magnitude of residual or effects to disturbance / behavioural changes or mortality risks to marine mammals. Consistent with those conclusions in Part B of this Report, the EAO is therefore of the view that there would not be any BVS-related changes to the pathways of effects to impacts to Aboriginal Interests related to the cultural interest in SRKWs associated with TJLP's BVSA, compared to what was originally assessed in the Application scenario.

During the review of TJLP's BVSA Report, Indigenous Groups, including Tsleil-Waututh Nation and Snuneymuxw First Nation identified concerns related to increase frequency of vessel traffic and potential changes to effects to SRKWs. Snuneymuxw First Nation identified a key cultural interest in SRKW and concern about the potential disproportionate increase in bunker vessels, which in Snuneymuxw First Nation's view should require a re-assessment of significance for potential impacts to SRKW. The EAO also understands that Snuneymuxw First Nation is currently in disagreement with TJLP's residual effects conclusions in the BVSA Report, that TMJ-related effects to marine mammals would be 'not significant'. Tsleil-Waututh Nation also identified concerns related to potential increases to the residual and cumulative effects to marine mammals by vessel strikes and underwater noise under the BVS, and disagreement with

TJLP's conclusions that find underwater noise to marine mammals resulting in behavioural disturbances would not be significant.

- The EAO acknowledges that SRKW have important cultural and spiritual value to Coast Salish people, including Snuneymuxw First Nation and Tsleil-Waututh nation. As described in the section of Part B on Marine Mammals (Section 5.7) the EAO concludes that TMJ in combination with other past, present, and reasonably foreseeable projects, may result in significant cumulative effects on SRKW due to underwater noise. Consistent with those conclusions in Part B, the EAO did not identify any changes in potential pathways of effects to other cultural and traditional Aboriginal Interests related to SRKW under the BVS, compared to what as originally Assessed in the Application.

14.0 SCHEDULE B: IMPACTS TO ABORIGINAL INTERESTS BY INDIGENOUS GROUP

14.1 QUW'UTSUN NATION

14.1.1 COMMUNITY PROFILES

The Quw'utsun Nation is comprised of modern-day Hul'qumi'num-speaking Indian Bands of Cowichan Tribes, Halalt First Nation, Lyackson First Nation, Penelakut Tribe, and Stz'uminus First Nation[177]. Quw'utsun Nation was an aboriginal people who existed before, at and after the time of European contact and at 1846.

During the assessment of TMJ, Quw'utsun Nation provided information, in its own words, regarding Quw'utsun Nation's Aboriginal Interests as follows (in *italics*):

> *Quw'utsun Nation holds inherent jurisdiction over the Project area as the controlling indigenous group over that area at all relevant times (pre-contact, at time of contact and through well beyond 1846). Through the illegal colonial dispossession of our lands, the descendant communities of Quw'utsun Nation have been unlawfully denied the ability to exercise that jurisdiction in the Project area; to protect the lands, waters and resources of our territory for the future generations, in accordance with our Indigenous laws. Our inherent governance role in the TMJ Project area, therefore, pre-dates the arrival of Europeans and continues to exist in its entirety despite any assertion of the Crown to the contrary of any action on the part of the Crown or third parties to restrict its exercise.*
>
> *The Quw'utsun Nation exclusively occupied and exploited land at the south shore of Lulu Island on the South (main) Arm of the lower Fraser River known as* Tl'uqtinus*. Our dominant presence at* Tl'uqtinus *permitted us to engage in extensive and year-round activities, as well as in the full suite of other land-based and water-based activities throughout the surrounding areas, such as hunting for sea mammals, bird hunting, and aquatic and*

[177] Technical reviews for EA of TMJ were conducted separately by Cowichan Nation Alliance on behalf of its member Indigenous Groups and Lyackson First Nation, but the EAO has included together in the Quw'utsun Nation Section, at the request of Quw'utsun Nation member Indigenous Groups.

terrestrial plant harvesting in the surrounding territory, which includes the proposed Project footprint.

The historic permanent village site of Tl'uqtinus *is extensively documented in both oral history and European records. To this end, Cowichan Tribes, Stz'uminus First Nation, Penelakut Tribe, and Halalt First Nation (as the Cowichan Nation Alliance) are currently litigating their Title Claim to the village site location, on behalf of the Quw'utsun Nation and with support from Lyackson First Nation. It is the intent of the Quw'utsun Nation to recover Crown-owned* Tl'uqtinus *lands in order to re-establish a permanent residence on the historic village lands and the associated re-establishment of cultural practices and economic participation.*

The marine territory of Quw'utsun nation is extensive. The core marine territory ranges from Gabriola Island to the north and down to the top of the Saanich Peninsula to the south, and then extends to the confluence of the South and North Arms of the Fraser River to the east, encompassing the TMJ Project Area as well as the associated shipping lanes. Of particular relevance to the TMJ Project is the portion of the Core Traditional Territory described as including "the South Arm of the Fraser River, including Canoe Pass, up to and including Douglas Island, with lands on the north shore of the South Arm up to Sapperton Channel (New Westminster), the islands in the South Arm of the Fraser River and the south bank of the Fraser River along Canoe Pass up to Deas Island". Quw'utsun Nation also describes its Traditional Fishing Territory as including the "Fraser River, from Strait of Georgia up Sawmill Creek, north of Yale".

Cowichan Tribes, Halalt First Nation, Lyackson First Nation, and Penelakut Tribe are also members of the Hul'qumi'num Treaty Group. The Hul'qumi'num Treaty Group identify a traditional territory in the Statement of Intent submitted to the BC Treaty Commission, as generally including parts of south-eastern Vancouver Island, the southern Gulf Islands, a portion of the Lower Mainland, and the waters of the Salish Sea to the Sunshine Coast including the lower portion of Howe Sound, Haro Strait, the Strait of Juan de Fuca and the South Arm of the Fraser River up to Yale[178].

Identified by the Hul'qumi'num Treaty Group within that area, is a Core Traditional Territory within which Aboriginal title and the related traditional governance over lands is asserted, and a broader Marine Traditional Territory within which an Aboriginal right to fish and to have jurisdiction in fisheries management based in traditional law are asserted. Of particular relevance to TMJ is the portion of the Core Traditional Territory described as including "the

[178] Hul'qumi'num Treaty Group Statement of Intent. BC Treaty Commission website. http://www.bctreaty.ca/sites/default/files/Hul-qumi-num_Treaty_Group_SOI_Map2.pdf, accessed May 28, 2019.

South Arm of the Fraser River, including Canoe Pass, up to and including Douglas Island, with lands on the north shore of the South Arm up to Sapperton Channel (New Westminster), the islands in the South Arm of the Fraser River and the south bank of the Fraser River along Canoe Pass up to Deas Island". The Hul'qumi'num Treaty Group also describes its Traditional Fishing Territory as including the "Fraser River, from Strait of Georgia up Sawmill Creek, north of Yale" [179].

Locations of importance to Quw'utsun Nation member Indigenous Groups include but are not limited to areas of the South Arm of the Fraser River in the vicinity of TMJ. Quw'utsun Nation reported that the Quw'utsun historic village site at *Tl'uqtinus* spans the north shore opposite Tilbury Island and downstream toward Deas Island. The South Arm. According to Cowichan Nation Alliance's occupation and use study, Cowichan Nation Alliance's traditional name for Tilbury Island is *Xuṕixunum* and Cowichan Nation Alliance First Nations members also refer to Tilbury Island as *shtl'q'uth* or *shtl'q'ath* (on the other side) of the river from *Tl'uqtinus*[180]. *Hwlhits'um* or *Xwulit'sum* is also a location of importance to Cowichan Nation Alliance and is located on Canoe Pass on Westham Island. These areas are considered by Quw'utsun Nation to be ancestral village and resource sites.

In November 2014, the Cowichan Nation Alliance member bands filed an *Notice of Civil Claim* in the British Columbia Supreme Court (BCSC) seeking a declaration of Aboriginal title to an area described as the *Tl'uqtinus* Lands, which include the foreshore and submerged lands and right to fish in the South Arm of the Fraser River[181]. The *Tl'uqtinus* Lands on Lulu Island on the South Arm of the Fraser River are directly across the river from TMJ. The trial commenced in the BCSC in September 2019 and is currently ongoing but close to completion.

On September 14, 2021, the provincial government and Quw'utsun Nation formalized the Cowichan Nation / British Columbia Government to Government Agreement[182]. This agreement is intended to advance reconciliation and commits the parties to work collaboratively on key priorities and support self-determination and self-government.

[179] Hul'qumi'num Treaty Group Statement of Intent. BC Treaty Commission website. http://www.bctreaty.ca/sites/default/files/hul%27qumi%27num%202.pdf, accessed May 28, 2018.
[180] Candace Charlie for Cowichan Tribes, on behalf of the Cowichan Nation Alliance. 2019. STL'ULNUP a Cowichan Nation Use and Occupancy Study for Tilbury Island. Confidential report.
[181] The action was also supported by Lyackson First Nation via Band Council Resolution.
[182] Cowichan Nation British Columbia Government to Government Agreement. September 14, 2021. https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/consulting-with-first-nations/agreements/cowichan_nation_bc_g2g_agreement_may_17_2021_final.pdf

14.1.1.1 COWICHAN TRIBES

Cowichan Tribes is a Central Coast Salish group, a "band" under the *Indian Act*, and a member of the Quw'utsun Nation, Cowichan Nation Alliance and Hul'qumi'num Treaty Group. Cowichan Tribes' main community is in and around Duncan on the east coast of Vancouver Island, about 50 km south of Nanaimo, and a cluster of their nine reserves are located southeast of Duncan. Cowichan IR 1 is adjacent to the City of Duncan, IRs 2, 3, and 9 are in Cowichan Bay, IR 4 is in Cobble Hill, and Cowichan Tribes' IRs 5, 6, 7 and 8 are located west of Duncan. The largest band in BC, Cowichan Tribes' registered population as August 2022 is 5,312.[183]

Cowichan Tribes has engaged directly with TJLP and the EAO on the TMJ EA and collectively as a member of the Cowichan Nation Alliance.

14.1.1.2 HALALT FIRST NATION

Halalt First Nation is a Central Coast Salish group, is a "band" under the *Indian Act*, and is a member of the Quw'utsun Nation, Cowichan Nation Alliance, and Hul'qumi'num Treaty Group. Halalt First Nation's main community is located in Chemainus on southeast Vancouver Island. Of Halalt First Nation's 213 registered members, 81 live on reserve[184].

Halalt First Nation has engaged directly with TJLP and the EAO on TMJ and collectively as a member of the Cowichan Nation Alliance.

14.1.1.3 PENELAKUT TRIBE

Penelakut Tribe is a Central Coast Salish group, a "band" under the *Indian Act*, and a member of the Quw'utsun Nation, Cowichan Nation Alliance, and Hul'qumi'num Treaty Group. Penelakut Tribe is split into four different reserve locations: Penelakut Island, Tent Island, North end of Galiano Island, and Tsussie Road. The Penelakut Tribe is governed by ten elected Councillors, one of whom is Chief Councillor. As of November 2021, Penelakut Tribe has 1,060 registered members with 520 of those members residing on reserve[185].

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[183] Indigenous and Northern Affairs Canada. 2021. First Nation Profiles – Cowichan. https://fnp-ppn.aadnc-aandc.gc.ca/fnp/Main/Search/FNMain.aspx?BAND_NUMBER=642&lang=eng, accessed December 9, 2021.

[184] Indigenous and Northern Affairs Canada. 2021. First Nation Profiles – Halalt. https://fnp-ppn.aadnc-aandc.gc.ca/fnp/Main/Search/FNMain.aspx?BAND_NUMBER=645&lang=eng, accessed December 9, 2021.

[185] Indigenous and Northern Affairs Canada. 2021. First Nation Profiles – Penelakut Tribe. https://fnp-ppn.aadnc-aandc.gc.ca/fnp/Main/Search/FNMain.aspx?BAND_NUMBER=650&lang=eng, accessed December 9, 2021.

Penelakut Tribe has engaged directly with TJLP and the EAO on TMJ and collectively as a member of the Cowichan Nation Alliance.

14.1.1.4 STZ'UMINUS FIRST NATION

Stz'uminus First Nation is a Central Coast Salish group, a "band" under the *Indian Act*, and a member of the Quw'utsun Nation and Cowichan Nation Alliance. Stz'uminus First Nation territory is understood to be represented by the Hul'qumi'num Treaty Group Statement of Intent, although Stz'uminus First Nation is not a member of the Hul'qumi'num Treaty Group. Stz'uminus First Nation's main community is in Ladysmith on southeast Vancouver Island. Of Stz'uminus First Nation's 1,400 registered members, 747 live on reserve[186].

Stz'uminus First Nation has engaged directly with TJLP and the EAO on TMJ and collectively as a member of the Cowichan Nation Alliance.

14.1.1.5 LYACKSON FIRST NATION

Lyackson First Nation is a *Hul'qumi'num*-speaking Coast Salish Nation with a population of over 200 is a member of the Quw'utsun Nation and Hul'qumi'num Treaty Group. Lyackson First Nation has three reserves, all on Valdes Island (*Le'eyqsun*), which lies approximately 47 km west of the TMJ site on the west side of the Strait of Georgia, directly opposite the mouth of the Fraser River. The majority of Lyackson members live off-reserve and in or near Lyackson lands located on the easter shore of Vancouver Island and the adjacent southern Gulf Islands of the Salish Sea. Chemainus, BC serves as the administrative centre for Lyackson, but the eastern Gulf Island Le'eyqsun (Valdes) Island is the cultural homeland of the Nation.

Lyackson First Nation have previously reported that they, along with other Hul'qumi'num speaking groups, traditionally utilized the lands and waters on both sides of the Strait of Georgia as part of a seasonal round. Lyackson First Nation reported that they had a house at the historic Indigenous village site at *Tl'uqtinus* along with each of the other Hul'qumi'num Treaty Group member bands. Lyackson First Nation Elders and knowledge holders have described *Tl'uqtinus* as having been a powerful and permanent *Hul'qumi'num Mustimuhw* trading centre for several commodities. Lyackson First Nation reported that they traveled between *Le'eyqsun* and the mouth and South Arm of the Fraser River year-round for visiting

[186] Indigenous and Northern Affairs Canada. 2021. First Nation Profiles – Stz'uminus First Nation. https://fnp-ppn.aadnc-aandc.gc.ca/fnp/Main/Search/FNRegPopulation.aspx?BAND_NUMBER=641&lang=eng, accessed December 9, 2021.

and resource-harvesting purposes, as well as up and down the Northwest Coast. Lyackson First Nation reported that important economic activity was linked in particular to two Lyackson First Nation villages, *th'hwumqsun* and *T'eet'qe'*[187].

Lyackson First Nation reports that members travelled and fished in the lower Fraser River area well into the 1900s and participated in the commercial fisheries[189]. Lyackson First Nation underscore that their participation in modern fishing efforts was a connection or adaptation of ancestral practice to modern circumstances, and that they never ceded, released, or surrendered their rights on the Fraser River while participating in the evolution of fishing efforts subsequent to contact[187].

14.1.2 QUW'UTSUN NATION INVOLVEMENT IN THE CONSULTATION PROCESS

The EAO is of the view that it has approached consultation with Quw'utsun Nation Indigenous Groups at the deeper level, with the intent to identify potential impacts and consider ways to address potential impacts to any Aboriginal Interests in the project area identified by Quw'utsun Nation. As described in the EAO-led Consultation Activities with Indigenous Groups section of this Report, the EAO invited Quw'utsun Nation member Indigenous Groups to participate in the Working Group.

The EAO set out its approach to consultation, including an initial assessment of strength of claim and potential impacts on Cowichan Nation Alliance's Aboriginal Interests in a letter to Cowichan Nation Alliance representatives, and a letter to Lyackson First Nation dated June 18, 2015. Based on the Province's initial strength of claim assessment, Quw'utsun Nation member Indigenous Groups were consulted at the deeper end of the spectrum as set out in Schedule B of the July 24, 2015 Section 11 Order for TMJ.

The EAO invited Quw'utsun Nation representatives to review and provide comments on the draft Section 11 Order, the draft VC Selection document, the draft AIR, TJLP's Aboriginal Consultation Plan and Reports, the screening of the Application and on the Application and supplemental material, as well as the opportunity to review and comment on several iterations of the EAO's draft decision materials, including the draft provincial TOC, recommended KMMs

[187] Lyackson First Nation. 2017. Lyackson First Nation Traditional Land Use and Mapping Study for the South Coast British Columbia Transportation Authority's Pattullo Bridge Replacement Project, prepared by Ursula Abramczyk with Lyackson First Nation, referenced in MOTI. 2018. Pattullo Bridge Replacement Project EAC Application, Part C Section 12.0 Aboriginal Consultation. https://www.projects.eao.gov.bc.ca/api/public/document/5b7343562400e50024428f13/download/Section%2012.0_Aboriginal%20Consultation.pdf

under CEAA 2012, and the CPD. As part of the EA Working Group, Quw'utsun Nation participated in technical meetings, teleconferences, and a site visit (February 2016) during the Pre-Application and Application Review stages.

During the EA process, the EAO and Quw'utsun Nation discussed concerns related to TMJ and sought to understand, address, and resolve issues. Prior to Application Review, the EAO met in person and by teleconference to provide an update on TMJ and discuss next steps. At the beginning of Application Review, the EAO met directly with Quw'utsun Nation to understand Cowichan Nation Alliance's and Lyackson First Nation's desired approach to consultation on the EA, as well as overall concerns related to the project and Quw'utsun Nation's interests. The EAO and Quw'utsun Nation also discussed collaborative opportunities and developed a joint workplan that identified key meetings throughout the EA process. The EAO provided additional funding to support this work.

The EAO and Quw'utsun Nation had regular teleconferences and meetings during Application Review to follow up on action items, provide updates on the TMJ EA process, discuss and seek solutions to outstanding issues or concerns related to proposed provincial conditions and KMMs recommended under *CEAA 2012*. During the EA, the EAO sought the views of Quw'utsun Nation member Indigenous Groups on whether the potential for adverse effects on the Aboriginal Interests has been avoided, minimized, or otherwise accommodated to an acceptable level, and whether the EAO has fulfilled its obligations for consultation and accommodations relating to the issuance of an EAC for TMJ. The EAO understands that Cowichan Tribes does not agree with the EAO's draft conclusion statement that impacts have been "avoided, minimized or otherwise accommodated" when the actual mitigation measures (which are future 'plans') have not yet been drafted or agreed to by First Nations to be an effective mitigation and requested greater Indigenous oversight to be specified in the draft provincial conditions and KMMs recommended under CEAA 2012.

The EAO met with Quw'utsun Nation member Indigenous Groups and sought to better understand the feedback received on the proposed provincial conditions and KMMs recommended under *CEAA 2012* and the EAO's conclusions for TMJ. Based on the information provided and discussions, the EAO updated the referral materials to reflect the views of Quw'utsun Nation. As outlined in the Section 11 Order for TMJ Quw'utsun Nation Indigenous Groups may also provide a separate submission to the EAO for inclusion into the referral package to decision makers, should Quw'utsun Nation disagree with the EAO's conclusions or the way the EAO has presented Quw'utsun Nation's perspectives in the referral materials.

During meetings, Lyackson First Nation requested greater Indigenous oversight to be specified in the provincial conditions and KMMs recommended under *CEAA 2012*, including being clear in both *what* and *how* the EAO requires certificate holders to engage with Lyackson First Nation.

Lyackson First Nation also view that the proposed conditions for TMJ included language that raises divisiveness among Indigenous Groups and could be clearer about what constitutes a 'material change' with respect to updates to plans.

The EAO appreciates Lyackson First Nation feedback on the draft mitigation measures for TMJ, including requests for more Indigenous oversight to be included in the proposed EAC conditions. The EAO understands that, if the certificate holder does not address all requirements of the EAC with respect to the development of plans, programs, and other document, then the EAO would not accept those plans, programs, and other documents. The EAO is of the view that for those conditions requiring the certificate holder to consult with Lyackson First Nation or other Indigenous Groups, the EAO would confirm that consultation has taken place before undertaking a review of the submitted materials.

In response to feedback on the proposed mitigation measures received during the EA for TMJ, the EAO revised the draft provincial conditions and KMMs recommended under *CEAA 2012*, including requirements for an Indigenous Monitor and a schedule for engagement on plans to be developed in consultation with Indigenous Groups. The EAO acknowledges that the proposed mitigations for TMJ may not completely mitigate all effects and recognizes that there are outstanding impacts, in particular cumulative effects, and these outstanding impacts are reflected in the EAO's conclusions in this Assessment Report. The EAO is of the view that the potential impacts on Quw'utsun Nation's Aboriginal interests have been avoided, minimized, and accommodated to the extent possible for the purposes of the EA, and that the proposed mitigation measures would help to address and reduce the potential residual effects and cumulative effects to VCs and the potential impacts to Quw'utsun First Nation's Aboriginal Interests.

TJLP initiated consultation with the Cowichan Nation Alliance in 2015, before entering the EA process. A summary of TJLP's engagement activities with the Cowichan Nation Alliance members was provided in TJLP's Aboriginal Consultation Reports. TJLP reported that consultation and information-sharing events have included in-person meetings, letters, email exchanges and phone calls.

TJLP began consulting with Lyackson First Nation in early 2014 before entering the EA process, through a letter introducing WMPV and the proposed project. A summary of TJLP's engagement activities with the Lyackson First Nation was provided in TJLP's Aboriginal Consultation Reports. TJLP reports that consultation and information-sharing events have included face-to-face meetings, letters, and email exchanges. During the MSA for TMJ, TJLP provided the EAO, Cowichan Nation Alliance, and Lyackson First Nation with information about

the Marine Safety Protocol that would be in place to manage public safety risk in the marine terminal area.

The EAO is aware that during the review of TJLP's BVSA Report, TJLP met with Lyackson First Nation and Cowichan Nation Alliance to discuss the project and capacity funding agreements for the BVSA and since then TJLP has offered capacity funding and signed agreements with Lyackson First Nation and Stz'uminus First Nation to provide capacity funding to support participation in the review of TJLP's BVSA Report. The EAO is aware that Quw'utsun Nation and TJLP have had negotiations regarding a benefit agreement and that Quw'utsun Nation is of the view it is unlikely that a successful benefit agreement will be concluded between Quw'utsun Nation and TJLP in the future.

At the end of the EA process, Quw'utsun Nation provided a separate submission for TMJ that states Quw'utsun Nation withholds its consent to the project proceeding. The EAO included Quw'utsun Nation's separate submission in the referral package for decision makers at time of referral.

14.1.3 POTENTIAL IMPACTS TO ABORIGINAL INTERESTS

The following sections focus on potential impacts of TMJ to Quw'utsun Nation Indigenous Groups' Aboriginal Interests. A discussion of the EAO's assessment approach is provided in the Impact Assessment Methods section of Part C. The EAO considered information available, including from public sources as well as relevant issues raised by the Quw'utsun Nation during the EA process (in meetings, letters and Working Group comments), in the following assessments of the potential impacts of TMJ on the Quw'utsun Nation's Aboriginal Interests. The following sections focus on the potential impacts of TMJ to fishing; hunting, trapping, and gathering; other cultural and traditional interests; Aboriginal title; mitigations; and accommodations to address potential impacts.

A. POTENTIAL IMPACTS ON FISHING

Quw'utsun Nation identifies salmon as fundamental to the life of Central Coast Salish peoples, both as a resource and spiritually, and that salmon of any species found in the waters of the lower Fraser River region have been, and continue to be, integral to the Quw'utsun[188]. Sockeye

[188] Marshall, D. 2017. Pattullo Bridge Replacement Project, Cowichan Nation Alliance Strength of Claim Report,

and pink salmon, sturgeon, eulachon, and flounder (*P'uwi'*) were predominantly obtained in the lower Fraser River as an integral part of Quw'utsun Nation's traditional economy because they were not available in any abundance in other parts of their traditional territory[188]. Quw'utsun Nation reported that the predictability and abundance of the runs allowed the Quw'utsun to maintain permanent villages, as they could return annually to the same fisheries and depending on the technology, harvest thousands of fish in a day[188]. Quw'utsun Nation's preferred traditional means of fishing included drift netting and set netting along the shoreline water of Tilbury Island, making access to the shoreline of Tilbury Island important to the Quw'utsun[180].

Quw'utsun Nation assert that they have Aboriginal rights to fish within the MSA area LSA and have identified many fishing sites within the Fraser River and Salish Sea as sites for the harvesting of salmon (including coho, chum, jack spring, chinook and sockeye). Cowichan Tribes' current FSC licence allows them to harvest all five species of salmon, herring, herring spawn and all species of groundfish in the PFMA which overlaps with the MSA area LSA and RSA. Cowichan Tribes, Halalt First Nation and Stz'uminus First Nation note that the increase in vessel traffic related to TMJ would pass through their fishing areas.

Lyackson First Nation stated that, within the past few years, it has not been feasible for Lyackson First Nation to fish for food on the lower Fraser River and its foreshore areas[189]. Lyackson First Nation stated that the lack of fishing in the Fraser River is due to reasons outside of their control, such as regulatory constraints, and fish population declines[187]. While members reported going up the Fraser River as far as the Pattullo Bridge for commercial fishing, most recalled fishing largely at the mouth of the Fraser River[189].

Lyackson First Nation reported that they have historically and continue to use the TMJ MSA area including the shipping lanes for fishing and other harvesting activities. Lyackson First Nation reported fishing for salmon in the Salish Sea (specifically the Georgia Strait) relying heavily on their salmon fisheries for their traditions, health, and for economic reasons. Salmon

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Pacific Reach Consulting Ltd., referenced in MOTI. 2018. Pattullo Bridge Replacement Project EAC Application, Part C Section 12.0 Aboriginal Consultation. https://www.projects.eao.gov.bc.ca/api/public/document/5b7343562400e50024428f13/download/Section%2012.0_Aboriginal%20Consultation.pdf.

[189] Lyackson First Nation. 2018. Lyackson review of draft Aboriginal Interests summary for the Pattullo Bridge Replacement Project EAC Application, referenced in MOTI. 2018. Pattullo Bridge Replacement Project EAC Application, Part C Section 12.0 Aboriginal Consultation. https://www.projects.eao.gov.bc.ca/api/public/document/5b7343562400e50024428f13/download/Section%2012.0_Aboriginal%20Consultation.pdf.

forms a critical component of their food supply and they are concerned that the increase in vessel traffic would limit their ability to access salmon for FSC purposes.

The EAO notes the RBT2 Panel report (2020 stated that the Quw'utsun Nation indicated that they used the shipping lanes for fishing and harvesting activities[190]. They informed the RBT2 process that their Aboriginal communal fishing licence overlapped with Segment A of the RBT2 marine shipping area (which is the same as the TMJ MSA segments) and that they had shellfish harvesting locations in segment B, mainly off the coasts of Tumbo and Saturna Islands. Quw'utsun Nation communities expressed concern about existing cumulative activities in the Salish Sea that were impacting their ability to achieve their FSC fish quota due to low levels of fish and having to move from larger vessels when they were out fishing. In the RBT2 Panel report it is noted that Lyackson First Nation members avoided or were unable to travel on the Salish Sea using their preferred mode of transportation, due to the risk of interactions with larger vessels and large wakes. Lyackson First Nation noted that existing marine traffic was preventing Lyackson First Nation from accessing preferred harvesting sites in their traditional territory.

The EAO evaluated the potential effects on fishing rights attributable to TMJ which are summarized in Section 13.3.1. The EAO is satisfied that the key impacts to biophysical components resulting in changes to fish quantity and quality, changes in access to fishing resources, and changes to social, cultural, and spiritual values associated with traditional fishing activities summarized in Section 13.3.1 apply to Quw'utsun Nation. The EAO is also satisfied that with respect to the BVS, any potential changes to relevant pathways of effects on the biophysical, geospatial, and other social, cultural, experiential sub-components of Aboriginal fishing rights summarized in Section 13.3.1.2 apply to Quw'utsun Nation. Additional issues raised by Quw'utsun Nation are outlined below and include a discussion of EAC conditions and recommended key mitigations under CEAA 2012.

Quw'utsun Nation have advised that they are demanding to resume harvesting of traditional food and material resources as formerly on the lower Fraser River, including in the TMJ area, as part of their culturally integral Aboriginal rights[188]. Quw'utsun Nation communities currently fish for FSC purposes outside the Fraser River, however, the timing, frequency, and duration of that fishing, number of fish caught, and participation levels of community boats and members in FSC fishing, was not reported by Quw'utsun Nation. Member communities of the Quw'utsun Nation fish for commercial purposes in the Fraser River under licences held by the Hul'qumi'num Fisheries Limited Partnership. For generations, Quw'utsun Nation have been

[190] The Review Panel for the RBT2 Project. 2020. Federal Review Panel Report for the RBT2 Project. https://iaac-aeic.gc.ca/050/documents/p80054/134506E.pdf.

advocating for reflection of their right to fish in the South Arm of the Fraser River in licensing decisions by DFO, including in the vicinity of TMJ. Quw'utsun Nation has informed the EAO they have recent one-off DFO FSC licences in the Fraser River near Tl'uqtinus. The EAO understands that Quw'utsun Nation has requested the DFO honour and protect the Quw'utsun constitutional right, by, among other things, licensing all five Quw'utsun Nation bands to permanently fish the entire South Arm.

Quw'utsun Nation raised the following concerns regarding potential impacts on the right to fish due to TMJ:

- Concern regarding: the declining trends of sturgeon population in the Fraser River; the importance of the Tilbury Island shoreline as a place were sturgeon gather and a prime fishing spot; potential impacts to spawning habitat as sturgeon have cultural importance to the Quw'utsun Nation; the potential effects of underwater noise on fish; and cumulative effects on fish and fish habitat in the Fraser River.
    - See Section 13.3.1 for a detailed discussion of the analysis and resolution of concerns related to impacts to sturgeon, underwater noise and cumulative effects. The EAO concluded that sturgeon spawning in the Fraser River occurs mainly in large side channel habitats with gravel, cobble and sand substrates and that the habitat at the TMJ site is not known to contain critical habitat features such as spawning habitat for anadromous or resident fish species, including White Sturgeon.
    - As discussed in Section 13.3.1, the proposed mitigation measures to address concerns about sturgeon are included in KMMs under CEAA 2012 recommended by the EAO for a Fish Mitigation to Reduce Harm and Mortality and Fish Habitat Offset Plan, and follow-up programs, including monitoring for sturgeon presence prior to construction and applying additional mitigations if sturgeon is found to be present and undertaking mitigations, as specified by a QP, if works are to be conducted outside of the FLNRORD sturgeon least-risk window. It would also include specific mitigations for underwater noise, including the use of bubble curtains at all times during impact pile driving where feasible and during vibratory pile driving if noise levels exceed thresholds.
- Concern regarding potential impacts to Quw'utsun Nation current and future access to the shoreline of Tilbury Island to practice their traditional means of fishing. Quw'utsun Nation stated that their preferred fishing method includes use of the shoreline and that TMJ, if approved, will block access to one of the last available stretches of Tilbury Island shoreline. Quw'utsun Nation told the EAO that the TMJ infrastructure and the perceived safety concerns associated with the marine terminal area (including boats

turning) would result in an impact that could not be mitigated given that the site is important and cannot be replaced.

  - The EAO is recommending as KMMs under CEAA 2012 for a Marine Communication Plan, a Marine Access and Transportation Plan and a Vessel Traffic Management Plan. These plans would identify the procedures of communication to Indigenous Groups and identification of mitigations to reduce disruptions caused by Construction and Operations for members of Indigenous Groups to carry out traditional use activities including fishing for FSC purposes.
  - While the EAO considers that the proposed mitigation measures for TMJ, such as the Marine Access and Transportation Plan (KMM), have been developed to reduce potential impacts to Indigenous Group's fishing and traditional activities within the vicinity of the TMJ site to the extent possible for the purposes the EA, the EAO also recognizes there is potential for outstanding impacts. To this end the EAO has incorporated information regarding potential impacts to Quw'utsun Nation's current and future access to the shoreline of Tilbury Island to practice their traditional means of fishing into the impact assessment section below.

- Quw'utsun Nation identified that potential access disruptions due to TMJ-related vessel traffic could result in substantial missed fishing opportunities (e.g., a 2-hour DFO opening around *Tl'uqtinus* has to be shut down if it coincides with TMJ-related vessel activities), which will result in loss of food fish for Quw'utsun Nation member Indigenous Groups.
  - As described in Section 13.3.1.1.3 of Part C, the EAO recommends a KMM under CEAA 2012 for a Marine Access and Transportation Plan to help reduce potential interactions between TMJ-related vessel traffic and FSC fishing activities in the lower Fraser River, including requirements for annual review of anticipated locations and timing of FSC fishing activities in consultation with Indigenous Groups that conduct FSC fishing in the lower Fraser River; adjusting the LNG carrier annual call schedule; implementing protocols to adjust LNG carrier arrival and departure times at the marine jetty to the extent possible; and TJLP to make arrangements to work with other users in the area to synchronize bunker vessel arrivals and departures at the marine jetty with non-TMJ designated marine traffic that has a regularly set schedule. The Marine Access and Transportation Plan (KMM) would also require mechanisms for Indigenous Groups to conduct two-way communication with TJLP in real-time about FSC fishing windows to inform TJLP's scheduling and coordination

activities.

- Quw'utsun Nation emphasized that the importance of transmission of culture through harvesting activities would also be interrupted due to TMJ, and that the disruptions to cultural transmission are not only about passing vessels, but the existence of those vessels, which would deter Indigenous people from going to that location to begin with.
    - As described in Section 13.3.1 of Part C, the EAO appreciates that some Indigenous people may find the presence and sounds of TMJ or LNG vessels disturbing and that noise and visual disruptions and concerns about safety could then lead to reduced opportunities for cultural transmission while undertaking traditional harvesting activities. As part of the EAO's recommended Marine Access and Transportation Plan (KMM), TJLP would be required to provide opportunities for safety training for Indigenous Groups related to marine navigation in the marine terminal area.
- Concern regarding the liability on the part of third-party shipping companies in the event of an accident or malfunction which results in damage to Quw'utsun Nation interests, property at *Tl'uqtinus* or fishing gear and consequently impacting their right to fish in the area.
    - The EAO liaised with TC to respond to Quw'utsun Nation's concern.
    - TC confirmed that compensation for damage as the result of collision is sought through a civil claim in the courts. In the event of an accident or malfunction that resulted in damage to fishing gear for example, the liability of the shipowner would depend on the circumstances under which the fishing gear was damaged and therefore whether a vessel is deemed to be at fault (as described in Section 3 of the *Marine Liability Act*). Depending on the circumstances, the other vessel may or may not be liable for damage to fishing equipment.
    - Quw'utsun Nation confirmed that this addressed the question, but the concern that Quw'utsun Nation would have to expend time and financial resources trying to recover from loss caused by a third-party shipping company was not addressed.

Lyackson First Nation raised additional concerns regarding potential impacts on the right to fish due to TMJ:

- Concern regarding potential effects of TMJ on fish habitat and the effectiveness of the proposed mitigation measures. It was noted that room should be made for re-establishing fish in the area.

- See Section 13.3.1 for a detailed discussion of the analysis and resolution of concerns related to impacts to fish and fish habitat. As discussed in Section 13.3.1, the proposed mitigation measures to address concerns about fish and fish habitat are included in the proposed KMMs under *CEAA 2012* for a fish and fish habitat monitoring and mitigation plan and a fish habitat offset plan to offset impacts to fish habitat from TMJ. The fish habitat offset plan, which would be developed in consultation with Indigenous Groups, would identify offsets that are greater and of higher fisheries value (higher productivity) than the habitat that would be directly lost by TMJ. It would also include monitoring program to assess and evaluate the effectiveness of offsetting measures and would require the incorporation of Indigenous traditional knowledge and the effectiveness of the proposed fish habitat offset.

- Concern regarding potential effects on Lyackson First Nation from increased vessel traffic due to TMJ that could impact Lyackson First Nation's use or access of the area in the future. The EAO heard from Lyackson First Nation that marine shipping issues are a concern, including potential impacts on access due to already reduced fishing windows and potential safety concerns of fishers.

  - In the Current Use for Lands and Resources for Traditional Purposes and Cultural Heritage section of Part B (Section 11.4), the EAO concludes that it is reasonable to expect that past and future effects on fish and fish habitat, access to fishing and the experience of fishing would combine with TMJ effects to result in significant cumulative effects for those Indigenous Groups that fish preferentially at the TMJ site. Quw'utsun Nation has informed the EAO that it has conducted FSC fishing in the lower Fraser River near Tl'uqtinus and requested that the DFO, among other things, license all five Quw'utsun Nation bands to permanently fish the entire South Arm. Lyackson First Nation has also communicated that it has a strong interest in fishing regularly in the lower Fraser River in the future and exercises its Aboriginal rights to access fisheries resources through communal licence.

  - The EAO is recommending as KMMs under CEAA 2012 for a Marine Communication Plan and Marine Access and Transportation Plan to identify the procedures of communication to Indigenous Groups and identification of mitigations to reduce disruptions caused by Construction and Operations for members of Indigenous Groups to carry out traditional use activities, including fishing for FSC purposes.

- The EAO heard that Quw'utsun Nation view TJLP's proposed $2 million contribution for non-conventional offset for project-related residual and cumulative effects as narrowly inclusive of a few Indigenous Groups and exclusive to other groups, such as Quw'utsun Nation member bands. Quw'utsun Nation consider that the proposed contribution would not provide opportunities for member bands to contribute to decisions on the activities and suggested that TJLP contribute to a fund that involved all Indigenous Groups in Schedule B for TMJ. Additional information related to TJLP's proposed contribution is provided at the end of Section 13.1 of this report.

The EAO heard that Quw'utsun Nation member Indigenous Groups anticipate fishing in the South Arm of the Fraser River again soon[191], and that Quw'utsun Nation did not agree with the EAO's conclusions about significance of potential impacts to Quw'utsun Nation's Aboriginal Interests. Quw'utsun Nation have advised that they are wanting to resume harvesting of traditional food as formerly on the lower Fraser River; however, Quw'utsun Nation have not yet identified any specific timing related to their future FSC harvesting at the TMJ site, or in the lower Fraser River. Furthermore, Cowichan Tribes told the EAO that blocking access to areas of the shoreline of Tilbury Island, which is a location for one of their preferred means of fishing, has not been accommodated, and that Cowichan Tribes still do not have any sense of security around whether TJLP will actually avoid disrupting their FSC fisheries around the project site.

- The EAO's view is that the KMM recommended under CEAA 2012 for a Marine Access and Transportation Plan requiring the development of measures to mitigate project effects on Quw'utsun Nation member Indigenous Groups' traditional use activities, including DFO-licensed fishing for FSC purposes, would help to address and reduce the potential residual effects due to disruptions from TMJ vessel traffic to FSC fishing by Quw'utsun Nation in the lower Fraser River.
- The EAO acknowledges that the proposed mitigation measures may not completely mitigate effects, including impacts on access during FSC openings (should Quw'utsun engage in these activities in the future) and other cultural activities in the lower Fraser River. The EAO has also recommended a new Cultural Heritage KMM, which would require TJLP to develop nation-specific measures to address the effects on tangible and intangible cultural losses caused by the construction and operation of TMJ, in

[191] The EAO heard from Quw'utsun Nation that fishing has resumed in the South Arm of the Fraser River for FSC purposes as of the week of August 15, 2022.

consultation with those Indigenous Groups experiencing effects, as described in this Report

- While the EAO is of the view that the potential impacts on Quw'utsun's Aboriginal fishing rights have been avoided, minimized, and accommodated to the extent possible for the purposes of the EA, the EAO also recognizes that there are outstanding impacts, in particular regarding cumulative effects, and these outstanding impacts are reflected in the EAO's conclusions in Part B and Part C for TMJ.

14.1.3.1.1 Conclusion

The EAO predicts that TMJ alone would have a **minor-to-moderate** impact to the fishing rights of Quw'utsun Nation. In consideration of the available information, the EAO's consultation with Quw'utsun Nation member communities, Quw'utsun Nation engagement with TJLP, TJLP's commitments, the EAO's proposed EAC conditions if an EAC is issued and the recommended KMMs under *CEAA 2012*, the EAO concludes that TMJ-related effects combined with cumulative effects is expected to result in a moderate impact on the fishing rights of Quw'utsun Nation.

The EAO predicts that TMJ would interact with current baseline levels of cumulative effects that already have a combined negative impact to Quw'utsun Nation's availability of resources, access to fishing areas and the experience of fishing in the South Arm of the Fraser River and to a lesser extent the Salish Sea. These cumulative effects are compounded by the importance of this area of the lower Fraser River to Quw'utsun Nation and the importance of fish harvesting in this area to Quw'utsun Nation's cultural and traditional interests and that TMJ-related vessels would operate in a relatively confined and heavily utilized marine environment, which increase the seriousness of impact of on Quw'utsun Nation's right to fish.

The EAO considered Quw'utsun Nation's perspectives on cumulative effects and Quw'utsun Nation's concern about existing cumulative activities in the Salish Sea that were impacting their ability to achieve their FSC fish quota due to low levels of fish and having to move from larger vessels when they were out fishing. The EAO acknowledges that there are already vessels transiting the lower Fraser River which can impact Indigenous fishers' access to and quality of experience of fishing. While the EAO recognizes there is some uncertainty when considering how cumulative effects impact Aboriginal Interests, the EAO agrees with Quw'utsun Nation, that any increase in vessel traffic at the lower Fraser River would potentially be more serious when combined with past, present and reasonably foreseeable activities.

At the end of the EA process, Quw'utsun Nation provided a separate submission for TMJ that states Quw'utsun Nation withholds its consent to the project proceeding. The EAO included Quw'utsun Nation's separate submission in the referral package for decision makers at time of

referral. The EAO is aware that Quw'utsun Nation and TJLP have had negotiations regarding a benefit agreement and that Quw'utsun Nation is of the view it is unlikely that a successful benefit agreement will be concluded between Quw'utsun Nation and TJLP in the future.

The key factors that were considered in support of the EAO's conclusion on the impacts to the right to fish are summarized as follows:

Biophysical:

- The EAO's conclusions in the Fish and Fish Habitat chapter in Part B that TMJ construction (just over three years in duration) and operations (annual dredging) are likely to result in low magnitude adverse residual effects to fish habitat and potential behavioural responses by fish species at the TMJ site, and low magnitude and frequency impacts to harm and mortality of sturgeon due to potential vessel strikes. No residual effects are predicted to fish and fish habitat in the MSA area; and
- The lower Fraser River is highly industrial and the TMJ site is previously disturbed. The MSA area is a heavily utilized marine environment. These factors increase the seriousness of impact of TMJ on the right to fish.
- Quw'utsun Nation have stated that they had previously fished in the area, but their current use has been constrained and impacted by other past and present activities and projects on the South Arm of the Fraser River as well as within the Salish Sea.

Geospatial (places, sites and access):

- During construction, access to the TMJ site would be restricted for three years. During operations, Indigenous mariners and fishers would avoid entering and remaining in the marine terminal area due to the warning signs and notifications regarding elevated public risk, in particular when vessels would be berthing, loading, or de-berthing at TMJ. At the scale of the LAA and RAA this would amount to a low magnitude impact to access from impacts at the TMJ site;
- The EAO's conclusions in the Current Use chapter in Part B of this Report found that TMJ-related vessel transits would have negligible to low magnitude effect to access to fishing compared to baseline numbers of vessel transits, that could be experienced as higher in the Fraser River as a change from baseline compared to Salish Sea. This effect would be due to the regularly occurring (i.e., an average of one vessel call per day under the BVS) and short-duration vessel movements to pass through known fishing areas in the Fraser River and Salish Sea;
- Quw'utsun Nation is of the view, that due to its unlawful alienation from the Fraser River, the Quw'utsun Nation member communities only fish intermittently around

Tilbury island and seek to resume permanent access to fish in the Fraser River;

- Specific to the BVS there is potential for higher frequency of interactions to occur between TMJ-related vessels and Indigenous Groups engaging in vessel-based FSC fishing in the lower Fraser River during FSC fishing windows. This effect would apply to Quw'utsun Nation should member Indigenous Groups engage in vessel based FSC fishing activities in the lower Fraser River in the future.
- Access by boat and foot is important to the shorelines of Tilbury Island and access to other sites would not be able to replace the loss of access to the proposed jetty location;
- Quw'utsun Nation stated that their preferred fishing method includes use of the shoreline and that TMJ, if approved will block access to one of the last available stretches of Tilbury Island shoreline; and

Social, Cultural and Experiential:

- As outlined in the noise and visual quality assessments in Part B, potential negligible to low magnitude impacts due to a change in noise and visual quality during construction and to changes in visual quality during operations and potential concerns about safety during operations;
- The area around TMJ is important to Quw'utsun Nation as Tl'uqtinus is located across the river from the TMJ site and Quw'utsun Nation is seeking a declaration of Aboriginal title to an area described as the *Tl'uqtinus* Lands, which include the foreshore and submerged lands and right to fish in the area, including Tilbury Island;
- Quw'utsun Nation have told the EAO that the presence of large LNG vessels at Tilbury would have a negative impact to the experience of traditional use in the area; and
- Quw'utsun Nation have noted that the area around TMJ is already experiencing visual and auditory impacts under existing conditions.

Mitigations:

- Proposed mitigations for potential impacts to Quw'utsun Nation member Indigenous Groups' fishing rights, include mitigations to reduce impacts to noise and visual quality in the CEMP and OEMP as well as the recommended KMMs under CEAA 2012, specifically the Fish Mitigations to Reduce Harm and Mortality, Fish Habitat and Offset Plan, Marine Communications Plan, Marine Access and Transportation Plan and Vessel Traffic Management Plan.

B. POTENTIAL IMPACTS ON HUNTING, TRAPPING, AND GATHERING

The Quw'utsun Nation reported that they traditionally harvested animals along the banks of the lower Fraser River main stem and in tributaries through the region, including the TMJ areas during both the pre-contact and historical period[188]. While residing on the lower Fraser River, the Quw'utsun Nation hunted game such as deer, bear, elk, mountain goat and beaver[180]. The areas in the vicinity of TMJ were intensive harvesting sites and were an important resource for the village at *Tl'uqtinus.*

The Quw'utsun Nation reported that they traditionally harvested plants along the banks of the lower Fraser River main stem and in numerous stream tributaries through the region during both the pre-contact and historical period[188], which included Tilbury Island (i.e., the location of TMJ). The Quw'utsun Nation reported that there were plant resources predominantly found in the lower Fraser River that were not available in any abundance in other parts of Cowichan Nation territory but were integral to their traditional economy. In the 2017 Cowichan Nation Alliance Report there is also information about the traditional practice of burning of underbrush as a plant management technique, which is reported to have likely been practiced prescribed burning around the FortisBC upland property on Tilbury Island. In 2013, elders from Stz'uminus First Nation participated in a traditional burning ceremony at *Tl'uqtinus* (noting that the burning ceremony carried out by elders is not related to traditional prescribed burning practices).

Cowichan Nation Alliance reported that Tilbury Island was a Quw'utsun Nation site often used for hunting geese and ducks as well as other species[180]. Quw'utsun Nation reported historically harvesting marine mammals such as harbour porpoise, humpback whale, sea lion, harbour seal and sea otter at confidential locations as well as waterfowl such as ducks and geese in their asserted territory. Quw'utsun Nation identified hunting waterfowl in sites such as the Chemainus River and estuary as well as Porlier Pass, Galiano Island, Tent Island and Shoal Island including Willy Island. Cowichan Nation Alliance member groups reported harvesting marine vegetation, specifically seaweed, in the Strait of Georgia around the Southern Gulf and San Juan Islands.

Lyackson First Nation reported that they historically participated in traditional seal, whale and sea lion hunts in the Salish Sea (Georgia Strait) and enjoyed the exclusive Aboriginal right to harvest seal and sea lions in Porlier Pass. This is a practice Lyackson First Nation is striving to revitalize. Lyackson First Nation also hunted ducks for subsistence at Roberts Bank.

Quw'utsun Nation reported that they do not currently hunt or trap within the TMJ area but they are seeking to re-establish traditional practices there, particularly on the *Tl'uqtinus* lands. Quw'utsun Nation stated that they are demanding to resume harvesting of traditional food and material resources as formerly on the lower Fraser River, including in the TMJ area, as part of their culturally integral Aboriginal rights[188].

The EAO evaluated the potential effects on hunting, trapping, and gathering rights attributable to TMJ which apply broadly to Indigenous Groups. These potential effects are summarized in Section 13.3.2. The EAO is satisfied that the key impacts to biophysical components resulting in changes to wildlife and vegetation quantity and quality, changes in access to hunting, trapping and gathering areas, and changes to social, cultural, and spiritual values associated with traditional hunting, trapping and gathering activities summarized in that section apply to the Quw'utsun Nation. Quw'utsun Nation did not raise specific issues and concerns with potential impacts of TMJ relating to hunting, trapping, and gathering.

14.1.3.1.2 Conclusion

In consideration of the available information, consultation with Quw'utsun Nation, Quw'utsun Nation's engagement with TJLP, TJLP's commitments, the EAO's proposed EAC conditions if an EAC is issued and the recommended KMMs under CEAA 2012, TMJ is expected to result in a negligible impact on Quw'utsun Nation's right to hunt, trap and gather.

At the end of the EA process, Quw'utsun Nation provided a separate submission for TMJ that states Quw'utsun Nation withholds its consent to the project proceeding. The EAO included Quw'utsun Nation's separate submission in the referral package for decision makers at time of referral.

The key factors that were considered in support of the EAO's conclusion on the impacts to the right to hunt, trap and gather are summarized as follows:

Biophysical:

- The EAO's conclusions at the TMJ site on adverse residual effects to Wildlife and Wildlife Habitat and Vegetation (see respective sections in Part B) indicate negligible to low magnitude residual effects on loss or alteration of wildlife habitat, sensory disturbance from noise and light, and mortality; as well as low magnitude residual effects on wetland and riparian ecosystems;
- The EAO's conclusions in the MSA area on adverse residual effects to Marine Birds (see the Wildlife chapter in Part B) indicate negligible to low magnitude residual effects related to mortality; and
- Terrestrial wildlife species of cultural importance to Cowichan Nation Alliance member Indigenous Groups have either not been found within the TMJ site or are not anticipated to be affected by TMJ-related activities.

Geospatial (places, sites and access):

- Quw'utsun Nation do not currently harvest at the TMJ site but seek to re-establish

harvesting practices in the area;

- Quw'utsun Nation have noted that TMJ effects on vegetation and wildlife would be acute for their members due to their strong interest at Tilbury island and its proximity to the village site across the river;
- Construction (just over three years in duration) and operations (30 years) are unlikely to cause disruptions to Quw'utsun Nation access to areas traditionally used for hunting, trapping, and gathering activities at the TMJ site or in the MSA area; and
- The upland portion of the TMJ site is situated on fee simple (private) land.

Social, Cultural and Experiential:

- Potential impacts to experience in the vicinity of the TMJ site and along the shipping route due to a change in noise and visual quality, as described in Part B, during construction and operations which are anticipated to be negligible to low in magnitude in the Fraser River and Salish Sea; and
- Traditional plant management practices involved prescribed burning as described in Cowichan Nation Alliance's 2019 use and occupancy study for Tilbury Island report.
- Quw'utsun Nation has communicated that it has a desire to restore and manage its territory to support a desired future state, including greater access for hunting, trapping, and gathering.

Mitigations:

- Proposed conditions to mitigate impacts to Quw'utsun Nation's right to hunt, trap and gather are the Vegetation and Wetland Management and Offsetting Plan, and wildlife and wildlife habitat management, light management, and noise management components of the CEMP and OEMP, all of which would require consultation with Indigenous Groups. The EAO is also proposing these mitigations as KMMs under CEAA 2012 which would include the requirements for migratory birds, lighting, noise and wildlife and wildlife habitat management and monitoring, and a Wetland Compensation Plan; and
- All vessels would adhere to the Marine Regulations and Legislation regulating vessel noise and lighting.

C. POTENTIAL IMPACTS ON OTHER TRADITIONAL AND CULTURAL INTERESTS

Members of the Quw'utsun Nation identify the Fraser River as both the home of the Quw'utsun Nation permanent village at *Tl'uqtinus*, which is located on the north shore opposite of the TMJ site on Tilbury Island, and the abundant and lucrative salmon resource that was critical to their

social and economic success[188]. *Tl'uqtinus* served as the basis for harvesting of fish and other resources; their trade in camas, clams, and other products for salmon and other resources, including mountain goat wool that Quw'utsun Nation used in ceremonial regalia; and for providing an opportune time for families of high status to meet and arrange marriages, which were economic unions, and to engage in other ceremonial occasions (for example, feasts) that acknowledged and escalated the wealth of these high status families[188]. Lyackson First Nation participants visiting the area as part of the Lyackson Study remarked at the scale of landscape change since they had been last on the river in their youth, 50 to 60 years ago.

The activities of the Quw'utsun Nation while resident at *Tl'uqtinus* ensured that their permanent winter villages on Vancouver Island and the Gulf Islands, and their trans-Georgia Strait culture and traditions, continued to be supported and maintained[188]. *Tl'uqtinus* was most populated during the summer. This was the time for family gatherings, visiting among other villages, celebrations, weddings, naming ceremonies and potlatches[188]. TMJ would be located across the Fraser River from *Tl'uqtinus*.

As described above, the descendants of the Quw'utsun Nation, which include Cowichan Tribes, Halalt First Nation, Lyackson First Nation, Penelakut Tribe and Stz'uminus First Nation, are seeking to reconnect and re-establish their presence within the lower Fraser River. The Quw'utsun Nation identified the Fraser River as important to traditional and cultural interests of the group and have informed the EAO that the re-establishment of the village at *Tl'uqtinus* is of extremely high priority. Quw'utsun Nation informed the EAO that their members use this area as much as possible given the circumstances and that some members currently travel to, fish, and plan cultural events in the area.

- The EAO has proposed Condition 17: Indigenous Cultural Awareness, Recognition and Mitigation to mitigate effects of TMJ on cultural resources and practices in the Marine Terminal Area.
- The EAO also recommends a Cultural Heritage KMM under CEAA 2012, to address the effects on tangible and intangible cultural losses caused by the construction and operation of TMJ, in consultation with those Indigenous Groups experiencing effects, as described in this Report. As part of the measures, TJLP would be required to consider developing or contributing to Indigenous-led programs to preserve and enhance cultural heritage.
    - See Section 13.3.3 for a detailed discussion of the analysis and resolution to concerns regarding cultural interests, including access and use of the *Tl'uqtinus* Lands. As described in that section, the EAO proposes the Marine Communication Plan and the Marine Access and Transportation Plan as part of key mitigations under CEAA 2012, a Water Quality Management Plan condition,

as well as the Lighting Management, Noise Management and Air Quality Management as part of the CEMP and OEMP which would require consultation with Indigenous Groups.

- During Application Review, Quw'utsun Nation provided comments on the Navigational Study and requested more details on the analysis and maps showing the affected areas. Please see the Accidents and Malfunctions Chapter of Part B (Section 9.3) for more details about the variety of memos and technical information that was exchanged over the course of the EA on the topic of navigational safety and societal risk. Cowichan Nation Alliance noted that the capacity funding provided was insufficient to engage the technical expertise to review the additional analysis on societal risk.
- Quw'utsun Nation also identified a concern that, in the event of an accident or malfunction resulting in damages to cultural or heritage resources, a potential burden could be created for them as they would likely have to prove in court the loss of culture and heritage resources which are not normally covered (e.g., compensation would only cover costs associated with loss of income, gear, vessel or property damages).
    - As described in the Accidents and Malfunctions and Effects of the Environment section in Part B of this Report (Section 9), Canada has a liability and compensation regime covering different types of marine risks involving ships, including oil pollution, the release of HNS, collisions, and wreck removal. Refer to the Accidents and Malfunctions chapter (Section 9.3) for more details.
    - The EAO is recommending a Marine Shipping Emergency Response Outreach Program as a KMM under CEAA 2012 to facilitate the integration of plans for responding to incidents in transit into existing emergency response systems, primarily the CCG's Incident Integrated Response Plans.

- Quw'utsun Nation have reported that journeys for their members in the USA have been affected by shipping traffic and are concerned about the safety of their community members undertaking traditional practices on the water.
    - The EAO does not dispute with Quw'utsun Nation that effects have already occurred due to vessel traffic, which has disrupted members from being able to travel to the USA and that there is concern about the safety of members undertaking traditional practices in marine area. As described in the Current Use assessment in Part B, the EAO concluded that that regular TMJ-related vessel transits during operations (30 years minimum) could cause relatively infrequent and short-duration interruptions to access and quality experience.

- The EAO acknowledges that there is uncertainty in the relationship between incremental increases in shipping and the availability of cultural resources; however, as described in the Current Use of Lands and Resources for Traditional Purposes section of Part B, the EAO found it is reasonable to expect that past effects would combine with effects from TMJ-related marine shipping to result in significant cumulative effects to current use for fishing and other cultural use of marine areas for Indigenous Groups whose preferred means of exercising their Aboriginal rights include use of the project area, or who rely on sites located at TMJ or within and adjacent to shipping lanes.
- Marine shipping associated with TMJ would be required to meet the international standards and Canadian regulations set out by Canada's compliance-based marine safety and security system, which is designed to protect life, property, and the marine environment. The EAO is recommending a KMM under CEAA 2012 for a Marine Shipping Emergency Response Outreach Program to facilitate the integration of plans for responding to incidents in transit into existing emergency response systems, primarily the CCG's Incident Integrated Response Plans.
- The EAO is proposing a KMM under CEAA 2012 for a Vessel Traffic Management Plan for the shipping route until 12 nm. The Vessel Traffic Management Plan would include speed limits, where safe, within the Fraser River and MSA area, and commit TMJ-related vessels to following established shipping routes and maintaining a constant course.

- Quw'utsun Nation has identified SRKWs as having cultural importance and are concerned about the potential effects of vessel movements in the Salish Sea may have on this species as well as on ecosystem integrity, cultural values and knowledge transmission.
- Additional issues and concerns with potential impacts related to SRKWs were raised by Quw'utsun Nation member communities during the Roberts Bank Terminal 2 Panel process. Here Quw'utsun Nation members indicated that the cultural importance of SRKWs to Cowichan people cannot be overstated. Lyackson First Nation raised concerns regarding underwater noise related to marine shipping to whales, including SRKW's implications on the food chain and that SRKWs were a part of Lyackson First Nation's origin story. Through the RBT2 process, the Government of Canada heard that Penelakut First Nation was concerned about potential impacts to SRKWs, which have a cultural relevance to Penelakut First Nation related to the concept of 'family'.

The EAO acknowledges that SRKWs are of great cultural and ecological importance to Quw'utsun Nation. See Section 13.3.3 for a detailed discussion of the analysis and resolution of concerns related to the effects on whales. As discussed in that section, the EAO concluded that TMJ would not result in significant residual effects to marine mammals; however, the EAO notes that the current baseline of cumulative effects to SRKWs is already high and that TMJ would contribute additional residual effects from shipping noise and potential avoidance behaviour by SRKWs to ships, such that cumulative effects to SRKW are considered significant.

- The EAO is recommending a KMM under CEAA 2012 for a Vessel Traffic Management Plan that would require TJLP to incorporate contractual measures to support participation of TMJ-related vessels in the VFPA-led ECHO Program seasonal slowdown initiatives (as amended) or a future equivalent and annual reporting on TJLP's participation in regional environmental management measures and cumulative effects monitoring to protect SRKW, where feasible. The seasonal slowdown initiatives currently request vessels to slow down in key SRKW foraging areas such as Swiftsure Banks, Haro Strait and Boundary Pass. The EAO notes several regional initiatives and measures have been implemented by the Government of Canada to better understand and manage cumulative effects on the recovery of SRKW (listed in Section 13.1.1).

Lyackson First Nation identified five "interactions" values, consisting of three sites of "family relations" and two sites of "trade." The two sites of trade are described as intersecting the TUS Area while the three family relations sites are said to be dispersed up and down the Fraser River[187]. Lyackson First Nation provided maps that depict this "interactions" area as the entire stretch of the Fraser River from its mouth to upstream of Barnston Island, an area that overlaps the Project Boundary. Lyackson First Nation also identified locations considerably downstream of the TMJ site with important values. Three "small-craft transportation" values are identified as fishing routes to the Fraser River across the Salish Sea from *Le'eyqsun*. One "story-history" value is identified as taking in the lower portion of the South Arm, from *Tl'uqtinus* down to the Salish Sea. Two "habitation" values are also identified, corresponding to the Deas Island and Steveston areas.

Lyackson First Nation identified foreshore and intertidal areas as of critical importance to subsistence and knowledge transmission. Lyackson First Nation reported Tumbo Island reef areas as of particular importance as a fishing area and as a refuge area in bad weather. Areas of archaeological potential along the waterfront were identified as important and reported concern that erosion related to the increase in vessel traffic would affect these sites.

Lyackson First Nation identified potential impact on archaeological and heritage resources as being a key concern and highlighted the importance of cultural continuity to Lyackson First Nation. Lyackson First Nation would like to see enhanced public awareness of the

Fraser River as a shared First Nations place that is important to Central Coast Salish communities.

Lyackson First Nation also identified an opportunity to increase public awareness of First Nations history and connections to the Fraser River generally through development of interpretive information, which could include a narrative of the Fraser River.
Lyackson First Nation reported SRKWs as important to their culture. Killer whales are depicted in visual art, stories, and songs.

14.1.3.1.3 Conclusion

The EAO predicts the TMJ-related marine shipping effects alone would have **minor** impacts on Quw'utsun Nation's other cultural and traditional interests, although the EAO acknowledges that there is uncertainty in the relationship between incremental increases in shipping and the availability of cultural resources, such as SRKW. However, in consideration of the available information, the EAO's consultation with Quw'utsun Nation, Quw'utsun Nation's engagement with TJLP, TJLP's commitments and the EAO's proposed EAC conditions if an EAC is issued, TMJ, combined with existing conditions, is expected to result in a **moderate-to-serious impact** on Quw'utsun Nation's other traditional and cultural interests. The EAO's conclusions of significant cumulative effects to SRKW was a major key factor considered in the EAO's seriousness determination. The EAO notes several regional initiatives and measures have been implemented by the Government of Canada to better understand and manage cumulative effects on the recovery of SRKW (listed in Section 2.13.1).

At the end of the EA process, Quw'utsun Nation provided a separate submission for TMJ that states Quw'utsun Nation withholds its consent to the project proceeding. The EAO included Quw'utsun Nation's separate submission in the referral package for decision makers at time of referral. The EAO is aware that Quw'utsun Nation and TJLP have had negotiations regarding a benefit agreement and that Quw'utsun Nation is of the view it is unlikely that a successful benefit agreement will be concluded between Quw'utsun Nation and TJLP in the future.

The key factors that were considered in support of the EAO's conclusion on the impacts to other traditional and cultural interests are summarized as follows:

Cultural and Heritage Resources:

- The EAO's conclusions in the Heritage Resources section of Part B did not predict residual effects to Heritage Resources (Section 7.1) from erosion due to wake effects along the shorelines of the Fraser River in the RAA or in the MSA area;
- The EAO's conclusions in Part B section on Marine Mammals, which found low to moderate magnitude residual effects from TMJ-related vessels on SRKWs and significant

cumulative effects to SRKW due to underwater noise; and

- The lower Fraser River is highly industrial and the TMJ site is previously disturbed. The MSA area is a heavily utilized marine environment. These factors increase the seriousness of impact of TMJ.

Geospatial (places, sites, and access):

- Construction and operation are unlikely to cause disruptions to Quw'utsun Nation members' access to cultural sites, such as the village site at *Tl'uqtinus*, and uses identified by Quw'utsun Nation in the Fraser River area. The EAO understands that Quw'utsun Nation disagrees with the EAO's conclusions regarding potential effects to access to the village site at *Tl'uqtinus.*
- During construction, access to the TMJ site would be restricted for three years. During operations, Indigenous mariners and fishers would avoid entering and remaining in the marine terminal area due to the warning signs and notifications regarding elevated public risk, in particular when vessels would be berthing, loading, or de-berthing at TMJ;
- The small number of TMJ-related vessels relative to current vessel traffic are predicted to have a negligible to low effect on cultural activities in the MSA area in terms of access from regularly occurring (i.e., an average of one vessel call per day under the BVS) vessel transits to and from TMJ's marine terminal area could cause relatively infrequent and short-duration interruptions to access and quality of experience; and
- Quw'utsun Nation member communities' future desire to use *Tl'uqtinus* Lands across from the TMJ site for other cultural and traditional purposes. For example, Stz'uminus First Nation elders held a burning ceremony at the village site at *Tl'uqtinus* and would like to hold regular ceremonies there in the future.

Social, Cultural, Experiential:

- The EAO's conclusions in the Noise assessment in Part B found sensory disturbances from noise are anticipated to be negligible to low magnitude, temporary and short-term, including up to low magnitude during construction and decommissioning at the village site at *Tl'uqtinus.*
- The EAO's conclusions in the Visual Quality chapter in Part B found a negligible to low impact to the existing visual landscape character in the Fraser River, and for the village site at *Tl'uqtinus* daytime viewing impacts would be negligible to low, and nighttime viewing impacts would be negligible with the implementation of the proposed mitigation measures. The EAO understands that Quw'utsun Nation disagrees with this conclusion and considers that the visual quality impacts to the village site will be higher. The EAO understands that the level of visual impact may increase, when the permanent

residences that Quw'utsun Nation intends to re-establish at *Tl'uqtinus* are located at Viewpoint 2 in the future, due to potential increased visual exposure to the Project compared to current users.

- Quw'utsun Nation emphasized that its traditional Hul'qumi'num language is threatened, such that the significance of any disruptions to language culture is considered high.
- Quw'utsun Nation have told the EAO that the presence of large LNG vessels at Tilbury would negatively impact the experience of traditional use in the area, including potential concerns regarding safety during operations in the Fraser River and Salish Sea.
- Quw'utsun Nation have noted that the area around TMJ is already experiencing visual and auditory impacts under existing conditions.
- Quw'utsun Nation's cultural and spiritual interest in SRKW.

Mitigations:

- Proposed provincial conditions to mitigate impacts to cultural heritage are the development of the Cultural and Archaeological Resources Management Plan for the TMJ site, the Lighting Management, Noise and Vibration Management and Air Quality Management as part of the CEMP and OEMP as well as the Water Quality Management Plan and the Indigenous Cultural Awareness and Recognition Condition.
- *Heritage Conservation Act*, (RSBC 1996, c. 182).
- Proposed mitigations for potential impacts to traditional and cultural interests are the recommended KMMs under CEAA 2012 for a Marine Communications, and Vessel Traffic Management Plans, and a Marine Shipping Emergency Response Outreach Program.

The EAO understands that Quw'utsun Nation does not agree with the EAO that impacts have been "avoided, minimized or otherwise accommodated", Quw'utsun Nation is of the view that the assessment under-represented the potential for visual impacts and access to the village site at *Tl'uqtinus* with respect to Quw'utsun Nation's plans for the area (i.e., residential use), and that Quw'utsun Nation did not agree with the conclusions in the Application or the EAO's conclusions about significance of potential impacts to Quw'utsun Nation's Aboriginal Interests.

- The EAO is of the view that the proposed mitigation measures for TMJ would help to address and reduce potential impacts to Quw'utsun Nation's other traditional and cultural interests. Proposed EAC conditions requiring Construction and Operational Environmental Management Plans, including measures to specifically address noise and lighting management and specify how Indigenous use information has been

incorporated into the plans, would help to reduce potential impacts to visual quality and noise to the village site at *Tl'uqtinus*.

- Also, the EAO considers that the recommended KMM under CEAA 2012 for a Marine Access and Transportation Plan, would include a requirement to identify procedures for safety training for Indigenous Groups, which could help reduce potential impacts related to safety concerns if training is completed by Quw'utsun Nation members should TMJ be allowed to proceed. The EAO also recommends a Cultural Heritage KMM under CEAA 2012 to address the effects on tangible and intangible cultural losses caused by the construction and operation of TMJ. The EAO is of the view that the potential adverse effects on Quw'utsun Nation's other cultural and traditional interests have been avoided, minimized and accommodated to the extent possible but the EAO also recognizes that there are outstanding impacts, in particular regarding cumulative effects, and these outstanding impacts are reflected in the EAO's conclusions in Part B and Part C for TMJ.

D. POTENTIAL IMPACTS ON TITLE

The assessment of impacts to Aboriginal title was informed by the relevant information presented above and below. It is also informed by the EAO's assessment of effects to VCs that informed the discussion of impacts to vegetation, wildlife, fishing, hunting, trapping and gathering, and other traditional and cultural interests.

Quw'utsun Nation raised the following concerns regarding potential impacts on Aboriginal title due to TMJ:

- Inadequate consideration of the impacts to Quw'utsun Nation's right to obtain economic benefit from the land, or to manage and make decisions about how those lands are used. Cowichan Nation Alliance's Declaration for Reconciliation[192] specifies that land and resource use objectives will be consistent with the recovery, restoration, re-establishment of permanent residences and river access, re-establishment of culturally integral practices, and realization of compatible revenue, economic and employment opportunities and benefit related to the village and surrounding lands at

[192] A Cowichan Nation Alliance Declaration for Reconciliation was endorsed by Cowichan Tribes, Stz'uminus First Nation, Penelakut Tribe, and Halalt First Nation in 2016, asserting that together descendants of historic Quw'utsun Nation are pursuing overdue reconciliation of Crown Sovereignty with Quw'utsun Nation Aboriginal rights, including title, on the south arm (i.e., main channel) of the Fraser River (including the mouth), including village lands and surrounding areas of *Tl'uqtinus*.

Tl'uqtinus and South Arm of the Fraser River and mouth. Lyackson First Nation supports these objectives.

  - The EAO notes that TMJ would be located on fee simple private land that were used for industrial purposes.

- Concern regarding impact from the large ships maneuvering and docking directly across from the Quw'utsun Nation's village lands, interfering with use and enjoyment of these lands.
  - In the Current Use of Lands and Resources for Traditional Purposes and Cultural Heritage in Part B, the EAO concluded negligible to low magnitude adverse residual effects due to TMJ-related vessel traffic, would include interruptions in access to marine use areas, changes in noise and visual quality, and affects to both safety and perception of safety due to TMJ-related vessel traffic during operations (30 years in duration).
- Concern regarding the assessment of adverse impacts to Aboriginal title with respect to usage of title lands and adjacent fisheries; and potential conflicts between the TMJ jetty construction and operations with the Quw'utsun Nation's goal of developing a dock or marina at *Tl'uqtinus* or having permanent residence there.
  - The EAO concludes in Current Use of Lands for Traditional Purposes in Part B that regularly occurring vessel transits (i.e., an average of one vessel calls per day under the BVS) could cause negligible to low magnitude effects to access due to short-duration vessel movements to pass through known fishing areas in the Fraser River and Salish Sea.
  - During operations the EAO assumed that Indigenous mariners and fishers would avoid entering and remaining in the marine terminal area due to the warning signs and notifications regarding elevated public risk, in particular when vessels would be berthing, loading, or de-berthing at TMJ.
  - In the Noise assessment in Part B of this Report, the EAO concluded negligible to low magnitude and short-term noise effects in the LAA near the TMJ site, including at the First Nations village of *Tl'uqtinus*, during construction and decommissioning of TMJ.
  - In the Current Use of Lands and Resources for Traditional Purposes and Cultural Heritage assessment in Part B, potential negligible to low magnitude impacts to the experiential aspects of site use in the vicinity of the TMJ site due to a change in noise and visual quality during construction and to changes in visual quality and potential concerns regarding safety during operations.

- The EAO is of the view that the proposed provincial conditions requiring Construction and Operational Environmental Management Plans, including measures to specifically address noise and lighting management and specify how Indigenous use information has been incorporated into the plans, would help to reduce potential impacts to visual quality and noise to the village site at *Tl'uqtinus*.

Quw'utsun Nation raised concerns regarding the EAO's analysis that access would not be limited if the TMJ were to be approved because these lands are private. Quw'utsun Nation states that they assert Aboriginal title to Tilbury Island and incidental to these rights is the ability to access, manage and obtain the benefit of those lands.

- The EAO understands that Quw'utsun Nation is of the view that due to its unlawful historical exclusion from the area, the combined cumulative impacts should be weighed in the assessment for potential impacts due to future exclusion from the foreshore area. Quw'utsun Nation is in active litigation and seeking a declaration of Aboriginal title to an area described as the *Tl'uqtinus* Lands[193] and rights to fish in the South Arm of the Fraser River.
    - As private lands were specifically excluded by the Tsilhqot'in Nation in Tsilhqot'in Nation v. BC, 2014 SCC 44, the relationship between Aboriginal title and private property has not been resolved to date, so the EAO will be guided by future developments in the common law in this area.
- For the purposes of consultation and assessing the potential impacts of the proposed TMJ project, the current limitations on access to the fenced upland portions of the project site is a relevant factor.

The Application stated that Lyackson First Nation raised the following concerns regarding the potential impact TMJ would have on *Tl'uqtinus*, which is located across from the TMJ site.

- See Section 13.3.3 for a detailed discussion of the analysis and resolution to concerns regarding access and use of the *Tl'uqtinus* Lands. Proposed provincial conditions to mitigate impacts to cultural heritage are the development of the Cultural and Archaeological Resources Management Plan for the TMJ site, the Lighting Management, Noise and Vibration Management and Air Quality Management as part of the CEMP and OEMP as well as the Water Quality Management Plan and the

[193] The *Tl'uqtinus* Lands on Lulu Island on the South Arm of the Fraser River are directly across the river from the proposed TMJ site.

Indigenous Cultural Awareness and Recognition Condition, and the recommended KMMs under CEAA 2012 for the Marine Access and Transportation and Marine Communications Plans.

- The Marine Access and Transportation Plan would include a description of mitigations to reduce disruptions caused by construction and operations for Indigenous Groups to carry out traditional use activities. The Vessel Traffic Management Plan would include speed limits, where safe, within the Fraser River and MSA area, and commit TMJ-related vessels to following established shipping routes and maintaining a constant course.

Quw'utsun Nation raised concerns regarding the potential negative impacts to the Quw'utsun Nation member communities' use and enjoyment of the *Tl'uqtinus* Lands and their territory, including their desired and intended future use of the area, including an outstanding issue with how TJLP assessed for visual impacts at the village site at *Tl'uqtinus*. Quw'utsun Nation expressed that TJLP refused to assess for visual impacts to the village site at *Tl'uqtinus* in a way that is meaningful to Quw'utsun Nation because its members will establish residential use of the area future. The EAO understands that Quw'utsun Nation disagrees with the EAO's conclusions regarding potential effects to access to the village site at *Tl'uqtinus* for Quw'utsun Nation current use of lands and resources and traditional purposes and cultural heritage.

- Quw'utsun Nation noted that they also plan in the future to construct and operate a dock or small marina on the north bank of the river channel and worry that turning ships in the channel may impact their ability to carry out these plans (such as erosion of the north bank due to wake effects), and that effects such as light and noise would potentially interfere with the enjoyment of activities at *Tl'uqtinus*. Quw'utsun Nation told the EAO that the village at *Tl'uqtinus* would be particularly affected by visual and auditory disruptions due to its close proximity to the TMJ site and that existing baseline cumulative impacts on the visual and auditory context should not "count against" the assessment of any additional disruption directly from TMJ.
    - In the EAO's assessment of Current Use of Land and Resources for Traditional Purposes in Part B, the EAO concluded potential for negligible to low magnitude adverse residual effects from interruptions in access to heritage due to TMJ-related shipping during operation (30 years in duration).
    - In the Noise assessment in Part B, the EAO concluded potential for low magnitude and short-term noise effects in the LAA near the TMJ site, including at Quw'utsun Nation village of *Tl'uqtinus,* during construction and decommissioning of TMJ.

- TJLP completed a visual quality assessment at the historic Indigenous village site at *Tl'uqtinus* along Dyke Road as a key viewpoint and nighttime viewing location for TMJ ("Viewpoint 2") in its original Application. TJLP's visual quality assessment was consistent with best practices for visual impact assessment as described in the AIR for TMJ, which was based on the current viewing conditions at the site and reasonably foreseeable development in the study area.
- In the Visual Quality assessment in Part B, the EAO concluded that at *Tl'uqtinus* the daytime viewing impacts would be negligible to low, and nighttime viewing impacts would be negligible with the implementation of the proposed mitigation measures for operations. TJLP identified that it would be expected that the level of visual impact may increase if permanent residences (e.g., the residences that the Quw'utsun Nation intends to establish at that exact location) were located at Viewpoint 2 as they would have increased visual exposure to the Project than current users.
- The EAO is recommending a KMM under CEAA 2012 which states that where lighting is not standardized based on navigational and safety requirements, strategies to minimize glare such as direction, timing and intensity would be employed by TJLP. To reduce impacts related to noise and visual quality, the EAO has proposed the Lighting Management, Noise Management and Air Quality Management as part of the CEMP and OEMP which would require consultation with Indigenous Groups.

14.1.3.1.4 Conclusion

In consideration of the available information, the EAO's consultation with Quw'utsun Nation, Quw'utsun Nation's engagement with TJLP, TJLP's commitments and the EAO's proposed EAC conditions if an EAC is issued, and recommended KMMs under CEAA 2012 TMJ is expected to result in a **minor** impact on Quw'utsun Nation's Aboriginal title.

Quw'utsun Nation disagreed with the EAO's assessment that the impacts to Quw'utsun Nation's title would be minor. Quw'utsun Nation considers that TMJ is a major project located on asserted Quw'utsun Nation Aboriginal title lands and directly across the river from an important Quw'utsun Nation village site. Quw'utsun Nation told the EAO that the approval of TMJ would adversely impact Quw'utsun Nation's ability to use, manage, and benefit from those lands for many decades. At the end of the EA process, Quw'utsun Nation provided a separate submission for TMJ that states Quw'utsun Nation withholds its consent to the project proceeding. The EAO included Quw'utsun Nation's separate submission in the referral package for decision makers at time of referral. The EAO is aware that Quw'utsun Nation and TJLP have had negotiations regarding a benefit agreement and that Quw'utsun Nation is of the view it is

unlikely that a successful benefit agreement will be concluded between Quw'utsun Nation and TJLP in the future.

The key factors that were considered in support of the EAO's conclusion on the impacts to Aboriginal title are summarized as follows:

Use and Occupation:

- The access restrictions to the area surrounding the jetty during construction would be limited in area (to a maximum of area of 23 ha during dredging over 50 days; and then a smaller area for work on the jetty thereafter);
- The EAO assumed that Indigenous mariners and fishers would avoid entering and remaining in the marine terminal area due to the warning signs and notifications regarding elevated public risk, in particular when vessels would be berthing, loading, or de-berthing at TMJ. The increase in vessel traffic along the Fraser River would be a small percentage increase from traffic already present; and
- As outlined in the noise and visual quality assessments in Part B, the EAO predicts TMJ would have the potential for short-term duration, negligible to low magnitude residual effects to the Noise and Visual Quality VCs during construction, and frequent (vessel-related) and continuous (jetty site-related) negligible to low effects on visual quality during operations. With respect to the low magnitude noise effects at the village site at *Tl'uqtinus,* the EAO anticipates those would be short-term in duration.
- Cowichan Nation Alliance Declaration for Reconciliation[192], endorsed by Cowichan Tribes, Stz'uminus First Nation, Penelakut Tribe, and Halalt First Nation, specifies land and resource objectives related to recovery, restoration, re-establishment of permanent residents and river access, and re-establishment of culturally integral practices related to the village and surrounding lands at *Tl'uqtinus* and South Arm of the Fraser River and mouth. Lyackson First Nation supports these objectives.

Control of Area:

- The area of development for the TMJ is crown land (submerged);
- Quw'utsun Nation asserts the right to manage and make decisions about how lands are used as an aspect of their Aboriginal title and have identified an expectation for opportunities to participate in and inform management and planning for the TMJ site and lower Fraser River generally;
- The EAO acknowledges the ongoing litigation in the British Columbia Supreme Court in *Cowichan Tribes v. Canada (Attorney General),* regarding Quw'utsun Nation assertions of Aboriginal rights and title to *Tl'uqtinus* and the South Arm of the Fraser River;

- The upland portion of TMJ is located on fee simple private land that are used for industrial purposes; and

Economic Benefits:

- The construction and operation of the TMJ jetty and the vessel traffic to and from TMJ in the Fraser River is unlikely to affect Quw'utsun Nation's economic development aspirations for *Tl'uqtinus* Lands and the adjacent area now and in the future;
- TMJ is located on private land already zoned and developed for industrial usage; and
- The construction and operation of the TMJ jetty and the vessel traffic to and from TMJ in the Fraser River may have minor economic impacts Quw'utsun Nation's harvesting of fish.
- Cowichan Nation Alliance Declaration for Reconciliation[192] recognizes and affirms land and resource objectives related to the realization of compatible revenue, economic and employment opportunities and benefit related to the village and surrounding lands at *Tl'uqtinus* and South Arm of the Fraser River and mouth. Lyackson First Nation supports these objectives.

Mitigations:

- Several conditions are proposed to mitigate impacts to Aboriginal title, including a Cultural and Archaeological Resource Management Plan, Indigenous Monitors, Engagement and Reporting, and an Indigenous Training, Employment and Procurement Plan. The EAO is also recommending a Marine Access and Transportation Plan and Marine Communication Plan as KMMs under CEAA 2012 to reduce impacts to access from construction and operations.

14.2 TS'UUBAA-ASATX NATION (LAKE COWICHAN)

14.2.1 COMMUNITY PROFILE

Ts'uubaa-asatx Nation (formerly Lake Cowichan First Nation) is a Hul'qumi'num-speaking Central Coast Salish group. Ts'uubaa-asatx Nation's membership takes descent from Ditidaht ancestors and *Hul'qumi'num'* ancestors known as the Somenos (or Saumni, Samena, Saumina, and other variations). Their community is based on a single reserve on the northeastern shore of Cowichan Lake, approximately 30 km west of Duncan (on the east coast of Vancouver Island), and less than 20 km east of Nitinat Lake (on the west coast of Vancouver Island). In 1860, the community was significantly affected by a smallpox epidemic. As of November 2021,

Ts'uubaa-asatx Nation has 26 registered members, 14 of which live on Ts'uubaa-asatx Nation reserve lands.[194]

Ts'uubaa-asatx Nation is part of the Hul'qumi'num Treaty Group, which also includes Cowichan Tribes, Halalt First Nation, Penelakut Tribe, Stz'uminus First Nation, and Lyackson First Nation. The Hul'qumi'num Treaty Group identify a traditional territory in the Statement of Intent submitted to the BC Treaty Commission, as generally including parts of south-eastern Vancouver Island, the southern Gulf Islands, a portion of the Lower Mainland, and the waters of the Salish Sea to the Sunshine Coast including the lower portion of Howe Sound, Haro Strait, the Strait of Juan de Fuca and the South Arm of the Fraser River up to Yale [195]. As identified by the Hul'qumi'num Treaty Group, within that area there is a Core Traditional Territory within which Aboriginal title and the related traditional governance over Hul'qumi'num lands is asserted, and a broader Marine Traditional Territory within which an Aboriginal right to fish and to have jurisdiction in fisheries management based in traditional law are asserted.

The Hul'qumi'num Treaty Group describes its Traditional Fishing Territory as including the "Fraser River, from Strait of Georgia up Sawmill Creek, north of Yale"[196]. Also, the Hul'qumi'num Treaty Group assert its Core Traditional Territory being described as including "the South Arm of the Fraser River, including Canoe Pass, up to and including Douglas Island, with lands on the north shore of the South Arm up to Sapperton Channel (New Westminster), the islands in the South Arm of the Fraser River and the south bank of the Fraser River along Canoe Pass up to Deas Island". Ts'uubaa-asatx Nation indicated that, in addition to the Hul'qumi'num Treaty Group's definition, the core territory also includes areas on the south bank of the Fraser River from Deas Island to Douglas Island, including surrounding islands.

Ts'uubaa-asatx Nation traditionally utilized the lands and waters on both sides of the Strait of Georgia through annual movements and activities associated with resource access and trading opportunities. Ts'uubaa-asatx Nation emphasized that their traditional activities were intrinsically linked to generating enough goods for trading, which was necessary for gaining access, through trade, to specific resources only available from lower mainland and up-river

[194] Indigenous and Northern Affairs Canada. 2021. First Nation Profiles – Ts'uubaa-asatx, https://fnp-ppn.aadnc-aandc.gc.ca/fnp/Main/Search/FNRegPopulation.aspx?BAND_NUMBER=643&lang=eng, accessed December 9, 2021.

[195] Hul'qumi'num Treaty Group Statement of Intent. BC Treaty Commission website. http://www.bctreaty.ca/sites/default/files/Hul-qumi-num_Treaty_Group_SOI_Map2.pdf, accessed May 29, 2019.

[196] Hul'qumi'num Treaty Group Statement of Intent. BC Treaty Commission website. http://www.bctreaty.ca/sites/default/files/hul%27qumi%27num%202.pdf, accessed May 28, 2019.

groups. For example, Ts'uubaa-asatx Nation had traditional trading ties with up-river groups, which Ts'uubaa-asatx Nation traded for goat wool, which could be used by Ts'uubaa-asatx people to create innovative wool blends for staying warm and dry over the winter.

Ts'uubaa-asatx Nation assert Aboriginal right to camp, fish, hunt, and gather food within its mainland traditional territory based on historic use, but current use of these areas are limited by members due to concern about pollution, reduced access, and the conservation status and declines in fish stocks. Ts'uubaa-asatx Nation report that members historically accessed the area for inter-governmental relations, inter-community cultural events (e.g., weddings), trade, fishing, gathering, hunting, and other traditional and cultural activities. Ts'uubaa-asatx Nation identified that approaches to the Fraser River were an important place for hunting seals and sealions and harvesting crab and other fish. Traditional fishing practices exercised historically and currently include following the fish run from Johnston Strait down through Georgia Strait and into the Fraser River[197]. Ts'uubaa-asatx Nation also identified historical camp sites near the Pattullo Bridge Replacement Project, which was an important site related to trade, harvesting, inter-governmental or -community relations, such as naming ceremonies, and marriages for example.

Traditional uses of resources by Ts'uubaa-asatx Nation have continued into modern times and that is why Ts'uubaa-asatx Nation is active in various working groups and initiatives aimed at protecting Ts'uubaa-asatx Nation's resources. Ts'uubaa-asatx Nation takes its role as stewards of its traditional territory very seriously and works towards a reawakening of Ts'uubaa-asatx Nation culture, language, song, dance, and heritage. Ts'uubaa-asatx Nation is also documenting traditional sites within its traditional territory and has signed a "Memorandum of Understanding: First Nation Heritage Site Conservation in Hul'qumi'num Tumuhw" with the province[198].

[197] As reported to the EAO at a meeting with Lake Cowichan First Nation on July 6, 2018.

[198] MOU – MTSA and HTG_First Nation Heritage Conservation in Hul'qumi'num Tumuhw – 2007. https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/natural-resource-use/archaeology/forms-publications/hulquminum_treaty_group_mou.pdf.

14.2.2 TS'UUBAA-ASATX NATION'S INVOLVEMENT IN THE CONSULTATION PROCESS

Ts'uubaa-asatx Nation have identified that the work involved in reviewing major projects within its territory is labour-intensive and highly diversely technical. Ts'uubaa-asatx Nation also consider that this issue is particularly problematic for smaller Indigenous Groups, such as Ts'uubaa-asatx Nation, which are limited in capacity due to its size, but still have a high number of projects in its territory. Ts'uubaa-asatx Nation has responded to this challenge by setting a strategic vision for multiple projects being proposed in the Lower Mainland portion of its traditional territory.

According to its visions, goals, and objectives for the South Arm of the Fraser River, Ts'uubaa-asatx Nation envisions clean air, water, and land; healthy fish and wildlife populations and healthy habitat for these creatures and for humans to thrive. A place where Ts'uubaa-asatx Nation can be in health, happiness, and harmony[199]. Ts'uubaa-asatx Nation's goals are to re-establish traditional uses and occupancy in the lower mainland, taking up key strategic opportunities as they arise over the next 3 - 10 years. Ts'uubaa-asatx Nation has also developed an advocacy policy for the South Arm of the Fraser River and its approaches that seeks to inform the consultation process but is not meant to replace consultation with Ts'uubaa-asatx Nation[200]. Through its vision, goals, and advocacy policy, Ts'uubaa-asatx Nation intends to revitalize its traditional practices in the area, targeting fishing, hunting, and harvesting over the next 3 - 10 years. With respect to the EA for TMJ, Ts'uubaa-asatx Nation noted that its advocacy policy is not a replacement for consultation, and that the information outlined in the policy would likely not include all applicable mitigation measures because it was not developed in consideration of LNG jetty operations or LNG vessel activities specifically.

The EAO is of the view that it has approached consultation with Ts'uubaa-asatx Nation at the deeper end of the spectrum, with the intent to identify potential impacts and consider ways to address potential impacts to any Aboriginal Interests in the project area identified by Ts'uubaa-asatx Nation. The EAO set out its approach to consultation, including initial assessments of strength of claim and potential impacts on Ts'uubaa-asatx Nation's Aboriginal Interests in a letter to Ts'uubaa-asatx Nation dated June 18, 2015. Based on the Province's initial

[199] Ts'uubaa-asatx Nation: Vision, goals, and objectives for the south arm of the Fraser River and its Approaches (dated June 1, 2018).

[200] Ts'uubaa-asatx Nation Policy: South arm of the Fraser River and Approaches (dated June 1, 2018).

assessments, Ts'uubaa-asatx Nation was consulted at the deeper end of the spectrum as set out in Schedule B of the Section 11 Order for TMJ, including Ts'uubaa-asatx Nation's participation in the Working Group.

During the pre-Application phase the EAO invited the Ts'uubaa-asatx Nation to review and provide comments on the draft Section 11 Order, the draft VC Selection document, and the draft AIR. During the review of TJLP's original Application, the EAO invited Ts'uubaa-asatx to review and provide comments on TJLP's Aboriginal Consultation Plan and Reports, the screening of the Application and on the Application and supplemental material, as well as the opportunity to review and comment on several iterations of the EAO's draft decision materials. As part of the EA Working Group, Ts'uubaa-asatx Nation was invited to participate in technical meetings, teleconferences, and site visits during the Pre-Application and review of TJLP's original Application. During the review of TJLP's BVSA Report, was invited to review TJLP's report and the EAO's updated materials and participated in Working Group meetings. During the review of TJLP's BVSA Report, Ts'uubaa-asatx Nation participated at three Working Group meetings and raised concerns about potential effects of additional bunker vessel calls on fish and fish habitat in the lower River, management of GHGs, and cumulative effects to wildlife. Ts'uubaa-asatx Nation also indicated interest in the air quality improvements that result from transitioning ships to LNG as a fuel from marine diesel. Ts'uubaa-asatx Nation requested further information on the Port of Vancouver process regarding bunkering regulations and where bunkering is occurring now and requested a presentation from Port of Vancouver. The Port of Vancouver gave a presentation to the Working Group on April 12, 2022, and the meeting notes and presentation were shared with the Working Group. Ts'uubaa-asatx Nation was not able to attend that Working Group meeting but has followed up to receive that presentation with TJLP.

The EAO met directly with Ts'uubaa-asatx Nation several times throughout the EA to understand Ts'uubaa-asatx Nation's desired approach to consultation on the EA. Ts'uubaa-asatx Nation shared information about their draft Lower Mainland Advocacy Policy that is applicable to activities in the South Arm of the Fraser River and identifies Ts'uubaa-asatx Nation's vision, goals, and approaches to the area, noting that this does not replace the requirement for consultation. The EAO heard from Ts'uubaa-asatx Nation that it wants the province to start setting clear goals and objectives to improve the overall ecosystem health in the Fraser River.

TJLP began consulting with Ts'uubaa-asatx Nation in 2014 before entering the EA process, through a letter introducing TJLP and TMJ. TJLP reports that consultation and information-sharing events have included face-to-face meetings, letters, email exchanges and phone calls.

The EAO is aware that TJLP provided funding for Ts'uubaa-asatx Nation for a TMJ-specific study regarding their Aboriginal Interests in the area of TMJ, and also provided additional funding to support Ts'uubaa-asatx Nation's review of the Application and other review stage consultation activities (e.g., review of TJLP's BVSA Report), including participation in EAO-led Working Group meetings. A summary of TJLP's engagement activities with the Ts'uubaa-asatx Nation members is provided in the Application and in TJLP's Aboriginal Consultation Reports.

During its review of TJLP's BVSA Report and the EAO's Assessment Report, Ts'uubaa-asatx Nation identified five key outstanding issues with TMJ. These issues included: 1) potential for greater cumulative effects due to increased vessel traffic in the South Arm of the lower Fraser River; 2) potential increased risk of vessel strikes to fish, including white sturgeon, as well as, marine mammals in the Project area due to increase vessel traffic; 3) lack of a regional vessel management plan for the South Arm of the Fraser River; 4) lack of project condition that would require TJLP to contribute to long-term fish monitoring or mapping initiatives, despite the strategic location of the project; and 5) concern that Ts'uubaa-asatx Nation would have no influence over studies or initiatives derived through TJLP's proposed nonconventional offset proposal to the FNFLF (Ts'uubaa-asatx Nation is not a participating member of FNFLF).

The EAO, in consultation with Ts'uubaa-asatx Nation, ensured that these key outstanding concerns were included in the EAO's Assessment Report, including the section below. The EAO heard from Ts'uubaa-asatx Nation that while, it considers that TMJ would have a positive role in transitioning bunkering of marine fuel in the Port of Vancouver, it has concerns related to TMJ's contribution to cumulative effects in the Fraser River. The EAO understands that discussions between Ts'uubaa-asatx Nation and TJLP about these outstanding issues are ongoing, but that a bilateral Mutual Benefits Agreement had not been agreed to between the two parties by the time that the EAO referred TMJ for decision.

14.2.3 POTENTIAL IMPACTS TO ABORIGINAL INTERESTS

The following sections focus on potential impacts of TMJ to Ts'uubaa-asatx Nation's Aboriginal Interests. A discussion of the EAO's assessment approach is provided in the Impact Assessment Methods section of Part C (Section 12.2). The EAO considered the information available, including from public sources as well as relevant issues raised by Ts'uubaa-asatx Nation and members during the EA process (in meetings, letters, and Working Group comments), in the following assessments of the potential impacts of TMJ on Ts'uubaa-asatx Nation's Aboriginal Interests. The following sections focus on potential impacts of TMJ to Ts'uubaa-asatx Nation's

Aboriginal right to fish, hunt, trap and gather, and mitigations and accommodations to address potential impacts.

A. POTENTIAL IMPACTS ON FISHING

Ts'uubaa-asatx Nation reported that that it used to travel to the Fraser River every year to camp, gather food, fish, hunt, trade, and for other traditional and cultural purposes, which includes the area where the TMJ site is proposed today. As described in Ts'uubaa-asatx Nation's 2017 report on its interests related to the Pattullo Bridge Replacement Project (approximately 13 km upstream of the TMJ project site), Ts'uubaa-asatx Nation asserts its Aboriginal rights to camp, fish, hunt and otherwise move about "the waters and immediately adjacent terrestrial areas of the Fraser River"[201]. During the Pattullo Bridge Replacement EA, Ts'uubaa-asatx Nation reported that their members have not used the area since about 1960[201] but the EAO also understands that Ts'uubaa-asatx Nation's traditional and current fishing practices include following the fish run from Johnston Strait down through Georgia Strait and into the Fraser River[197].

Ts'uubaa-asatx Nation reported that its members consider it is not currently safe to harvest resources in the Fraser River delta because of concerns about over-population and pollution[201], that that there is reduced access for its members in the South Arm of the Fraser River, and that there are conservation concerns from the declines in Fraser River fish stocks. Ts'uubaa-asatx Nation maintains that members have an Aboriginal right to camp, fish, hunt and gather food in the South Arm of the Fraser River based on historic use and, in accordance with its visions, goals, and objectives for the area, Ts'uubaa-asatx Nation would like to exercise its rights in the area in the future, if the area was to be cleaned up and made safe again.

Regarding the MSA area, Ts'uubaa-asatx Nation previously reported that one of their FSC fishers harvested fish at the mouth of the Fraser River and Roberts Bank in two of the last three years (as of 2015). Ts'uubaa-asatx Nation reported that two species of salmon have been targeted at Roberts Bank; sockeye and spring with each species harvested annually (spring through fall).

[201] Ts'uubaa-asatx Nation. 2017. Pattullo Bridge Replacement Project, prepared by Haa'yuups, November 28, 2017, referenced in MOTI. 2018. Pattullo Bridge Replacement Project EAC Application, Part C Section 12.0 Aboriginal Consultation. https://www.projects.eao.gov.bc.ca/api/public/document/5b7343562400e50024428f13/download/Section%2012.0_Aboriginal%20Consultation.pdf.

Ts'uubaa-asatx Nation raised the following concerns regarding potential impacts on the right to fish due to TMJ, including identifying that these concerns are being emphasized in response to TJLP's BVSA, because the increased bunkering vessel traffic would increase potential for such negative effects to fish and fish habitat, especially increased harm and mortality due to vessel strikes, changes in behaviour or habitat due to increased vessel traffic:

- Concern regarding the effect of TMJ on fish (including juvenile recruitment) and fish habitat in the area, particularly juvenile sturgeon and eulachon, and concerns that the DFO reduced-work window does not consider sturgeon. Ts'uubaa-asatx Nation note that it often gets fish from or fishes with the other Indigenous Groups on the Fraser River and has a share in a commercial licence.

- Concerns related impacts to fish and fish habitat, including changes to habitat due to dredging, infrastructure and vessel traffic resulting in loss or modification of habitat, changes in fish behaviour or use of the site, and harm and mortality due to vessel strikes, or habitat disturbances due to vessel traffic or dredging.

    - See Section 13.3.1 for a detailed discussion of the analysis and resolution of concerns related to impacts to fish, including sturgeon. As discussed in that section, the proposed mitigation measures to address concerns about fish, including sturgeon, are included in the recommended KMM under CEAA 2012 for Fish Mitigations to Reduce Harm and Mortality, a Fish Habitat Offset Plan, and a follow-up program for effectiveness of fish and fish habitat mitigations. Fish Mitigations to Reduce Harm and Mortality, includes use of reduced-risk work windows, identification of, and justification for, any work that would occur outside of the windows, monitoring for fish presence during in-water works with criteria and triggers to modify or stop in water works, and underwater noise monitoring and mitigation activities. The Fish Habitat Offset Plan requires offsetting habitat to provide a higher value than the fish habitat it is replacing, contingency measures and associated monitoring measures to be put into place if the offsetting measures are not successful in offsetting the residual loss or impacts on fish habitat resulting from TMJ, and monitoring measures to assess effectiveness of the offsetting measures, until offset habitat meets performance standard.

In addition to the above summary of concerns, Ts'uubaa-asatx Nation raised specific concerns regarding the effect of TMJ on eulachon and sturgeon in the area, including that

the proposed methods for monitoring may be problematic or insufficient for these, and other fish in the lower Fraser River.

- Ts'uubaa-asatx Nation identified that the specific monitoring techniques proposed by TJLP may be problematic for detecting juvenile or small-sized adult fish such as eulachon and juvenile sturgeon, highlighting that the lower size detection limit of side scan sonar is approximately 40 – 60 cm.
- Ts'uubaa-asatx Nation also identified that eulachon do not have swim bladders, so monitoring for eulachon mortality needs to also consider that dead eulachon would not float to the surface like other fish would.
- Ts'uubaa-asatx Nation identified a concern that there is limited information available on gravel beds used by eulachon in the lower Fraser River, and that dredging activities associated with TMJ would have the potential to reduce juvenile recruitment and habitat use in the area due to disturbances to the habitat.
    - As described in the Part B chapter on Fish and Fish Habitat (Section 5.6), TJLP has undertaken additional eulachon spawning habitat characterization in the spring of 2020 and an in-river eulachon spawning assessment during the 2021 spawning season to address uncertainty in the potential for eulachon spawning habitat within the proposed dredge area.
- Ts'uubaa-asatx also identified that eulachon can sometimes return to the river as early as December, so if there is dredging activities going on in December, the monitoring program should use appropriate measures to determine presence of Eulachon in the area.
- The EAO is aware that Ts'uubaa-asatx Nation has requested that TJLP consider the use of an Aquatic Zooplankton and Fish Profiler (AZFP) in addition to side-scan sonar for monitoring for smaller adult fish or juvenile sturgeon at the site.
    - The EAO and Ts'uubaa-asatx Nation liaised with the province's Senior Aquatic Biologist regarding Ts'uubaa-asatx Nation's concerns about monitoring for juvenile sturgeon and eulachon and the province's ongoing conservation and monitoring programs in the area.
    - The EAO understands that LWRS (previously FLNRORD) are aware of the limitations of side scan sonar with respect to juvenile sturgeon or small adult fish; however, LWRS, in conjunction with the VFPA have implemented broad juvenile fish monitoring projects ongoing in the Fraser River, which are using

targeted juvenile angling as the preferred method to capture younger/small size classes. The VFPA is also developing a juvenile sturgeon habitat use mapping component.

- The EAO also understands that juvenile sturgeon habitat use at the TMJ site varies even more than adult or sub-adult so there are added challenges that TJLP will need to consider, should TMJ proceed to the post-EA/permitting phase.
- The EAO is aware that, while AZFP technology may have limitations, it, and potentially other more commonly used methods that would be suitable for the TMJ site-specific conditions, could likely be expanded to meet these ongoing concerns.
- The EAO also understands that TJLP is interested in developing a monitoring program during in-water activities that can detect species like eulachon. TJLP anticipates that it will implement monitoring during windows identified by Ts'uubaa-asatx and other Indigenous Groups, with the expectation that this monitoring may support adaptive responses identified during management plan development, should TMJ proceed. The EAO heard that TJLP looks forward to developing more details about its monitoring program through ongoing engagement with Ts'uubaa-asatx Nation and that in addition to working with Ts'uubaa-asatx Nation on management plan development, TJLP will offer capacity funding to support engagement on the management plans.
- The EAO is also of the view that side scan sonar was discussed earlier in the EA for TMJ to address the concerns related to detecting adult sturgeon that may start to use the site once the dredge pocket has been established, but there may be other technology options to better detect juveniles or smaller size adult fish. The EAO heard that TJLP is interested in continuing the discussion during permitting, and that it anticipates collaborative development of management plans with Indigenous Groups should TMJ proceed.
- See Section 13.3.1 for a detailed discussion of the analysis and resolution of concerns related to impacts to eulachon and sturgeon. The EAO is recommending KMMs under CEAA 2012 for Fish Mitigations to Reduce Harm and Mortality, a Fish Habitat Offset Plan, and a follow-up program as described above. The Fish and Fish Habitat Monitoring and Mitigation Plan would also

require monitoring outside of the DFO least risk window (which includes eulachon) and additional mitigations measures.

- Concern regarding the reduction of access to the Fraser river and TMJ's marine terminal area due to the warning signs and notifications regarding elevated public risk, when vessels would be berthing, loading, or de-berthing at TMJ. Ts'uubaa-asatx Nation identified that its members are not currently practicing their Aboriginal rights in the South Arm of the lower Fraser River because there is lack of access to camping spots, reduced fishing opportunities due to conservation concerns, it is a highly industrialized area with lots of vessel traffic, and that infrastructure associated with TMJ (i.e., pilings associated with the jetty) would remove further areas of access in the river for Ts'uubaa-asatx Nation. Ts'uubaa-asatx Nation also identified additional concerns related to the cumulative effects of increased vessel traffic under the BVS and identified that a regional vessel management plan would be useful to manage the ongoing and increasing cumulative effects in the South Arm of the Fraser River due to vessel traffic.
    - See Section 13.3.1 for a detailed discussion of the analysis and resolution of concerns related to access to the fish harvesting areas in the lower Fraser River.
    - The EAO is recommending as KMMs under CEAA 2012 for a Marine Communications Plan, a Marine Access and Transportation Plan and a Vessel Traffic Management Plan. These plans would identify the procedures of communication to Indigenous Groups and identification of mitigations to reduce disruptions caused by Construction and Operations for members of Indigenous Groups to carry out traditional use activities, including fishing for FSC purposes.
- Ts'uubaa-asatx Nation identified that it would like the mitigation measures to include enhanced monitoring to better understand use of the dredge pocket by fish, and the TMJ site, by all sizes of sturgeon and other fish, especially due to the uncertainty associated with the vessel strikes on sturgeon under the BVSA. Consistent with its advocacy policy for the South Arm of the Fraser River, Ts'uubaa-asatx Nation has identified that it has an interest in understanding how fish (e.g., eulachon, white sturgeon, salmon) are currently using the site, how the use may be affected by the jetty operations, with an overall objective to understand how fish are using the river at more of a regional scale eventually. Ts'uubaa-asatx Nation also identified that enhanced monitoring should be used to inform adaptive management and inform the mitigation measures for TMJ.

- The EAO is aware that sturgeon use in this general portion of the river varies considerably based on season, time of day, food sources, flow etc., and as mentioned above, juvenile sturgeon habitat use at this site likely varies even more than adult or sub-adult use.
- As described in Part B section of Fish and Fish Habitat (Section 5.6), the EAO revised its conclusions on the duration of effects to Fish and Fish Habitat to reflect that the alteration effect to habitat due to repeated dredging may result in effects that extend to the longer term (i.e., life of project) as the dredge pocket may not have sufficient time between dredge events to recover.
- The EAO is of the view that, with respect to sturgeon, TJLP's Application and related memos and supplemental information did an adequate job of describing the current habitat use by sturgeon at the site, but the details are currently limited with respect to the proposed post-dredge monitoring of habitat for use by sturgeon and TJLP's plans for adaptive management and enhanced mitigation measures based on those results.
    - The EAO has considered the existing uncertainty, including the importance of the area as eulachon and sturgeon habitat and the degree to which dredging would alter habitat over the long-term, and proposed mitigations in its conclusions in Part B. As part of the recommended KMMs under CEAA 2012, the follow up program for effectiveness of fish and fish habitat mitigations, would be expected to reduce this uncertainty and would include an adaptive management component to mitigate effects.
- The EAO also notes that BC is committed to lead in developing a provincial, basin-wide management plan for the Fraser River white sturgeon in collaboration with federal and First Nation governments. In July 2022, the Province issued a draft Terms of Reference for the B.C. Fraser River White Sturgeon Management Plan[202].

- As described in Section 13.3.1.1.3, Ts'uubaa-asatx Nation raised concerns that TJLP's BVSA Report does not include a socio-economic assessment, and that under the BVS the Project could have effects on vegetation, cultural heritage and archaeology sites, noise, GHGs, and

[202] For more information, refer to https://www2.gov.bc.ca/assets/gov/environment/plants-animals-and-ecosystems/fish-fish-habitat/fishery-resources/fraser-river-white-sturgeon/terms_of_reference_fraserstugeonmanagementplantor_29sep2022.pdf

wildlife habitat. The EAO also heard from Ts'uubaa-asatx Nation there is concern regarding how the additional bunker vessel calls may affect juvenile recruitment of white sturgeon and eulachon in the lower Fraser River. Ts'uubaa-asatx Nation has noted that Indigenous people are voluntarily not fishing sturgeon to conserve the stock.

  - The EAO evaluated the potential for BVS-related changes to relevant pathways of effects on the biophysical, geospatial, and other social, cultural, experiential sub-components of Aboriginal fishing rights summarized in Section 13.3.1.2 and is satisfied that those findings would apply to Ts'uubaa-asatx Nation. The EAO's response to concerns and issues raised by Indigenous Groups regarding the BVSA can be found in the Fish and Fish habitat section of Part B (Section 5.6) as well as in Section 13.3.1.1.3 of Part C.
  - As described in Section 13.3.2 and Section 13.3.3 of Part C the EAO did not identify any changes to relevant pathways of effects to Aboriginal interests related to any socio-economic VCs, vegetation, cultural heritage, archeology sites, noise, GHG management, and wildlife, marine birds, or wildlife habitat.

- In its review of TJLP's contribution proposal to the FNFLF, Ts'uubaa-asatx Nation raised concern that the proposal would exclude it from participating in governance and decision-making and requested that TJLP set up a contractual arrangement for the contribution to involve all Schedule B Indigenous Groups in decision-making.
- Ts'uubaa-asatx Nation also identified that there are other ongoing programs happening in the Fraser River related to studying stocks of concern, and restoration of fish habitat and wetlands, and that Ts'uubaa-asatx Nation has an expectation that TJLP commit to long-term restoration efforts in the lower Fraser River, and that the contribution would be commensurate with TMJ's contribution to cumulative effects.
  - As described in Section 13.1, in consideration of the feedback received from Indigenous Groups, the FNFLF, TJLP and WG members, the EAO considers the proposed contribution as relevant context for decision makers. While the EAO considers the proposed contribution as TJLP working towards fostering better long-term relationships with some Indigenous Groups, the EAO is not recommending the contribution as a mitigation measure due to limited effectiveness monitoring for such indirect offsetting over the life of the TMJ.

14.2.3.1.1 Conclusion

The EAO predicts that TMJ alone would have a **minor** impact to the fishing rights of Ts'uubaa-asatx Nation. In consideration of the available information, the EAO's consultation with Ts'uubaa-asatx Nation, Ts'uubaa-asatx Nation's engagement with TJLP, TJLP's commitments, the EAO's proposed EAC conditions if an EAC is issued and recommended KMMs under CEAA 2012, TMJ-related effects combined with cumulative effects is expected to result in a **minor-to-moderate** impact on the fishing rights of Ts'uubaa-asatx Nation.

The EAO predicts that TMJ would interact with current baseline levels of cumulative effects that already have a combined negative impact to Ts'uubaa-asatx Nation's availability of resources, access to fishing areas and the experience of fishing in the South Arm of the Fraser River and to a lesser extent the Salish Sea. These cumulative effects are compounded by the importance of this area for access and for fish harvesting to Ts'uubaa-asatx Nation's cultural and traditional interests and that TMJ-related vessels would operate in a relatively confined and heavily utilized marine environment, which increases the seriousness of impact on Ts'uubaa-asatx Nation's right to fish.

The EAO considered Ts'uubaa-asatx Nation's perspectives on cumulative effects and Ts'uubaa-asatx Nation's concern about existing cumulative activities in the South Arm of the Fraser River that were impacting their ability to meaningfully use the area to access fisheries resources, and for other traditional and cultural purposes. The EAO acknowledges that there are already vessels transiting the lower Fraser River which can impact Indigenous fishers' access to and quality of experience of fishing. While the EAO recognizes there is some uncertainty when considering how cumulative effects impact Aboriginal Interests, the EAO agrees with Ts'uubaa-asatx Nation, that any increase in vessel traffic at the lower Fraser River would potentially be more serious when combined with past, present, and reasonably foreseeable activities

The key factors that were considered in support of the EAO's conclusion on the impacts to the right to fish are summarized as follows:

Biophysical:

- The EAO's conclusions in the Fish and Fish Habitat in Part B that TMJ would have potential to result in low magnitude residual effects to fish and fish habitat at the TMJ site, and low magnitude residual effects to sturgeon from vessel strikes. The EAO did not predict residual effects to fish in the MSA area;
- Ts'uubaa-asatx Nation are voluntary not harvesting eulachon and sturgeon currently due to conservation concerns; and

- The lower Fraser River is highly industrial and the TMJ site is previously disturbed. The MSA area is a heavily utilized marine environment. These factors increase the seriousness of impact of TMJ on the right to fish.

Geospatial (places, sites and access):

- During construction, access to the TMJ site would be restricted for three years. During operations, Indigenous mariners and fishers would avoid entering and remaining in the marine terminal area due to the warning signs and notifications regarding elevated public risk, in particular when vessels would be berthing, loading, or de-berthing at TMJ. At the scale of the LAA and RAA this would amount to a low magnitude impact to access from impacts at the TMJ site;
- The EAO's conclusions in the Current Use chapter in Part B found that TMJ-related vessel transits would have negligible to low magnitude effect to access to fishing compared to baseline numbers of vessel transits, that could be experienced as higher in the Fraser River as a change from baseline compared to Salish Sea. This effect would be due to and the regularly occurring (i.e., average of one vessel call per day under the BVS), short-duration vessel movements to pass through known fishing areas in the Fraser River and Salish Sea; and
- Ts'uubaa-asatx Nation seeks to resume fishing in the Fraser River.
- Specific to the BVS there is potential for higher frequency of interactions to occur between TMJ-related vessels and Indigenous Groups engaging in vessel-based FSC fishing in the lower Fraser River during FSC fishing windows. This effect would apply to Ts'uubaa-asatx Nation should members engage in vessel based FSC fishing activities in the lower Fraser River in the future.

Social, Cultural and Experiential:

- As outlined in the Current Use of Lands and Resources for Traditional Purposes and Cultural Heritage assessment in Part B, potential negligible to low magnitude impacts to the experiential aspect of fishing in the vicinity of the TMJ site and Salish Sea due to a change in noise and visual quality during construction and to changes in visual quality and potential concerns regarding safety during operations in the Fraser River and Salish Sea.

Mitigations:

- Proposed mitigations for potential impacts to Ts'uubaa-asatx Nation's right to fish include mitigations to reduce impacts to noise and visual quality in the CEMP and OEMP as well as the recommended key mitigations under CEAA 2012, specifically the Fish and

Fish Habitat Monitoring and Mitigation Plan, the Fish Habitat Offset Plan, the Marine Communication Plan, the Marine Access and Transportation Plan and the Vessel Traffic Management Plan.

- Ts'uubaa-asatx Nation have requested that to address the increasing cumulative effects to access for Indigenous Groups in the South Arm of the Fraser River a regional vessel management plan is required.

B. POTENTIAL IMPACTS ON HUNTING, TRAPPING AND GATHERING

As described in Ts'uubaa-asatx Nation's 2017 report on its interests related to the Pattullo Bridge Replacement Project, Ts'uubaa-asatx Nation asserts Aboriginal rights to camp, fish, hunt and otherwise move about "the waters and immediately adjacent terrestrial areas of the Fraser River"[201]. Ts'uubaa-asatx Nation reported that that they used to travel to the Fraser River delta to gather food, fish, and hunt every year, which would include where the TMJ site is proposed today. Ts'uubaa-asatx Nation identified that traditionally gathered plants from the area, such as blueberries and cattails for example, which were harvested in the South Arm of the Fraser River. Ts'uubaa-asatx Nation reported that its members do not currently hunt in the area because population density and proximity make the use of firearms patently unsafe, and because of industrial pollution[201].

Ts'uubaa-asatx Nation maintained that they have an Aboriginal right to camp, fish, hunt, and gather food in the Fraser River based on historic use[201]. Ts'uubaa-asatx Nation reported that, while its members are not currently using the area to harvest resources, there is a future desire for members to be able to exercise their rights in the area in the future if the area was to be cleaned up and made safe again. Regarding the MSA area, Ts'uubaa-asatx Nation members reported harvesting eelgrass at Roberts Bank in the intertidal zone as well as harvesting ducks, specifically mallards and coots. They have previously expressed concern regarding the diminishing numbers of these and other marine birds.

Ts'uubaa-asatx Nation expressed the desire to guard, maintain, and protect Ts'uubaa-asatx Nation's traditional historical access and rights to the Fraser River area into the future. They also raised the issue that they would like to see the areas restored to a healthy state.

Ts'uubaa-asatx Nation raised the following concerns regarding potential impacts on the right to hunt, trap and gather due to TMJ:

- Concerns regarding noise disturbance and light pollution acting as a stressor to wildlife, weakening their immune systems, disturbing migration patterns, and disorienting them during daily activities.
    - See Section 13.3.2 for a detailed discussion of the analysis and resolution of concerns related to effects of noise and light on wildlife. As discussed in that section, the proposed mitigation measures to address the effects of noise and light on wildlife include the Wildlife Habitat Management Plan, and light and noise management components of the CEMP and OEMP, all of which would require consultation with Indigenous Groups. The EAO is also proposing these mitigations as KMMs under CEAA 2012 which would include the requirements for lighting, noise and wildlife and wildlife habitat management and monitoring.

The EAO evaluated the potential effects on hunting, trapping, and gathering rights attributable to TMJ which apply broadly to Indigenous Groups. These potential effects are summarized in Section 13.3.2. The EAO is satisfied that the key impacts to biophysical components resulting in changes to wildlife and vegetation quantity and quality, changes in access to hunting, trapping and gathering areas, and changes to social, cultural, and spiritual values associated with traditional hunting, trapping and gathering activities summarized in that section apply to Ts'uubaa-asatx Nation.

14.2.3.1.2 Conclusion

In consideration of the available information, consultation with Ts'uubaa-asatx Nation, Ts'uubaa-asatx Nation's engagement with TJLP, TJLP's commitments, the EAO's proposed EAC conditions if an EAC is issued and the recommended KMMs under CEAA 2012, TMJ is expected to result in a **negligible** impact on Ts'uubaa-asatx Nation's right to hunt, trap and gather.

The key factors that were considered in support of the EAO's conclusion on the impacts to the right to hunt, trap and gather are summarized as follows:

Biophysical:

- The EAO's conclusions at the TMJ site on adverse residual effects to Wildlife and Wildlife Habitat and Vegetation (see respective sections in Part B) indicate negligible to low magnitude residual effects on loss or alteration of wildlife habitat, sensory disturbance from noise and light, and mortality; as well as low magnitude residual effects on wetland and riparian ecosystems;
- The EAO's conclusions in the MSA area on adverse residual effects to Marine Birds (see Wildlife section in Part B) indicate negligible to low magnitude residual effects related to

mortality;

- Terrestrial wildlife species of cultural importance to Ts'uubaa-asatx Nation have either not been found within the TMJ site or are not anticipated to be affected by the TMJ-related activities; and

Geospatial (places, sites and access):

- Ts'uubaa-asatx Nation do not currently harvest in the TMJ area but seek to re-establish harvesting practices in the area;
- Ts'uubaa-asatx Nation traditionally gathered plants from the area, such as blueberries and cattails for example, which were harvested in the South Arm of the Fraser River.
- In the MSA area, Ts'uubaa-asatx Nation members reported harvesting eelgrass as well as ducks, specifically mallards and coots, at Roberts Bank;
- Construction (just over three years in duration) and operation (30 years) is unlikely to cause disruptions to Ts'uubaa-asatx Nation's access to areas traditionally used for hunting, trapping, and gathering activities at the TMJ site or in the MSA area; and
- The upland portion of the TMJ site is situated on fee simple (private) land.

Social, Cultural and Experiential:

- Potential impacts to experience in the vicinity of the TMJ site and along the shipping route due to a change in noise and visual quality, as described in Part B, during construction and operations which are anticipated to be negligible to low in magnitude in the Fraser River and Salish Sea.

Mitigations:

- Proposed conditions to mitigate impacts to Ts'uubaa-asatx Nation's right to hunt, trap and gather are the vegetation and wetland management, wildlife and wildlife habitat management, light management, and noise management components of the CEMP and OEMP, all of which would require consultation with Indigenous Groups. The EAO is also proposing these mitigations as KMMs under CEAA 2012 which would include the requirements for vegetation and wetland creation and restoration, lighting, noise and wildlife and wildlife habitat management and monitoring; and
- All vessels would adhere to the Marine Regulations and Legislation regulating vessel noise and lighting.

C. POTENTIAL IMPACTS ON OTHER TRADITIONAL AND CULTURAL INTERESTS

As described in Ts'uubaa-asatx Nation's 2017 report on its interests related to the Pattullo Bridge Replacement Project, Ts'uubaa-asatx Nation asserts Aboriginal rights to camp, fish, hunt and otherwise move about "the waters and immediately adjacent terrestrial areas of the Fraser River"[201]. Ts'uubaa-asatx Nation stated that they historically enjoyed a right to visit the area of the Fraser River on an annual basis. These annual visits are said to have involved setting up camps to fish, hunt and visit relatives in the area. Ts'uubaa-asatx Nation also identified annual visits involved inter-governmental and -community relations, and participation in other cultural activities, including marriages and naming ceremonies for example

Ts'uubaa-asatx Nation reported that that it is in the process of locating members that dispersed in the wake of the residential school era, and well over 100 individuals with Ts'uubaa-asatx ancestry have been located to date[201]. Several of these individuals have expressed interest in returning to the community on Cowichan Lake. Ts'uubaa-asatx Nation expects that the community will grow and have expressed their desire for their returning members to learn about and be able to exercise their rights in the Fraser River area.

Ts'uubaa-asatx Nation raised the following concerns regarding potential impacts on other traditional and cultural interests due to TMJ:

- Concern regarding the potential impact TMJ would have on *Tl'uqtinus* which is located across from the TMJ site. Ts'uubaa-asatx Nation notes that there were historically houses on both sides of the river and Ts'uubaa-asatx Nation used to travel there for trade. This was, and continues to be, an important area to Ts'uubaa-asatx Nation.
    - See Section 13.3.3 for a detailed discussion of the analysis and resolution to concerns regarding access and use of the *Tl'uqtinus* Lands. Proposed provincial conditions to mitigate impacts to cultural heritage are the development of the Cultural and Archaeological Resources Management Plan for the TMJ site, the Lighting Management, Noise and Vibration Management and Air Quality Management as part of the CEMP and OEMP as well as the Water Quality Management Plan and the Indigenous Cultural Awareness and Recognition Condition, and the recommended KMMs under CEAA 2012 for the Marine Access and Transportation and Marine Communications Plans.
    - The Marine Access and Transportation Plan would include a description of mitigations to reduce disruptions caused by construction and operations for members of Indigenous Groups to carry out traditional use activities. The Vessel Traffic Management Plan would include speed limits, where safe, within the Fraser

River and MSA area, and commit TMJ-related vessels to following established shipping routes and maintaining a constant course.

The cultural importance and role of SRKW as an indicator of cultural health of the ecosystem was identified by Ts'uubaa-asatx Nation during the Robert's Bank Terminal 2 Panel process. Through the RBT2 process, Ts'uubaa-asatx Nation described SRKW as culturally important, including being featured in stories, legends, cultural transmission through teaching stories.

14.2.3.1.3 Conclusion

The EAO predicts the TMJ-related marine shipping effects alone would have **negligible-to-minor** impacts Ts'uubaa-asatx Nation's other cultural and traditional interests, although EAO acknowledges that there is uncertainty in the relationship between incremental increases in shipping and the availability of cultural resources, such as SRKW. However, in consideration of the available information in Section 13.3.3, the EAO's consultation with Ts'uubaa-asatx Nation, Ts'uubaa-asatx Nation's engagement with TJLP, TJLP's commitments and the EAO's proposed EAC conditions if an EAC is issued, the EAO concludes that TMJ-related marine shipping effects combined with cumulative effects in the MSA area is expected to result in a **moderate-to-serious** impact on Ts'uubaa-asatx Nation's other traditional and cultural interests. The EAO's conclusions of significant cumulative effects to SRKW was a major key factor considered in the EAO's seriousness determination. The EAO notes several regional initiatives and measures have been implemented by the Government of Canada to better understand and manage cumulative effects on the recovery of SRKWs (listed in Section 13.1.1).

The key factors that were considered in support of the EAO's conclusion on the impacts to other traditional and cultural interests are summarized as follows:

Cultural and Heritage Resources:

- The EAO's conclusions in the Heritage Resources section of Part B found no residual effects to Heritage Resources (Section 7.1) from erosion due to wake effects along the shorelines of the Fraser River in the RAA or in the MSA area;
- The EAO's conclusions in Part B section on Marine Mammals, which found low to moderate magnitude residual effects from TMJ-related vessels on SRKWs and significant cumulative effects to SRKWs due to underwater noise; and
- The lower Fraser River is highly industrial and the TMJ site is previously disturbed. The MSA area is a heavily utilized marine environment. These factors increase the seriousness of impact of TMJ.

Geospatial (places, sites, and access):

- Construction and operation are unlikely to cause disruptions to Ts'uubaa-asatx Nation's access to *Tl'uqtinus* Lands identified by Ts'uubaa-asatx Nation in the Fraser River area;
- During construction, access to the TMJ site would be restricted for three years. During operations, Indigenous mariners and fishers would avoid entering and remaining in the marine terminal area due to the warning signs and notifications regarding elevated public risk, in particular when vessels would be berthing, loading, or de-berthing at TMJ;
- The small number of TMJ-related vessels relative to current vessel traffic are predicted to have a negligible to low effect on cultural activities in the MSA area in terms of access from relatively infrequent and short duration transit of vessels to and from TMJ's marine terminal area.

Social, Cultural, Experiential:

- The EAO's conclusions in the Noise assessment in Part B found sensory disturbances from noise are anticipated to be negligible to low magnitude, temporary and short-term, including up to low magnitude noise effects during construction and decommissioning at the village site at *Tl'uqtinus*;
- The EAO's conclusions in the Visual Quality assessment in Part B found a negligible to low impact to the existing visual landscape character in the Fraser River and in the MSA area;
- Potential negligible impacts from TMJ-related vessel traffic during operations affecting visual quality, noise, and vessel wake (with an increasing magnitude of effect the closer one is to the vessels); and
- The cultural importance of SRKW to Ts'uubaa-asatx Nations.

Mitigations:

- Proposed provincial conditions to mitigate impacts to cultural heritage are the development of the Cultural and Archaeological Resources Management Plan for the TMJ site, the Lighting Management, Noise and Vibration Management and Air Quality Management as part of the CEMP and OEMP as well as the Water Quality Management Plan and the Indigenous Cultural Awareness and Recognition Condition;
- *Heritage Conservation Act* (RSBC 1996, c. 182); and
- Proposed mitigations for potential impacts to traditional and cultural interests are the

recommended key mitigations under CEAA 2012 for a Marine Communications, and Vessel Traffic Management Plans, and a Marine Shipping Emergency Response Outreach Program.

D. POTENTIAL IMPACTS ON TITLE

The assessment of impacts to Aboriginal title was informed by the relevant information presented above and below. It is also informed by the EAO's assessment of effects to VCs that informed the discussion of impacts to vegetation, wildlife, fishing, hunting, trapping, and gathering, and other traditional and cultural interests. The Ts'uubaa-asatx Nation raised a concern regarding potential impacts on Aboriginal title due to TMJ did not give adequate consideration of ability of the impacts to impact Ts'uubaa-asatx Nation's right to obtain economic benefit through commercial fishing.

Potential TMJ impacts on Ts'uubaa-asatx Nation title are assessed below, including the following information.

- The EAO's conclusions on Current Use of Lands for Traditional Purposed in Part B of this Report (Section 11.4), that regularly occurring (i.e., an average of one vessel call per day under the BVS) vessel transits with short duration to pass through known fishing areas in the Fraser River and Salish Sea would likely cause negligible to low magnitude effects to access to fishing.
- TJLP has stated that TJLP's influence on TMJ-related vessel operations would be limited beyond TMJ's marine terminal area, but TJLP is committed to adjusting their shipping schedule when safe and feasible to do so in order to reduce the likelihood of TMJ-related vessels interrupting FSC openings in the lower Fraser River through the Marine Access and Transportation Plan.
- The EAO is recommending KMMs under CEAA 2012 for the Marine Access and Transportation Plan and the Marine Communications Plan from Sand Heads out to 12 nm that would be developed in consultation with Schedule B and D Indigenous Groups and include a communication procedure for TJLP to inform Indigenous Groups of vessel schedules and provide a complaint submission process.

14.2.3.1.4 Conclusion

In consideration of the available information, the EAO's consultation with Ts'uubaa-asatx Nation, Ts'uubaa-asatx Nation's engagement with TJLP, TJLP's commitments and the EAO's proposed EAC conditions if an EAC is issued, TMJ is expected to result in a **negligible-to-minor** impact Ts'uubaa-asatx Nation's Aboriginal title.

The key factors that were considered in support of the EAO's conclusion on the impacts to Aboriginal title are summarized as follows:

Use and Occupation:

- The access restrictions to the area surrounding the jetty during construction would be limited in area (to a maximum of area of 23 ha during dredging over 50 days; and then a smaller area for work on the jetty thereafter);
- The EAO assumed that Indigenous mariners and fishers would avoid entering and remaining in the marine terminal area due to the warning signs and notifications regarding elevated public risk, in particular when vessels would be berthing, loading, or de-berthing at TMJ. The increase in vessel traffic along the Fraser River would be a small percentage increase from traffic already present; and
- The increase in vessel traffic along the Fraser River would be a small percentage increase from traffic already present.
- As outlined in the noise and visual quality assessments in Part B, the EAO predicts TMJ would have the potential for short-term duration, negligible to low magnitude residual effects to the Noise and Visual Quality VCs during construction, and frequent (vessel-related) and continuous (jetty site-related) negligible to low effects on visual quality during operations.

Control of Area:

- The area of development for the TMJ jetty is crown land (intertidal submerged).
- Ts'uubaa-asatx First Nation traditionally camped at the former village site across from the TMJ project area gain easier access to seasonal resources, with its camp located behind the areas occupied by other Indigenous Groups.

Economic Benefits:

- TMJ is located on private land already zoned and developed for industrial usage; and
- The construction and operation of the TMJ jetty and the vessel traffic to and from TMJ in the Fraser River is unlikely to affect Ts'uubaa-asatx Nation's overall economic development aspirations for the area now and in the future. However, there may be minor economic impacts to Ts'uubaa-asatx Nation's harvesting of fish.

Mitigations:

- Several conditions are proposed to mitigate impacts to Aboriginal title, including a condition for Indigenous Cultural Awareness and Recognition, Cultural and

Archaeological Resource Management Plan, Indigenous Monitors, Engagement and Reporting, Indigenous Training, Employment and Procurement Plan, Water Quality Management Plan, and Indigenous Monitors. The EAO is also recommending Marine Access and Transportation and Marine Communication Plans as a KMM under CEAA 2012 to reduce impacts to access from construction and operations.

14.3 KWANTLEN FIRST NATION

The EAO respectfully acknowledges that Kwantlen First Nation's (Kwantlen's) assessment included in Part C of this report (in *italics*) was provided in its entirety in Kwantlen's own words to express their perspectives and concerns regarding potential for TMJ residual and cumulative effects to their Aboriginal Interests. The assessment presented below provides a better understanding, directly from Kwantlen, of their community's profile (Section 14.3.1) Kwantlen's concerns related to the EA process (Section 14.3.2), and potential impacts to Kwantlen's fish, wildlife and plant harvesting rights, cultural values and stewardship, and climate change (Section 14.3.3). The EAO greatly appreciates the collaborative information sharing and positive relationship established through working with Kwantlen throughout the EA and Kwantlen's assessment was considered by the EAO through its assessment of TMJ.

14.3.1 COMMUNITY PROFILE[203]

Kwantlen First Nation (ḳʷa:ṅƛəṅ) is a Central Coast Salish community who assert title south into what is now known as Washington State (cut off by USA border). Kwantlen asserts Aboriginal title and rights to the entire Tilbury Island Tilbury Marine Jetty (TMJ) project area. What is now known as modern-day New Westminster and Surrey are of great significance to Kwantlen, with many Elders and community members sharing oral histories on Kwantlen's sacred connection to these lands. Multiple Traditional Land Use Studies have been conducted that verify Kwantlen's long term and multi-generational presence in these areas and describes the temporary and permanent settlements that existed prior to contact.

Kwantlen is a community of 300 members with approximately 100 living on McMillan Island IR6 reserve in Langley, BC. Kwantlen currently has six reserves that span multiple jurisdictions,

[203] The text in italics was written by Kwantlen to highlight Kwantlen's perspectives and concerns about the EA process and does not necessarily reflect the views of the EAO.

including Langley, Maple Ridge, and Mission. Former reserves that were taken under dubious circumstances include lands in Surrey, New Westminster, Maple Ridge, and Glen Valley in Langley. Kwantlen's territory extended down the South Arm of the Fraser as far as a small slough "a few hundred yards above Ladner," which is referred to today as Deas Island Slough to the west of Tilbury Island.

Kwantlen has occupied these lands since time immemorial and countless generations. The 1808 Simon Fraser Expedition provided the occasion for the first direct contact between Kwantlen and white explorers (Kahtahlano 1955; Lab 1960; McKelvie n.d) The accounts of this encounter describe the Kwantlen as dwelling at the village in present day New Westminster, having between 400 and 500 warriors. And exercising dominion over Lulu Island (Neary 2011). In 1824, the Hudson Bay Company dispatched the McMillan Expedition to explore the lower Fraser, and this was the second recorded exploration of Kwantlen Territory by white explorers. The journals of John Work (1912) and Francis Annance (1824-25) provide an account of this expedition; they record meetings with Kwantlen up and down the Fraser River, as far east as Hatzic Slough. Paddling downstream on December 19, 1824, the expedition was met by 4 canoes with 17 Indians of the "Cahoti" (Kwantlen) tribe. That night, the expedition camped in a big village on Lulu Island, this village was most likely the site opposite Tilbury Island. Ancestors of Kwantlen used this area to pick berries, hunt elk and other animals, harvest numerous fish species, and conduct other resource-based land and water activities in and around the village site.

Linguistically, Kwantlen is a həńq̓əmińəm̓-speaking community. Həńq̓əmińəm̓ is the down-river dialect of the Halkomelem language group and is spoken fluently by only a handful of individuals both within and outside of the Kwantlen community; however, there is a cultural resurgence taking place with many members learning to speak the language. Həńq̓əmińəm̓ is used in community Land Code laws, signs on- and off-reserve, in reports, and wherever else the opportunity exists to use it. Həńq̓əmińəm̓ is also a part of the curriculum at Fort Langley Elementary School where it is taught to students of all cultural backgrounds by a Kwantlen language keeper.

Kwantlen is an independent Nation and manages all matters related to governance, consultation, Land Management, community services, and economic development. Kwantlen governance is led by hereditary Chief Marilyn Gabriel and two appointed councilors, Tumia Knott and Les Antone. Chief and Council work closely with both the Kwantlen Lands Advisory Committee (LAC) and the Elders Advisory Committee (EAC) to obtain direction and make decisions on various community initiatives. The LAC was created when Kwantlen voted in a

referendum in 2015 to pass the community's Land Code under the First Nation Land Management Act. This replaces land laws under the Indian Act with Kwantlen's own laws through the community-created Land Code.

Səẏeḿ is the economic development arm of Kwantlen, of which there are five limited partnerships and two non-profits. Səẏeḿ provides services in the areas of contracting (construction, excavation, earthworks, security, and flagging), resource management (archaeology, fisheries, forestry), and on and off reserve development (leləm' Hospitality, šxʷimelə gift boutique, and digital billboards). Kwantlen's Lands Resources and Stewardship, formerly under the Seyem' Qwantlen Business Group, has separated to become its own entity, manages all consultation, accommodation, and on-reserve lands management, including all matters related to the Land Code, permitting, leasing, and cultural heritage and environmental management.

Today, Kwantlen is upholding their important connection to Tilbury Island and surrounding areas by advocating for environmental stewardship practices which take into consideration the cumulative effects of land alienation and rapid development within Kwantlen territory without the consent of the Kwantlen First Nation. With the potential for profound impacts on fish and fish habitat Kwantlen would like to see all necessary steps taken to ensure that Kwantlen First Nation's interests in traditional resources are protected.

14.3.2 KWANTLEN'S CONCERNS WITH THE ENVIRONMENTAL ASSESSMENT PROCESS[204]

Kwantlen has actively participated in the BC Environmental Assessment process for several projects over the past decade including projects such as the Fraser River Tunnel Project, the Pattullo Bridge Replacement Project, and the Hwy 1/Port Mann Bridge project. In the past, Part C has been written by staff of the EAO and Kwantlen provided feedback on the written report. Kwantlen is pleased to advise that in this age of recognition, Kwantlen now has the capacity to author Part C – Impacts to Kwantlen.

In past Projects Kwantlen has expressed that we acknowledge the fact that the Environmental Assessment Process was designed in an era when governments denied the existence of

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Aboriginal Title and Rights. We also acknowledge that the EAO has undergone a revitalization process to incorporate a recognition of Aboriginal Rights and Title, honor the Crown's Constitutional obligation to receive prior and informed consent through meaningful consultation and accommodation.

Kwantlen considers impacts from a holistic worldview; everything is interconnected and an impact in one location will have an effect somewhere else. The impacts to this project are limited to the narrow footprint on Tilbury Island and part of the shipping route out of the Fraser River. This and all projects that go through the EAO process do not consider the entire supply chain that is involved with these projects.

With respect to TMJ, natural gas comes from north eastern BC where the environmental impacts of fracking are serious and widespread. Fracking has been known to cause earth quakes and contributes significantly to climate change by the release (accidental and purposeful) of methane leaks into the atmosphere[205]. In addition, we don't have any certainty that China will switch from coal to LNG; rather, it could be a net increase of greenhouse gasses if there isn't a plan in place to switch from coal.

One of the difficulties in writing an impact report is having to quantify impacts to Rights and Title. The scope of the impacts is difficult to articulate because they are far reaching and more profound than can be put into English terms or numerical data. Another major issue is that Kwantlen, at the end of the day, does not have a say in the decision-making process with the Ministers. We put a significant amount of time into developing an impact report, but what assurance do we have that these impacts to Kwantlen Rights and Title will be fully considered?

We hope that through ongoing dialogue, the principals of reconciliation and recognition, and the new EA Act and the Declaration on the Rights of Indigenous Peoples Act legislation, we will address the issues outlined above. We hope that decision-making with the Ministers can be addressed so we can decolonize the process and ensure that First Nation's voices are heard when these projects are proposed on our Title lands and waters.

[205] Howard R.W. (2019) Ideas and perspectives: is shale gas a major driver of recent increase in global atmospheric methane? Biogeosciences, 16, 3033 – 3046, 2019. https://doi.org/10.5194/bg-16-3033-2019.

14.3.2.1 THE EAO'S PERSPECTIVES AND INPUTS

The EAO's Perspectives on Consultation[206]

The EAO set out its approach to consultation, including an initial assessment of strength of claim and potential impacts on Kwantlen's Aboriginal Interests in a letter to Kwantlen dated June 18, 2015. Based on the Province's initial strength of claim assessment, Kwantlen was consulted at the deeper end of the spectrum as set out in Schedule B of the July 24, 2015 Section 11 Order for TMJ. The EAO is of the view that it has approached consultation with Kwantlen at the deeper end of the spectrum, with the intent to identify potential impacts and consider ways to address potential impacts to any Aboriginal Interests in the project area identified by Kwantlen.

As described in the EAO-led Consultation Activities with Indigenous Groups section of Part C of this Report, the EAO invited Kwantlen to participate in the Working Group. The EAO invited Kwantlen to review and provide comments on the draft Section 11 Order, the draft VC Selection document, the draft AIR, TJLP's Aboriginal Consultation Plan and Reports, the screening of the Application and on the Application and supplemental material, as well as the opportunity to review and comment on several iterations of the EAO's draft decision materials. As part of the Working Group, Kwantlen was invited to participate in technical meetings, teleconferences, and site visits during the Pre-Application and Application Review stages.

At the beginning of Application Review, the EAO met directly with Kwantlen to understand Kwantlen's desired approach to consultation on the EA, and Kwantlen's concerns. The EAO and Kwantlen set up regular teleconferences during Application Review to follow up on action items, provide updates on the TMJ EA process, discuss issues and concerns, and to collaboratively draft proposed conditions. Through a letter to the EAO, including Kwantlen's Round 2 Working Group comments, Kwantlen stated that the location of TMJ is within Kwantlen Traditional Territory in an area where it asserts Aboriginal rights and title. Kwantlen noted that it wanted to attend working group meetings but due to limited capacity and departmental constraints they were not able to. Kwantlen also reported that it wanted to submit comments during the Working Group comment period but have become disheartened with the EAO process and how their concerns are addressed within the spreadsheet format.

During the EA, the EAO sought input from Kwantlen on the nature and scope of their Aboriginal Interests and how they might be impacted by TMJ. Kwantlen wrote their own Part C, including

[206] The text in non-italics was written by the EAO and reflects the views of the EAO and does not necessarily reflect the views of Kwantlen First Nation.

Community Profile and Impact Assessment sections, which was provided to the EAO to be included in this Report to inform the EAO's assessment and for Decision Maker's consideration. The EAO provided feedback on Kwantlen's Part C, which Kwantlen later responded to by providing their revised Part C to the EAO. The EAO undertook efforts to integrate the entirety of Kwantlen's revised Part C into this Report. The EAO worked iteratively with Kwantlen to revise Part C in response to review of TJLP's BVSA Report. The EAO also sought Kwantlen's feedback on the draft Part C, including the EAO's perspectives and inputs related to the consultation process and Kwantlen's Part C Assessment.

The EAO is of the view that it has approached consultation with Kwantlen with the intent to identify potential impacts and consider ways to address potential impacts identified by Kwantlen, which including considering the information provided by Kwantlen in their Part C and over the course of the EA that informed the EAO's conclusions on Impacts to Kwantlen's Aboriginal Interests. While Kwantlen acknowledged that the EAO worked to the best of its abilities to hear Kwantlen's interest and concerns, Kwantlen also identified that it expects that government officials must have the required powers to change projects because consultation without the possibility of accommodation is meaningless. Kwantlen consider that consultation must be more than an opportunity for Indigenous Groups to articulate their concerns.

- In response to requests made by Indigenous Groups, including Kwantlen, and Working Group members, changes were made to the EAO's proposed provincial conditions that would require TJLP to develop a Vegetation and Wetland Management and Wetland Offsetting Plan, Air Quality Management Plan, and GHG Reduction Plan and recommended KMMs under CEAA 2012, including the KMM for a Fish Mitigation to Reduce Harm and Mortality and Fish Habitat Offset Plan, and follow-up programs, Marine Access and Transportation Plan, and a Cultural Heritage Condition.
- The EAO also proposes Condition 9: Indigenous Monitors and recommends a KMM under CEAA 2012 for Indigenous Monitors to determine opportunities for Indigenous Group (Schedule B) participation in the implementation of all required monitoring, including how TJLP would support participation by providing training and equipment.

TJLP began consulting with Kwantlen in 2014 before entering the EA process, through a letter introducing the TMJ. TJLP reports that consultation and information-sharing events have included face-to-face meetings, letters, email exchanges and phone calls. The Application states that funding was provided by TJLP to Kwantlen First Nation for a Traditional Use Study of the TMJ area. Kwantlen prepared the following study regarding their Aboriginal Interests near TMJ on Tilbury Island:

- Kwantlen Land Use and Occupation in the Vicinity of Tilbury Island, February 2016 (Kwantlen First Nation, 2016).

The EAO is aware that funding to support Kwantlen First Nation's review of TJLP's BVSA Report was offered by TJLP. A summary of TJLP's engagement activities with Kwantlen is provided in the Application and in TJLP's Aboriginal Consultation Reports.

At the end of the EA process for TMJ, Kwantlen First Nation provided a separate submission that states the Tilbury Marine Jetty Project is contrary to Kwantlen Law. The EAO included Kwantlen First Nation's separate submission in the referral package for decision makers at time of referral.

Consideration of current context and historical baseline

The EAO respectfully acknowledges Kwantlen's traditional knowledge and worldview provided in Kwantlen's part C assessment in understanding the importance of the Fraser River ecosystem, salmon and other resources within Kwantlen's asserted traditional territory to sustaining Kwantlen's harvesting rights, and cultural and stewardship values. The EAO acknowledges that Kwantlen views that TMJ's project-specific residual effects and cumulative effects should be compared to historical baseline conditions (i.e., prior to contact) instead of current baseline conditions to assess the potential impacts on Kwantlen's Aboriginal Interests. The EAO agrees that consideration of historical and current baseline information and existing impacts is important to understanding the current state of the ecosystem, which must inform the assessment of potential impacts on Aboriginal Interests. For that reason, the EAO has considered this context as relevant and appropriate to include in Part C of this Report for provincial and federal decision makers to consider in their decision (see Section 13.1 of Part C). The EAO also agrees that where cumulative effects of past and present activities affect the conditions that exist today, the conclusion on effects from a current project on that right would be more serious (see Section 12.2 of Part C for more information).

The EAO has summarized the scoping of the assessment and the EAO's consideration of cumulative effects in the context of assessment of impacts on Aboriginal Interests and Treaty Rights in Section 13.1 of Part C and is of the view that the information summarized in that section apply to Kwantlen First Nation's concerns related to the cumulative effects of development in the lower mainland. The EAO is recommending a KMM under CEAA 2012, requiring TJLP to participate in regional environmental management initiatives where feasible, including cumulative effects monitoring related to marine shipping impacts to SRKW, current use of lands, waters, and resources for traditional purposes, and air quality in the Salish Sea or Lower Fraser at the request of relevant authorities. The EAO is of the view that the recommended KMMs under CEAA 2012 and the proposed EA conditions would help to address

and reduce the potential residual effects and cumulative effects to VCs and the potential impacts to Kwantlen's Aboriginal Interests.

Geographic Scope of Assessment and Impacts to Climate Change

The EAO understands that Kwantlen's assessment of potential impacts of TMJ on their Aboriginal Interests has considered a broader geographic scope in their assessment of cumulative effects, including upstream oil and gas activities in northeast BC, natural gas hydraulic fracturing (i.e., fracked gas), natural gas pipelines, other natural resource development projects, and other elements along the LNG supply chain connected to the TMJ Project and the proposed Tilbury Phase 2 LNG Expansion Project. The EAO is also aware that Kwantlen First Nation identified concerns about the frequency and number of bunker vessels under the BVS, including concerns regarding further expansion of the Project and upstream effects from LNG production. The EAO understands that TJLP has met with Kwantlen First Nation to continue the dialogue with regards to upstream effects of LNG production. The EAO has reflected Kwantlen First Nation's perspectives on climate change and impacts from upstream natural gas extraction activities in Section 13.2.3 of Part C. The issue of direct GHG emissions from TMJ, and upstream GHG emissions – in addition to mitigations for direct emissions from TMJ – are addressed in the GHG chapter in Section 5.2 of Part B of this Report.

- The EAO is proposing a Condition 19: Air Quality Management Plan, and Condition 20: GHG Reduction Plan, and recommending KMM under CEAA 2012 for an Air Quality Management Plan, which would require measures for TJLP to reduce adverse effects from emissions during construction and operations, including development of triggers that would cause TJLP to take corrective action to reduce GHG and air quality parameters, and describe how TMJ would achieve any municipal, provincial, national or international government GHG regulations or objectives that are made mandatory for TMJ. The Air Quality Management and GHG Reduction Plans would also require TJLP to determine how TMJ would achieve any GHG regulations or objective that are made mandatory by a municipal, provincial, national, or international government with jurisdiction. The EAO is of the perspective that upstream GHG emissions would be outside the scope of the EA and that the issue has been adequately resolved for the purposes of the EA.
- The EAO understands that the increase identified in TJLP's BVSA Report is only in the number and frequency of vessel calls, and that TJLP indicated that the BVS does not contemplate a further expansion of the project or more LNG production compared with the application scenario. In response to the BVS, the EAO is also recommending a KMM

under CEAA 2012 for the Marine Access and Transportation Plan, which specifies that, in each calendar year, the TMJ will receive a maximum of 365 LNG vessel calls, of which a maximum of 68 will be LNG carrier calls.

In consideration of the available information the EAO is of the view that the concerns raised by Kwantlen regarding potential TMJ related impacts to climate change and upstream natural gas extraction activities have been adequately identified and considered for the purposes of the EA.

The EAO's Inputs and Perspectives Regarding Kwantlen First Nation's Part C Assessment[207]

The EAO would like to thank Kwantlen for sharing their traditional knowledge and providing their assessment of potential impacts of TMJ on Kwantlen's Aboriginal Interests included in Kwantlen's Part C. The EAO understands that Kwantlen has significant concerns regarding the current state of the ecosystem, including declines in Fraser River salmon populations, industrialization of Tilbury Island and the lower Fraser River, existing impacts to fish and fish habitat, water quality, birds and wildlife, wildlife habitat, resident orcas (Southern Resident Killer Whales), vegetation, climate change effects from global GHG emissions, and other cumulative impacts which have resulted in existing impacts on Kwantlen's Aboriginal Interests. The following provides the EAO's perspectives and inputs for Kwantlen's Part C Assessment of Potential Impacts to Kwantlen's Aboriginal Interests.

Potential Impacts on Fishing: The EAO evaluated the potential effects on fishing rights attributable to TMJ which are summarized in Section 13.3.1 and is satisfied that the key impacts to biophysical components resulting in changes to fish quantity and quality, changes in access to fishing resources, and changes to social, cultural, and spiritual values associated with traditional fishing activities summarized in that section apply to Kwantlen First Nation. The EAO is also satisfied that, with respect to the BVS any potential changes to relevant pathways of effect on the biophysical, geospatial, and other social, cultural, experiential sub-components of Aboriginal fishing rights summarized in Section 13.3.1.2 apply to Kwantlen First Nation. In the Current Use of Lands and Resources for Traditional Purposes and Cultural Heritage section of Part B (Section 11.4), the EAO found it is reasonable to expect that past effects would combine with effects from TMJ-related marine shipping to result in significant cumulative effects to current use for fishing and other cultural use of marine areas, should Kwantlen First Nation fish

[207] The text in non-italics was written by the EAO and reflects the views of the EAO and does not necessarily reflect the views of Kwantlen First Nation.

or preferentially use or rely on sites located at TMJ or within and adjacent to shipping lanes in the Lower Fraser and Salish Sea. The EAO understands that Kwantlen currently does not have access to fish at the TMJ site location due to their FSC licenses issued by DFO, which restrict Kwantlen's ability to fish for FSC purposes to a specific area on the Fraser River. The EAO also understands that Kwantlen historically fished the lower Fraser River near Tilbury Island, Lulu Island, and other areas near the TMJ site and that, as reported in "Kwantlen Traditional Land Use and Occupation in the Vicinity of Tilbury Island", Kwantlen had a fishing village on Lulu Island across from Tilbury Island prior to first contact. Kwantlen noted that with few opportunities to pass down traditional knowledge through experience on the river, this impacts Kwantlen's identity and rights. The EAO understands that Kwantlen has expressed interests in re-establishing fishing in this area in the future along with other areas within their asserted traditional territory.

The EAO predicts that TMJ alone would have a **minor** impact to Kwantlen's right to fish. However, in consideration of available information, including Kwantlen's Part C impacts assessment, the EAO's consultation with Kwantlen, Kwantlen's engagement with TJLP, TJLP's commitments, the EAO's proposed EAC conditions if an EAC is issued and the recommended KMMs under CEAA 2012, the EAO concludes that TMJ combined with cumulative effects is expected to result in a **minor-to-moderate** impact on Kwantlen's right to fish. The EAO predicts that TMJ would interact with current baseline levels of cumulative effects that already have a combined negative impact to Kwantlen's availability of resources, access to fishing areas, and the experience of fishing in the lower Fraser River. The cumulative effects are compounded by the importance of the Lower Fraser to Kwantlen and the importance of fish harvesting to Kwantlen's cultural and traditional interests and that TMJ-related vessels would operate in a relatively confined and heavily utilized marine environment, which increase the seriousness of impact of on Kwantlen's right to fish.

The EAO considered Kwantlen's perspectives on cumulative effects and Kwantlen's concerns about the current status of salmon populations and current conditions that have impacted Kwantlen's ability to access the resources and practice fishing rights within the Fraser and the risk that ongoing development furthers this impact on Kwantlen. The EAO acknowledges that there are already vessels transiting the lower Fraser River which can impact Indigenous fishers' access to and quality of experience of fishing. While the EAO recognizes there is some uncertainty when considering how cumulative effects impact Aboriginal Interests, the EAO agrees with Kwantlen, that any increase in vessel traffic at the lower Fraser River would potentially be more serious when combined with past, present, and reasonably foreseeable activities. The EAO also considers that there is potential for higher frequency of interactions to

occur with the BVS between TMJ-related vessels and Indigenous Groups engaging in vessel-based FSC fishing in the lower Fraser River during FSC fishing windows and that this effect would apply to Kwantlen First Nation should members engage in vessel based FSC fishing activities in the lower Fraser River in the future.

The EAO understands that Kwantlen expects to see efforts to restore habitat both at the project site and through offsetting and expressed interest in having the opportunity to lead the habitat restoration project and effectiveness monitoring and be involved in the development of the offset plans as early as possible. Kwantlen commented that effectiveness monitoring of Fish Habitat Mitigation should be considered for more than five years with respect to the fish habitat offset plan. Kwantlen commented that construction must occur using measures with least impact to fish include methods and timing of construction.

- The EAO is proposing mitigations measures for TMJ's potential impacts to Kwantlen's right to fish, including mitigations to reduce impacts to noise and visual quality in the CEMP and OEMP as well as the recommended key mitigations under CEAA 2012, specifically the Fish and Fish Mitigations to Reduce Harm and Mortality and Fish Habitat Offset Plan, and a follow-up program for effectiveness of fish and fish habitat mitigations. The EAO is also recommending as KMMs under CEAA 2012 for a Marine Communications Plan, a Marine Access and Transportation Plan and a Vessel Traffic Management Plan. These plans would identify the procedures of communication to Indigenous Groups and identification of mitigations to reduce potential disruptions for Indigenous harvesters and mariners to carry out traditional use activities including fishing for FSC purposes.

The EAO understands that TJLP and Kwantlen have met to discuss Kwantlen's interest in habitat restoration and stewardship initiatives. Kwantlen has expressed a desire to continue dialogue with TJLP to mitigate risks to the environment wherever possible if the project is approved and begin discussions about an Impact Benefit Agreement. Kwantlen expressed that TJLP should consider how, long term, it can make a beneficial impact to improve relations with local First Nations and benefit the environment and ecosystem. Kwantlen suggested examples such as funding local First Nation's artists, creating access for traditional practices at Tilbury Island, or offering opportunities / benefits to Nations including habitat and or restoration improvements to nearby fisheries resources that they can co-lead and manage.

- The EAO is proposing a variety of conditions that may create opportunities for Indigenous Groups, including Indigenous monitors, engagement and reporting, training, employment, and procurement. For example, Condition 17: Indigenous Cultural Awareness, Recognition and Mitigation would require TJLP to offer opportunities to Indigenous Groups on Schedule B in the Lower Fraser to lead or support activities such

as ceremonies, executing cultural protocols, transmission of knowledge or language, recognizing cultural heritage and providing cultural awareness training to TMJ employees.

- The EAO is aware that TJLP has committed to contribute up to $2 million to the FNFLF , which is a program led by several Indigenous Groups that support recovery programs for chinook salmon, eulachon and sturgeon in the Fraser River and Salish Sea. Kwantlen First Nation identified that it does not feel that the proposed contribution reflects well to the scale, tenure, or potential impacts of TMJ. Kwantlen First Nation also suggest that an offset measure should be either: 1) Tied to Project Revenue, or 2) Contributions should be made for the life of the project, since impacts are felt cumulatively and during the entire life cycle of the project. To this end, Kwantlen First Nation suggest that a $2 million contribution by TJLP every 5 years for the duration of the jetty would be more appropriate.
    - For more information about the EAO's consideration of TJLP's contribution proposal, including the views of Kwantlen First Nation, see Section 13.1 on Current Context and Cumulative Effects in Part C.

Potential Impacts on Hunting, Trapping and Plant Gathering: The EAO evaluated the potential effects of TMJ on hunting, trapping, and gathering in Section 13.3.2 of Part C, and is satisfied that the key impacts to hunting, trapping, and gathering activities summarized in that section apply to Kwantlen First Nation. The EAO concludes that, in consideration of the available information, including Kwantlen's Part C impacts assessment, the EAO's consultation with Kwantlen, Kwantlen's engagement with TJLP, TJLP's commitments, the EAO's proposed EAC conditions if an EAC is issued and the recommended KMMs under CEAA 2012, TMJ is expected to result in a **negligible** impact on Kwantlen's right to hunt, trap and gather.

The EAO understands Kwantlen has concern regarding the potential cumulative effects of all the projects taking place in the lower Fraser River on both the environment and Aboriginal Interests. Kwantlen noted that industrialization on the Fraser River and in the TMJ area has resulted in a lack of habitat for birds, fish and other wildlife within the area which has had a significant experiential impact for Kwantlen. As described in the EAO's Impact Assessment Methods for Part C (Section 12.2), the assessment of seriousness of impacts on Aboriginal Interests is primarily focused on factors related to direct impacts from the project (i.e., impacts to biophysical factors from the project, Indigenous use of the site); however, the assessment also considers the historical context or current state of affairs in the broader regional area in relation to an Indigenous Group's use of this portion of its territory (i.e., relative importance of the site).

Kwantlen noted that ancestors and current members of Kwantlen used to hunt, trap, and gather plant resources throughout Kwantlen territory including the areas in and around Tilbury Island. The EAO considers that TMJ is unlikely to materially affect the experience of hunting, trapping, and gathering at the TMJ site because the site provides very limited existing opportunity for these activities within the geographic scale that is being assessed. The EAO acknowledges Kwantlen's concerns regarding currently high levels of access restriction to nearby hunting areas and impacts to native plant and wildlife species, which is creating difficulties to bring food home to Kwantlen's community members. Kwantlen has noted they do not currently harvest at the TMJ site but seek to re-establish harvesting practices throughout their entire asserted traditional territory.

In Kwantlen's impact assessment, Kwantlen proposes creating small pockets to support and encourage biodiversity, including native species that support wildlife or migratory birds as a mitigation in addition to the proposed provincial and federal mitigation measures.

- The EAO is proposing mitigation measures to reduce impacts to Kwantlen's right to hunt, trap and gather include the vegetation and wetland management, wildlife and wildlife habitat management, light management, and noise management components of the CEMP and OEMP, all of which would require consultation with Indigenous Groups. The EAO is also proposing a condition for a Vegetation and Wetland Management and Wetland Offsetting Plan, as well as a KMM under CEAA 2012 requiring a Wetland Compensation Plan to offset residual effects to vegetation and wetland. Should TMJ be approved, these measures will ensure that the wetland compensation habitat area is larger than the area being compensated, and require TJLP to consider habitat needs for migratory birds and listed species, as well as undertake follow-up monitoring to ensure the compensation habitat area exceeds current levels of function based on performance standards.

Potential Impacts on Other Traditional and Cultural Interests: The EAO evaluated the potential effects of TMJ on impacts to other cultural and traditional interests in Section 13.3.3 of Part C and is satisfied that the key impacts to other cultural and traditional interests summarized in that section apply to Kwantlen First Nation. In the Current Use of Lands and Resources for Traditional Purposes and Cultural Heritage section of Part B (Section 11.4), the EAO found it is reasonable to expect that past effects would combine with effects from TMJ-related marine shipping to result in significant cumulative effects to cultural heritage, including Indigenous Groups that use Southern Resident Killer Whales for cultural purposes. The EAO concludes that, in consideration of the available information, including Kwantlen's assessment in Part C, consultation with Kwantlen, Kwantlen's engagement with TJLP, TJLP's commitments, the EAO's proposed EAC conditions if an EAC is issued and the recommended KMMs under

CEAA 2012, the EAO is of the view that the concerns raised regarding potential TMJ related impacts to Kwantlen's other cultural and traditional interests have been adequately considered and addressed for the purposes of the EA.

The EAO considered Kwantlen's perspectives on cumulative effects and Kwantlen's concerns about the current state of Tilbury Island, and that the area can no longer be used by Kwantlen to exercise their Aboriginal Interests in Kwantlen's preferred manner. The EAO's consideration of current context and cumulative effects as relevant to decision makers is provided in Section 13.1 of Part C. While the EAO recognizes there is some uncertainty when considering how cumulative effects impact Aboriginal Interests, the EAO agrees with Kwantlen that TMJ's potential impacts at Tilbury Island would potentially be more serious when combined with past, present, and reasonably foreseeable activities.

The EAO understands that Kwantlen First Nation views industrialization of the Fraser River, including the project area and Tilbury Island, as having had an impact to Kwantlen's ability to use and occupy portions of its traditional territory for traditional subsistence, cultural, ceremonial, and economic activities. The EAO understands that directly across from Tilbury Island on the south side of Lulu Island is a village site the Kwantlen First Nation indicated was used by Kwantlen peoples along with other Indigenous Groups, and Kwantlen has concerns regarding potential impacts to archaeology sites and cultural heritage resources. Kwantlen has requested for a cultural monitor to be on site during ground disturbance works in the project site. The EAO is of the view that the recommended KMMs under CEAA 2012 and the proposed EA conditions would help to address and reduce the potential impacts to archaeology sites and cultural heritage resources.

- The EAO has proposed provincial conditions to mitigate impacts to cultural heritage including the development of the Cultural and Archaeological Resources Management Plan for the TMJ site, the Lighting Management, Noise and Vibration Management and Air Quality Management as part of the CEMP and OEMP as well as the Water Quality Management Plan, Air Quality Management and GHG Reduction Plans, and the Indigenous Cultural Awareness and Recognition Condition all which must be developed in consultation with Indigenous Groups. The EAO notes that the HCA, (RSBC 1996, c. 182) also applies to TMJ.

The EAO acknowledges that Kwantlen's cultural and stewardship values associated with the Fraser River and requests for a more holistic cumulative effects assessments to consider each project in the lower Fraser to better understand why many species are endangered, including

the Southern Resident Killer Whale, and what can be done to improve river conditions. The EAO acknowledges Kwantlen's concern regarding impacts to Southern Resident Killer Whale with increased shipping and that Kwantlen holds Southern Resident Killer Whale in high esteem because of cultural and spiritual connections to this species, which are rooted in Kwantlen's worldview and perspective that all living things are interconnected.

- The proposed KMMs under CEAA 2012 include a marine mammal management plan and vessel traffic management plan to reduce impacts to marine mammals, including Southern Resident Killer Whale, from construction and operations, including marine shipping. With regards to Southern Resident Killer Whale specifically, the EAO also notes several regional initiatives and measures have been implemented by the Government of Canada to better understand and manage cumulative effects on the recovery of Southern Resident Killer Whales (listed in Section 13.1.1 of Part C).

Potential Impacts to Title: The EAO acknowledges Kwantlen's view that Kwantlen's Aboriginal Rights and Title could be impacted by TMJ. With regards to use and occupation of the TMJ area, access restrictions to the area surrounding the jetty during TMJ construction would be limited in area (to a maximum of area of 23 ha during dredging over 50 days and then a smaller area for work on the jetty thereafter). The EAO assumes that Indigenous mariners and fishers would avoid entering and remaining in the marine terminal area due to the warning signs and notifications regarding elevated public risk, in particular when vessels would be berthing, loading, or de-berthing at TMJ. TMJ will result in a small percentage increase in vessel traffic along the Fraser River. At the scale of the LAA and RAA this would amount to a low magnitude impact to access from impacts at the TMJ site.

The area of development for the TMJ jetty is crown land (submerged) with the upland portion of TMJ is located on fee simple private land that are used for industrial purposes. The EAO understands that Kwantlen considers that impacts from construction and operation of the TMJ jetty and the vessel traffic to and from TMJ in the Fraser River may have adverse effects on socio-economic and cultural conditions and spiritual health and wellbeing through potential effects on VCs (e.g., water quality, underwater noise, and sediment disturbances) that may affect Kwantlen's fisheries.

- The EAO is proposing mitigations measures for TMJ's potential effects to VCs, including fish and fish habitat, such as mitigations to reduce impacts to noise and visual quality in the CEMP and OEMP as well as the recommended key mitigations under CEAA 2012, specifically the Fish and Fish Mitigations to Reduce Harm and Mortality and Fish Habitat Offset Plan, and a follow-up program.

The EAO acknowledges Kwantlen's concerns regarding potential impacts of TMJ-related construction on archaeological sites and physical and cultural heritage. Based on available

historical evidence, Kwantlen First Nation did not have exclusive use and occupation of Tilbury Island in 1846 (i.e., assertion of Crown sovereignty, relevant for assessing Aboriginal title claims), or at the time of first contact in 1808.

- The EAO has proposed several conditions to mitigate impacts to Aboriginal title, including an Indigenous Cultural Awareness and Recognition Condition, Cultural and Archaeological Resource Management Plan (which includes the requirement for TJLP to obtain HCA permits and conduct an AIA prior to construction), Indigenous Monitors, Engagement and Reporting, and an Indigenous Training, Employment and Procurement Plan. The EAO is also recommending a Marine Communications, Marine Access and Transportation Plan and Vessel Traffic Management plan as KMMs under CEAA 2012 to reduce potential impacts to access from construction and operations.

In consideration of the available information, the EAO's consultation with Kwantlen First Nation, TJLP's engagement with Kwantlen First Nation, TJLP's commitments, the EAO's proposed EAC conditions if an EAC is issued and the recommended KMMs under CEAA 2012, the EAO is of the view that impacts to Aboriginal title have been adequately considered and addressed for the purposes of the EA.

The following sections in *italics* were written by Kwantlen and focuses on Kwantlen's assessment of potential impacts of TMJ to Kwantlen's Aboriginal Interests.

14.3.3 POTENTIAL IMPACTS TO ABORIGINAL INTERESTS KWANTLEN'S CONCERNS WITH THE ENVIRONMENTAL ASSESSMENT PROCESS[208]

Kwantlen considered the information provided during the EA process (in meetings, letters and Working Group Meetings), in the following assessments of the potential impacts of TMJ on Kwantlen First nation's Aboriginal interests.

The following sections focus on potential impacts of TMJ to Kwantlen First Nation's Aboriginal right to fish, hunt, trap and gather, mitigations and accommodations to address potential impacts, as well as the Kwantlen's conclusions on the impacts to Aboriginal Interests.

A. KEY ISSUES

Kwantlen First Nation's key concerns in relation to TMJ and Kwantlen First Nation's Aboriginal Interests:

[208] The text in italics was written by Kwantlen to highlight Kwantlen's perspectives and concerns about the EA process and does not necessarily reflect the views of the EAO.

- *Concern regarding the potential cumulative effects of all the projects taking place in the lower Fraser River on both the environment and Aboriginal Interests;*
- *Concern that potential effects on water quality such as noise, vibration, loose sediments, and other deleterious effects that may affect fisheries (particularly salmon, eulachon, and sturgeon) which could have an adverse effect on socio-economic and cultural conditions and spiritual health and wellbeing;*
- *Concern regarding the effect increased shipping may have on critically endangered Southern Resident Killer Whales and other aquatic species;*
- *Concern regarding the impact of LNG on climate change; and*
- *Concern regarding TMJ's potential impacts on Kwantlen First Nation's Interests and the cultural heritage, archeological sites, and riverine resources in the area.*

In a letter to the EAO (dated June 28, 2019), Kwantlen identified key concerns in relation to TMJ and Kwantlen's Aboriginal Interests, which the EAO has summarized below:

- TMJ is located within Kwantlen Traditional Territory in an area where Kwantlen asserts Aboriginal rights and title;
- TMJ has the high likelihood of impacting Kwantlen's rights and title, especially with respect to the cumulative environmental effects from TMJ, plus existing and future projects in the area;
- Tilbury Island is over-industrialized. Baseline information used to assess residual effects do not take into account pre-contact conditions of the island, which is a major flaw in assessing the potential effects of TMJ;
- Concern about existing cumulative effects of industrialization and the lack of habitat available for birds, fish, and other wildlife within the Fraser River estuary;
- Concerns about the current status of salmon populations and Kwantlen's ability to access the resources and practice fishing rights within the Fraser. Kwantlen identified concerns that the current conditions have negatively affected their rights, and ongoing development furthers this impact on Kwantlen;
- There is immense pressure on the Fraser River. Kwantlen requests a cumulative effects assessment that will take into account each project along the lower Fraser River to better understand why so many species are endangered, and what we can do to improve the river conditions;
- Concern that TMJ would contribute to GHGs and climate change, which is in opposition to Provincial and Federal initiatives to reduce GHGs;
- Concern that TMJ would affect Kwantlen's rights and title through reduced salmon stocks in the Fraser River; salmon is a cultural cornerstone species for Kwantlen, and their dwindling stocks have greatly impacted the community;

- Due to the current land tenure holders on Tilbury Island, Kwantlen is unable to access the land, of which Kwantlen asserts title;
- Concern that increased shipping would harm the resident Orca (Southern Resident Killer Whales) population; and
- Concern about impacts to cultural heritage and archaeology sites.

B. POTENTIAL IMPACTS ON FISHING

Kwantlen members continue to harvest salmon (for food, social and ceremonial [FSC] purposes) for an approximately 42 km stretch of the Fraser River, starting from about 6 km upstream of the Pattullo Bridge up towards Mission. In this area, there were 36 communal FSC licenses, 7 communal FSC licenses with limited participation, and 23 communal FSC licenses with allowance for sale that were issued to Kwantlen members in 2014. These licenses were issued for chinook, sockeye, chum, and eulachon, with the use of drift net, set net, dip net or beach seine. Kwantlen's Right to fish is heavily regulated and restricted by DFO.

Kwantlen First Nation raised the following key concerns regarding potential impacts on the right to fish due to TMJ:

- *Concern regarding the current status of salmon populations and Kwantlen's ability to access the resources and practice fishing rights within the Fraser. Salmon is a cultural cornerstone species for Kwantlen and the reduction in stocks is greatly impacting the community's wellbeing from a cumulative effect's standpoint;*
- *Fish are significant part of the food-web and overall biome of the lower mainland, Fraser Valley, and beyond. Harm to fish from project construction to operations and shipping contributes to the ongoing biodiversity crash/extinction event that is taking place, which is exacerbated by the climate crisis;*
- *Concern regarding the current conditions of the Fraser River and how this has negatively affected Kwantlen's rights with respect to over-industrialization and sprawling development;*
- *Concern that the project would affect Kwantlen's rights and title through further impacts to salmon stocks in the Fraser River and access to Tilbury Island. We came to this conclusion by looking at the Fraser River as a whole, and strongly believe this project contributes to "death by a thousand cuts," whereby salmon stocks have plummeted and harmed the Kwantlen community as a result; and*
- *Concern that potential effects on water quality, including underwater noise and sediment disturbance that may affect fisheries, which would have an adverse effect on socio-economic and cultural conditions and spiritual health and wellbeing.*

Potential Impacts to Fish and Fish Habitat

Kwantlen is a community that relies on salmon, eulachon, and other species that historically have been abundant in the Fraser River and local tributaries. We have extreme concerns about the loss of any habitat on the Fraser River given the state of biodiversity loss, climate change, and the ever-declining abundance of Fraser River salmon. With several flora and fauna on the Species at Risk Act, and several more listed as 'Endangered', Kwantlen is frustrated by the continued expansion of fossil fuel industries that destroy habitat not only along the Fraser River, but along the entire supply chain including northeastern BC where the gas is fracked.

If this project is approved, we expect to see significant efforts to restore habitat both on the project location and through offsetting measures. Kwantlen would also like to have the opportunity to lead the habitat restoration project, and effectiveness monitoring.

Potential Impacts to Access and Use of the Area for Fishing

Specific sites of traditional importance associated with fishing rights near TMJ were identified by Kwantlen. Kwantlen reported that the Fraser River and Brunette River were critical locations for fishing, and that salmon, eulachon, and sturgeon were the key species harvested. The Fraser River was identified as a significant feature in Kwantlen culture and continues to be extremely important (Kwantlen TLUS). It provided fish, as well as other resources to ancestors and was used as a canoe route to travel and engage in widespread trade networks (Kwantlen TLUS). Additionally, archaeological site DgRs-017, located on the riverbank directly opposite to TMJ, was identified by Kwantlen as an important fishing and habitation site, boat landing site and place of spiritual and cultural value. Kwantlen also identified a portion of the south arm of the Fraser River across from Lulu Island as being within the Kwantlen territory and was used extensively for fishing by their ancestors. Kwantlen understands that the Project area is not currently used for the exercise of Kwantlen's fishing right but that they aspire to use the entire extent of their asserted territory to do so in the future.

Potential Impacts to the Social, Cultural, and Experiential Aspects of Fishing

Kwantlen's constitutional rights to harvest salmon has been devastated by many factors over the past several decades. A fishing season typically allows for less than 5 openings a year and many species are restricted to a zero retention catch policy. Members of Kwantlen are unable to depend on the fish resources for sustenance, Cultural or Experiential aspects and the intergenerational transfer of traditional Knowledge. Kwantlen has challenges supplying enough Salmon for their annual First Salmon Ceremony, an ancient ceremony practiced since time immemorial. With so few fishing opportunities to pass down traditional knowledge

through experience on the river, this has a direct, significant impact to Kwantlen's identity and rights.

Potential Impacts related to the review of TJLP's BVSA Report

Kwantlen identify that future impacts and interests need to be considered under TJLP's BVSA. The additional vessels from the BVS will negatively impact Kwantlen's ability to restore fishing rights to this area. Kwantlen has concerns with the potential gradual increases to the frequency of vessels under the BVS. The increased traffic would further disenfranchise Kwantlen from restoring access to fishing in their traditional fishing grounds.

Kwantlen's Impact Conclusion

In consideration of the available information, consultation with Kwantlen First Nation, Kwantlen First Nation's engagement with TJLP, TJLP's commitments and the EAO's proposed EAC conditions if an EAC is issued, TMJ is expected to result in cumulative impacts on Kwantlen's right to fish. Kwantlen appreciates all the draft conditions but is still concerned with expansion of the fossil fuel export while in the midst of a climate and biodiversity crisis.

Kwantlen openly and publicly declare and affirms that we hold aboriginal title to our land, and aboriginal rights to exercise use of our land, the sea and fresh water, and all their resources within that territory occupied and used by our ancestors. Since time immemorial Kwantlen governance and laws have managed these lands in a sustainable manner and finds it is very difficult to navigate within a process that does not align with traditional values rooted in holistic and generational land management.

The over industrialization of the Fraser River amounts to little more than another form of cultural genocide. The accelerated loss of salmon stocks within the Fraser River has a direct impact on the inter-generational transfer of traditional knowledge. Government officials must have the required powers to change projects because consultation without the possibility of accommodation is meaningless. Consultation must be more than a opportunity for First Nations to articulate their concerns.

The key factors that were considered in support of that conclusion are the key factors and mitigations identified above for impact to fish, access and use, cultural and experiential effects, cross-cutting mitigations, and the following:

Biophysical:

- *The biophysical impacts of the project will impact the return of salmon, eulachon, and other important species at the project site, which will have far reaching impacts up and*

down the river. The decline of fisheries from loss of habitat, vessels related to TMJ, and fossil fuel expansion and export, will impact the rights of Kwantlen to access fish for FSC purposes from a cumulative effect's standpoint. Kwantlen comes to these conclusions by considering not just the project footprint, but the entire supply chain which starts in northeast BC and considers the duration of the project.

Site Use and Access:

- *Currently, Kwantlen does not have access to fish at the site location due to what Kwantlen views as colonial-style DFO mandates; however, Kwantlen historically fished immediately adjacent to this area in both pre-contact and post-colonial times around the qeyqeyt village site until the adjacent land was sold under what Kwantlen considers to be dubious circumstances by the federal government. Kwantlen stresses that any industrial/commercial activity that takes place downstream from Kwantlen has impacts to the Nation upriver – the watershed is a holistic and interconnected system.*

Cultural and Experiential:

- *Kwantlen's ability to harvest Fish resources for Cultural and Ceremonial purposes is already in jeopardy. The openings for salmon are so few that Kwantlen members cannot practice their rights to fish enough food for the year, which has major economic, social, and cultural impacts to the Nation (individually and as a whole). Any impacts to Fish or Fish Habitat are considered a high priority to Kwantlen*

Mitigations:

- *The cumulative effects on the Fraser River need to be studied in a fulsome way that considers existing and proposed projects and looks at historic baselines to determine the actual impact of the project. Merely looking at the current state of Tilbury Island is a false read of the devastation that happened to the original habitat of the island;*
- *Kwantlen appreciates the list of key mitigation measures from EAO and considers them mostly adequate for the specific footprint of the project; however, as stated above, the entire supply chain should be considered to get a sense of the true and wide-reaching impacts of the project, and historic baselines should be used to understand the true residual effects;*
- *Effectiveness Monitoring of Fish Habitat Mitigation should be considered for more than 5 years with respect to the fish habitat offset plan; and*
- *Construction must occur using measures with least impact to fish including the methods and timing of construction.*

TJLP's corporate culture should consider the positive and significant impact of legacy benefits to local First Nations impacted by this project, including habitat and/or restoration improvements to nearby fisheries resources that they can lead or co-manage. This should be thinking beyond what is required compensation, but how long term can they make a true and beneficial impact to improve relations with local First Nations and benefit the local environment and ecosystem. Some other examples of this are funding local First Nation's artists, creating access for traditional practices to Tilbury Island for First Nation's use, and funding long-term legacy projects over the course of the project's lifetime.

C. IMPACTS ON HUNTING, TRAPPING, AND PLANT GATHERING

Kwantlen First Nation raised the following concerns regarding potential impacts on the right to hunt and trap due to TMJ: Kwantlen used to hunt, trap, and gather plant resources throughout Kwantlen territory, including the areas in and around Tilbury Island. These activities took place throughout the Lower Mainland and Fraser Valley and were a main source of sustenance for ancestors and current members of Kwantlen. Unfortunately, the abundance of birds and game that used to exist in abundance locally have been wiped out due to rapid urban expansion that eliminated this practice.

Kwantlen members now must travel great distances to practice their right to hunt, which has greatly affected the ability for Kwantlen to easily bring food home for family and community. Though the TMJ project's footprint is a small area in the grand scheme, Kwantlen views TMJ as part of "death by a thousand cuts" with respect to habitat and biodiversity loss, which has nearly eliminated Kwantlen's Section 35 Rights to hunt in the traditional territory.

Potential Impacts to Wildlife and Wildlife Habitat

The current state of Tilbury Island, primarily industrial development, inhibits wildlife from living or migrating on the land. In previous generations, Tilbury Island was a place of rich biodiversity that supported all manner of wildlife and native plants. Tilbury Island has been overdeveloped with no space left for biodiversity to thrive.

Potential Impacts to Access and Use of the Area for Hunting and Trapping

Because of the over-industrialization of Tilbury Island, there is no ability for hunting and trapping on the island. In previous generations, this area would have been used extensively for hunting and trapping.

Potential Impacts to the Social, Cultural, and Experiential Aspects of Hunting and Trapping

The over-industrialization of Tilbury Island has impacted the social cultural and experiential aspects of hunting and trapping because these vital practices can no longer be done there due to the current physical environment and lack of access to Tilbury Island. The impacts to culture and Section 35 Rights are significant and immeasurable in scope.

Kwantlen's Conclusion

In consideration of the available information, consultation with Kwantlen First Nation, Kwantlen First Nation's engagement with TJLP, TJLP's commitments and the EAO's proposed EAC conditions if an EAC is issued, TMJ is expected to result in significant impacts on Kwantlen First Nation's right to hunt and trap.

The key factors that were considered in support of that conclusion are the key factors and mitigations identified above for impacts to fish, access and use, cultural and experiential effects, cross-cutting mitigations, and the following:

Biophysical:

- *The biophysical impacts of the project in the EA process only identify impacts based on the extensive industrialization of Tilbury Island. The native plant species and wildlife have already been impacted beyond recognition.*

Site Use and Access:

- *As the entirety of Tilbury Island is industrial/brown field, there is no access for band members to practice their Section 35 Rights.*

Cultural and Experiential:

- *The over-industrialization of Tilbury Island has removed access, destroyed habitat, biodiversity, and eliminated all prospects of exercising Section 35 Rights. The experiential impact is significant due to the reasons listed above.*

Mitigations:

- *During the EA, Kwantlen continued to review and make suggestions on the draft provincial and federal conditions. Outside of those conditions we propose the following mitigation measures:*
  - *Creating small pockets to support and encourage biodiversity, including native species that support wildlife or migratory birds.*
  - *TJLP's corporate culture should consider the positive and significant impact of legacy benefits to local First Nations impacted by this project, including habitat and/or*

restoration improvements to promote biodiversity that they can lead or co-manage. Other examples include are funding local First Nation's artists, creating access to Tilbury Island for First Nation's use, and funding long-term legacy projects over the course of the project's lifetime.

D. IMPACTS ON OTHER TRADITIONAL AND CULTURAL INTERESTS

Kwantlen First Nation raised the following concerns regarding potential impacts on other traditional and cultural interests due to TMJ:

- *Potential damage to archaeology sites and cultural heritage resources; and*
- *Restricted from accessing the site for cultural uses*

Potential Impacts to Cultural Heritage Resources and Sites

TMJ has the potential to impact physical and cultural heritage sites that are subject to Kwantlen Rights and Title. The disturbance of any archaeology site is an infringement to Kwantlen Title.

Potential Impacts to Access and Use of Cultural Sites

Kwantlen has extensive documented use and occupancy in and around the project area. Access to the project area has been cut-off since the privatization and over-industrialization of Tilbury Island, which has impacted Kwantlen's rights to use and occupy an area that has historically been utilized for hunting, gathering, travel, and trade, and myriad other activities, since time immemorial.

Potential Impacts to Kwantlen First Nation's Cultural Experience of the Project Area

As stated above, the project impacts Kwantlen's rights and title with respect to protecting archaeology sites from disturbance as well as using and occupying the project area. These infringements have a serious impact to Kwantlen's Cultural Experience of the project area. In the past, Tilbury Island was a place that was regularly accessed and used for subsistence, cultural, ceremonial, and economic activities. In Kwantlen's view, the area has become over-industrialized from colonial governments prioritizing private companies and 'stakeholders' instead of the original and unextinguished title of local First Nation's communities. This has led to the ongoing disenfranchisement of Kwantlen from their broader territory, which heavily contributes to hardship experienced by some members.

Kwantlen's Conclusion

In consideration of the available information, consultation with Kwantlen First Nation, Kwantlen First Nation's engagement with TJLP, TJLP's commitments and the EAO's proposed EAC conditions if an EAC is issued, TMJ is expected to result in significant impact on Kwantlen First Nation's traditional and cultural interests.

Biophysical:

- *Tilbury Island has undergone swift and major changes in the past 100 years, from heavily forested old growth to industrial zoned work site with several tenants. The original habitat was destroyed, and the current state does not support wildlife, migratory birds, and other flora/fauna. This complete eradication of natural space contributes to the climate crisis, biodiversity crisis, and alienation of Kwantlen members from this important area of the territory.*

Site Use and Access:

- *Tilbury Island can no longer be used by Kwantlen due to private interests and restricted access, despite Kwantlen's unextinguished title.*

Cultural and Experiential:

- *The Cultural and Experiential impacts to Kwantlen's rights and title are difficult to articulate in these kinds of forms and can only be fully realized by understanding members' experiences and fully understanding the history and scope of cultural genocide that's taken place. Kwantlen has lost access to this part of the territory and is unable to practice traditional or contemporary activities on this land, making the Cultural and Experiential impacts significant to the Nation.*

Mitigations:

- *Kwantlen cares deeply about ensuring the natural environment is protected and enhanced wherever possible to improve the salmon returns and bring other species, such as eulachon and sturgeon, back from endangered/SARA status. Given that the world is experiencing a climate crisis and biodiversity extinction event, we do not support fossil fuel export projects that contribute to these crises and destroy habitat along the supply chain (i.e., north eastern BC). We continue to assess and provide feedback on the mitigation measures in the provincial and federal draft conditions;*
- *Despite our opposition to such export projects, we recognize that the provincial government is looking forward to natural gas expansion despite the risks to the environment and First Nation's rights and title. Kwantlen wants to continue dialogue with TJLP to mitigate risks wherever possible if the project is approved and begin*

discussions about an Impact Benefit Agreement;

- *Any ground disturbance work that takes place during the project will require a Kwantlen Cultural Monitor on-site; and*
- *TJLP Corporate culture should consider the impacts of specific legacy initiatives to work with local First Nations to enhance their connections to land and place where they work and benefit from. Examples include art opportunities to local First Nations, and the incorporation of traditional cultural/historical teachings led by First Nations where appropriate, as well as sponsorship of various First Nation educational and cultural events and opportunities to promote cultural wellness and healing.*

E. IMPACTS TO CLIMATE CHANGE

Kwantlen First Nation has raised the following concerns regarding the effects of the project on Climate Change and air quality:

- *Increased GHG Emissions; and*
- *The increased demand for Natural Gas resulting from the project*

Kwantlen acknowledges that LNG and natural gas are a better alternative to options like coal; however, when the process to acquire natural gas includes processes like Hydraulic Fracturing (Fracking) the methane released in the process needs to be considered. Methane is known to have a more significant impact towards global warming than CO_2. There is also no assurance that the market will reduce the consumption of coal as a result of using LNG. This in turn may be leading to a net increase in emissions worldwide. When considering the effects of a potential spill occurring at some point on the Fraser River, we have concerns about the effects the spill could have to local air quality. LNG when spilled will vaporize into the air leaving little work to clean up, but we do not have much information about the effects of the vaporized natural gas on the atmosphere and how it contributes to the climate crisis.

Reducing the effects of the climate emergency are a top priority. Rising sea levels have an impact on Cultural and Heritage Resources that have been protected, or not found yet. Increasing water temperatures are having an impact on fish ecosystems and migratory patterns. Lastly, the climate crisis has the potential to raise water levels in the river and create inhospitable areas on Kwantlen reserve lands, including the main reserve IR6. Kwantlen considers themselves tireless in their efforts to act as Stewards of the Land. We do not see this as the time to be increasing output for fossil fuels, including natural gas, when the science is clearly saying we need to transition from the fossil fuel economy for the sake of future generations.

Mitigations:

- *Have Safeguards in place to prevent methane escape during loading, unloading, and maintenance work;*
- *Ongoing Monitoring of GHG emissions during the project lifetime;*
- *Consider the entire supply chain and emissions that come from fracking in north east BC and methane leaks; and*
- *Stop approving new fossil fuel projects and encourage or provide incentives for transitioning to renewable-energy projects.*

14.3.4 KWANTLEN'S AND THE EAO'S JOINT SUMMARY

The EAO would like to thank Kwantlen for their authorship of their Part C assessment to inform the EAO's Assessment Report for referral to provincial and federal decision makers. The EAO appreciates Kwantlen's recognition that the EAO has undergone a revitalization process to incorporate a recognition of Aboriginal Rights and Title, honour the Crown's Constitutional obligation to receive prior and informed consent through meaningful consultation and accommodation. The EAO understands that Kwantlen would like to continue engaging with the EAO to improve the clarity on process of referral materials development, and also to seek further opportunities to include Kwantlen's impact assessment for public consultation in future EA processes.

The EAO has an obligation to reflect the Crown's views in Part C, and in doing so the EAO considered information from Kwantlen's Part C, as well as information gathered during consultation, and during the review of the Application and MSA. Such information has been included in the EAO's perspectives and inputs section, which includes the EAO conclusions using the EAO's impact assessment methods. While the EAO and Kwantlen may not have reached consensus on some items during the EA process for TMJ, the EAO and Kwantlen discussed Kwantlen's concerns related to TMJ and sought to understand, address, and resolve issues. The EAO views the meaningful effort to seek consensus as supporting the broader goal of reconciliation. Where consensus on conclusions was not reached, the parties endeavoured to reach consensus on the level of engagement.

Kwantlen First Nation's assessment of potential impacts to Kwantlen's Aboriginal Interests includes Kwantlen's analysis and conclusions for provincial and federal decision makers. The EAO understands that Kwantlen may not necessarily agree with the EAO's inputs and perspectives, and that Kwantlen Nation is of the view that their Part C assessment provides the appropriate conclusions for the decision makers to consider for understanding TMJ's potential to impact Kwantlen First Nation's Aboriginal Interests.

14.4 MUSQUEAM INDIAN BAND

14.4.1 COMMUNITY PROFILE

Musqueam Indian Band is a traditionally hən̓q̓əmin̓əm̓-speaking Central Coast Salish First Nation whose asserted traditional territory includes part of the Lower Mainland area in BC, including sections of the Fraser River and the Strait of Georgia. Musqueam Indian Band has Aboriginal Interests within this territory, including a proven Aboriginal right to fish as established in the *Sparrow* decisions, which are protected under section 35 of the *Constitution Act*, 1982. Musqueam Indian Band's identity and livelihood are intrinsically linked to their traditional territory and that their core teaching reflects the necessity of stewardship responsibilities, and of knowing who you are and where you come from. *Xʷməθkʷəy̓əm* translates to "Place of *məθkʷəy̓*", signifying the *məθkʷəy̓* plant, that once grew in abundance in the Fraser River delta and tidal flats (Musqueam, 2018)[209]. Musqueam Indian Band oral histories describe the delta as it was over 9,000 years ago, and that these oral histories are buttressed by radiocarbon dating at *səẇq̓ʷeqsən* located around the southern foundation of the Alex Fraser Bridge and studies of the sedimentation pattern of the Fraser River delta.

Musqueam Indian Band assert Aboriginal title over their traditional territory. The 1976 Musqueam Declaration identifies a core territory of approximately 144,888 ha[210], which encompasses the lands, lakes and streams defined and included by a line commencing at Harvey Creek in Howe Sound and proceeding eastward to the height of land and continuing on the height of land around the entire watershed draining into English Bay, Burrard Inlet and Indian Arm; south along the height of land between Coquitlam River and Brunette River to the Fraser River, across to the south or left bank of the Fraser River and proceeding downstream taking in the left bank of the main stream and the South Arm to the sea, including all those intervening lands, islands and waters back along the sea shore to Harvey Creek, and the sea, its reefs, flats, tidal lands and islands adjacent to the above described land and out to the centre of the Salish Sea (Strait of Georgia)[211]. TMJ would be within Musqueam Indian Band's Consultation, Accommodation, Resources Access (CARA) Boundary, which is the boundary that

[209] Musqueam Indian Band. 2018. Musqueam Indian Band Knowledge and Use Study for WesPac Midstream's Proposed LNG Marine Jetty Project.

[210] Musqueam Indian Band. 2007. Musqueam Community Profile: Knowing our Past, Exploring our Future.

[211] Musqueam Indian Band. 1976. *Musqueam Declaration*. Musqueam Indian Band. http://www.musqueam.bc.ca/sites/default/files/musqueam_declaration.pdf.

Musqueam Indian Band provided to BC identifying areas for consultation. Musqueam Indian Band has communicated to the EAO that TMJ is in Musqueam Indian Band's core territory. Musqueam Indian Band described to the EAO that Aboriginal title is a fundamental aspect of Musqueam identity and culture. Musqueam has not signed a treaty or otherwise surrendered or ceded its Aboriginal title within Musqueam's territory, as described in the 1976 Musqueam Declaration. Musqueam described its Aboriginal title as including the right to proactive governance and control over Musqueam lands and resources – in short, the right to choose how Musqueam title lands will be used, the right to manage Musqueam title lands, and the right to the economic benefits of Musqueam title lands.

Musqueam Indian Band has reported that their oral tradition establishes ancestral connections to these lands and waters, including the TMJ area since time immemorial[212]. Musqueam Indian Band's territory is described and known to them in a matrix of over 125 place names, but Musqueam Indian Band noted that that this is likely a low (conservative) estimate of the number of place names because many are not public. To Musqueam Indian Band these places are not limited to settlements (seasonal and winter), landscape features, and transformer sites, but also act as store houses of knowledge for oral traditions and histories of both individuals and Musqueam society as a whole. Musqueam Indian Band reported histories describe the delta as it was 9,000 years ago, a time when the Fraser River delta was only water, before its current sedimentation, and are confirmed by radiocarbon dating at *səwiqʷeqsən* and studies of the sedimentation pattern of the Fraser River delta[212].

Musqueam Indian Band informed the EAO that Musqueam Indian Band's location at the mouth of the Fraser River Delta is deeply entwined with Musqueam Indian Band's oral histories and cultural identity. At the time of contact, Musqueam Indian Band's exercised rights and control over salmon harvesting and other resource-harvesting areas in the lower Fraser River, and specific protocols were in place to control and regulate access by outside Nations to these areas based on kinship and inter-village ties. Musqueam Indian Band informed the EAO that a protocol exists whereby other Indigenous groups seeking access to waterways and resources in Musqueam Indian Band territory apply for permission through the Musqueam Fisheries Department.

[212] Roy, Susan. (2007). "Who were these mysterious people?": the Marpole Midden, Coast Salish identity, and the dispossession of Aboriginal lands in British Columbia (T). University of British Columbia. Retrieved from https://open.library.ubc.ca/collections/ubctheses/831/items/1.0076891

As of November 2021, Musqueam Indian Band has 1,472 registered members, with 677 registered members living on reserve[213]. Musqueam Indian Band presently has three reserves, located approximately 10 to 14 km from the TMJ site, accounting for approximately 0.2 percent (338 ha) of their core identified territory:

- Musqueam IR2 is the largest reserve, also known as the 'Musqueam Indian Reserve,' located south of Marine Drive at the mouth of the North Arm of the Fraser River;
- Sea Island IR3 is located opposite of Musqueam IR2 on the northwest corner of Sea Island at the outlet of the north arm of the Fraser River; and
- Musqueam IR4 is located in Ladner[214].

The diversity of resources available to, and used by, Musqueam Indian Band people along the Fraser River were extensive, but strongly centered around fish, which were depended on for a major portion of their annual diet, as well as for surpluses that could be traded (Musqueam, 2018). Salmon and other fish species (for example, sturgeon and eulachon) have been and continue to be an integral part of Musqueam life, language, culture, and economic systems for Musqueam Indian Band[209,210].

There are multiple runs of each species targeted by Musqueam Indian Band fishers and Musqueam Indian Band people processed fish and other food for storage to last throughout cooler months, including salmon, sturgeon, eulachon, clams, berries, ducks, and crab apples (stored in rainwater). Fishing areas and camps where fish was processed and dried are recorded along the Fraser River delta, and along the banks of the Fraser River, as well as at the mouth of the Coquitlam River[209]. Musqueam Indian Band report that, historically, they fished the Fraser River from the open ocean up towards Barnston Island and Pitt Lake[209].

Musqueam Indian Band fishing occurs over a wide geographical area, including all arms of the lower Fraser River, and that the lower Fraser River is where the majority of Musqueam Indian Band's FSC fishing is conducted[209]. Musqueam Indian Band fishers highlighted that different areas of the lower Fraser River are used for fishing at different times, depending on the complex interaction of each area with dynamic environmental factors and the target species of

[213] Indigenous and Northern Affairs Canada. 2021. First Nation Profiles – Musqueam Indian Band. https://fnp-ppn.aadnc-aandc.gc.ca/fnp/Main/Search/FNRegPopulation.aspx?BAND_NUMBER=550&lang=eng, accessed December 13, 2021.

[214] Musqueam Indian Band. 2011. *Musqueam First Nation: A Comprehensive Sustainable Community Development Plan*. Musqueam Indian Band. And AANDC. 2015. First Nation Profiles. http://fnp-ppn.aadnc-aandc.gc.ca/fnp/Main/Search/FNReserves.aspx?BAND_NUMBER=550&lang=eng.

fish to be harvested. Musqueam Indian Band explained that for this reason, all reaches of the lower Fraser are highly important to Musqueam Indian Band fishing[209].

Musqueam Indian Band members continue to have a deep connection to many fish species; however, decreases in the availability of sturgeon, eulachon, and shellfish has increased Musqueam Indian Band reliance on the salmon fishery[209]. Musqueam Indian Band also report decreased access and availability for sockeye, Coho, and Chinook, which is shifting Musqueam Indian Band to have greater reliance on crab and prawn for FSC purposes. Members desire to harvest these, and other, species once stocks reach harvestable levels and issues of contamination have been addressed[209].

Stewardship is central to being Musqueam, noting that members are continuously innovating and taking measures to restore wild resources, including through selective fishing measures and self-imposed restrictions on harvesting[209]. From Musqueam's perspective, it can be difficult to separate out each individual species, as separate VCs, from the other interrelated elements of Musqueam territory. Musqueam people see themselves as belonging to the earth, as a child belongs to their mother, which comes with a responsibility for care that extends to SRKW, salmon, sturgeon, eulachon, and all other species. For Musqueam, this care or stewardship responsibility carries its own cultural significance and contributes to Musqueam sense of identity. Musqueam's Sense of Place and Identity and Cultural Continuity are intrinsically linked to the health and wellbeing of all interrelated elements of Musqueam territory.

Musqueam Indian Band reported in the KUS prepared for the RBT2 panel hearings (noted in the TMJ MSA) that fishing in the ocean and the Fraser River was important to them and fishing values were reported in the LSA of their KUS for RBT2 which overlaps with RBT2 shipping channels. Musqueam Indian Band reported that marine invertebrates (e.g., bivalves, abalone, octopus, sea urchins, sea cucumber, etc.) are harvested within Musqueam Indian Band traditional territory and crabbing occurs extensively in the shallow flats of the Salish Sea. Musqueam Indian Band report that kelp continues to be an important food and medicinal plants and that they must now trade for it either because it cannot be found, or it is avoided due to contamination concerns. For Musqueam, *q̓əlɬaləməcən* (Orcas) and specifically SRKWs, are a culturally and spiritually significant species through their importance to Musqueam's cultural heritage and current use of land and resources for traditional purposes.

Musqueam Indian Band hunted terrestrial and marine mammals and birds, such as deer, elk, waterfowl, and whales throughout their territory[209]. Douglas Island, and some marshes in Richmond were identified as key areas for hunting and habitat[209]. Members recall how they have hunted within areas of Metro Vancouver (e.g., Burns Bog) within their lifetimes[209].

Musqueam Indian Band have said that hunting remains an important activity for both subsistence purposes and for Musqueam Indian Band culture, and that the site-specific data

indicates that they have used and continue to use the Study Area (Knowledge and Use Study Area) defined in the Musqueam Indian Band Knowledge and Use Study for hunting[209]. Musqueam Indian Band reported that:

> *"The act of hunting itself continues to be a crucial aspect of Musqueam identity, culture, and society. Hunted species are still sought for ceremonial (e.g., bird feathers often appear in ceremonies) and subsistence purposes. As with other traditional subsistence activities, hunting is also a highly social event, from hunting knowledge transmission and preparation to success, to the sharing and distribution of meat, to the consumption of hunted resources, such as in community gatherings where they are a staple."* (p. 107-108)

Musqueam Indian Band have reported that plants such as broad leaf maple were harvested to create paddles or poles, yew was used to fashion bows, while alder served to smoke-dry fish or clams, and Western red cedar—particularly abundant in the New Westminster area until at least the mid-nineteenth century—was used to make baskets and other material goods (for example, canoes, bailers) that were sometimes traded at a European village site in the Pattullo Bridge area, upstream of the TMJ area [209]. Root plants, raspberries, berries, camas, salal and medicinal plants such as hemlock and wild licorice were also noted in the written records of European explorers as highly valued and used.

14.4.2 MUSQUEAM'S INVOLVEMENT IN THE CONSULTATION PROCESS

The EAO set out its approach to consultation, including an initial assessment of strength of claim and potential impacts on Musqueam Indian Band's Aboriginal Interests in a letter to Musqueam Indian Band dated June 18, 2015. Based on the Province's initial strength of claim assessment, Musqueam Indian Band was consulted at the deeper end of the spectrum as set out in Schedule B of the Section 11 Order for TMJ. The EAO led consultation activities with the Indigenous Groups identified in Schedule B and, as part of this work, invited Musqueam Indian Band to participate in the Working Group. As part of the Working Group, the EAO invited Musqueam Indian Band to review and provide comments on TJLP's Application and MSA Supplemental Analysis, the EAO's draft Assessment Report (including Part C of the Assessment Report), the draft CPD, draft provincial Certificate Conditions and the draft KMMs recommended under CEAA 2012.

The EAO is of the view that it has approached consultation with Musqueam Indian Band at the deeper end of the spectrum, with the intent to identify potential impacts and consider ways to address potential impacts to any Aboriginal Interests in the project area identified by Musqueam Indian Band. In response to feedback received from Musqueam Indian Band, the EAO revised its draft referral materials to include additional information related to Musqueam Indian Band's perspectives on the EA consultation process and key concerns raised by

Musqueam Indian Band regarding cumulative effects and TMJ-related impacts to Musqueam Indian Band's Aboriginal Interests.

During the EA process, the EAO and Musqueam Indian Band discussed TMJ concerns and sought to understand, address, and resolve issues. The EAO invited Musqueam Indian Band to review and provide comments on the draft Section 11 Order, the draft VC Selection document, the draft AIR, TJLP's Aboriginal Consultation Plan and Reports, the screening of the Application and on the Application and supplemental material, as well as the opportunity to review and comment on several iterations of the EAO's draft decision materials. As part of the EA Working Group, Musqueam Indian Band also participated in technical meetings, teleconferences, and site visits (February 2016 and October 2018) during the Pre-Application and Application Review stages.

The EAO met with Musqueam Indian Band prior to, and at the beginning of Application Review (January 25, April 29, and May 4, 2019) to understand Musqueam Indian Band's desired approach to consultation on the EA. The EAO and Musqueam Indian Band agreed to engage in an iterative review of the Application and the EAO's referral materials. To support this iterative and in-depth review process, the EAO provided additional capacity funding to support Musqueam Indian Band's participation in collaborative undertakings, and a joint workplan was agreed to that identified key meetings throughout the process.

During Application Review, the EAO and Musqueam Indian Band regularly discussed concerns over the phone and in person and worked together to find appropriate dates for working group meetings, revise meeting minutes, revise the workplan and discuss appropriate review timelines. The EAO and Musqueam Indian Band endeavoured to work cooperatively to find mutually agreeable solutions and timelines.

TJLP began consulting with Musqueam Indian Band in February 2014, before entering the EA process. TJLP reports that consultation and information-sharing events have included multiple meetings, letters, email exchanges and phone calls. A summary of TJLP's engagement activities with Musqueam Indian Band is provided in TJLP's Application and in TJLP's Aboriginal Consultation Reports.

The Application states that TJLP provided Musqueam Indian Band with funding for a TMJ-specific study regarding their Aboriginal Interests in TMJ area. Musqueam Indian Band prepared two studies regarding their Aboriginal Interests in the TMJ area:

- Musqueam Indian Band Knowledge and Use Study, WesPac Midstream's Proposed LNG Marine Jetty Project[209]; and
- Impacts of marine vessel traffic on access to fishing opportunities of the

Musqueam Indian Band[215].

During the EA, Musqueam Indian Band and TJLP worked together to develop and reach agreement on a Marine Communication Protocol. This bilateral protocol aims to avoid or minimize interactions with Musqueam fishers and other cultural activities and includes an oversight committee and funding to facilitate an ongoing one-to-one open line of communication between TJLP and Musqueam Indian Band for the life of the project. This protocol also includes mechanisms to continuously improve the coordination of real-time communication and planning/scheduling to avoid fishing windows by TMJ related vessels, provide notice for Musqueam member safety awareness, and compensation for lost or damaged nets during construction. The protocol was updated in response to the KMMs added following the BVSA.

Musqueam Indian Band have informed the EAO that the site-specific values and uses reported in Musqueam's Knowledge and Use Study[209] are limited to those reported by Musqueam members that were available to participate in the study; the study did not capture the totality of the community values and uses and numbers should be understood and conservative estimates or minimums. Musqueam Indian Band expressed concerns about the initial scope of the assessment which excluded a Marine Shipping Assessment. Because the marine shipping assessment was brought into the review at a later stage in the process, Musqueam Indian Band has expressed that it was not possible to adequately engage in consultation related to the MSA due to lack of time and capacity strengths.

The EAO has worked with Musqueam Indian Band and has incorporated Musqueam Indian Band's detailed comments into the Current Use section (Section 11.4) and Part C of this Report. In addition, the EAO has refined the assessment and updated conclusions on Current Use and Part C to reflect the additional information provided by Musqueam Indian Band. In May of 2020, Musqueam Indian Band wrote to and informed the EAO that as a result of COVID-19, it would not be possible for Musqueam Indian Band to collect the requested supplemental information for the MSA within the timelines to inform the TMJ assessment. Musqueam Indian Band commented that if TMJ is approved, it will still be necessary for TJLP to work with Musqueam Indian Band to collect the information for TMJ to inform mitigation strategies and management plans, prior to finalizing plans and design guidelines. Musqueam Indian Band

[215] Musqueam Indian Band. 2018B. Impacts of marine vessel traffic on access to fishing opportunities of the Musqueam Indian Band.

requested that the requirement to collect the information and conducting the required analysis included as a condition on the EAC.

During the EA for TMJ, the EAO heard from Musqueam Indian Band that they have an expectation for the EAO to undertake and meet a justification test prior to Ministers' decision if there is a finding of an infringement of Musqueam Indian Band's *Sparrow* fishing right. The EAO indicated to Musqueam Indian Band that it would be willing to consider the factors relevant to the *Sparrow* justification analysis if there was information indicating a potential impact to Musqueam Indian Band's right to fish from TMJ. The EAO then provided Musqueam Indian Band with information relevant to the *Sparrow* justification analysis in a separate response. The EAO is of the perspective that it is not required to undertake or meet a justification test when concluding on potential impacts to Aboriginal rights during the EA.

The EAO understands that Musqueam Indian Band does not view EAC conditions as being adequate in addressing impacts on its rights, and Musqueam Indian Band consider that such "blanket" conditions (where the conditions reference Schedule B Indigenous Groups) would actively diminish Musqueam's ability to mitigate the impacts of TMJ (see below re: Musqueam's separate submissions for more information). During the EA for TMJ, the EAO consulted with Musqueam Indian Band to develop appropriate mitigations to address Musqueam's concerns, which are reflected in the provincial conditions and recommended KMMs under CEAA 2012. During the EA for TMJ, Musqueam Indian Band requested Musqueam-specific conditions, and there were several conversations around how this could be done. The EAO recommends a Cultural Heritage under CEAA 2012, which would require TJLP to develop nation-specific measures to address the effects on tangible and intangible cultural losses caused by TMJ, in consultation with those Indigenous Groups experiencing the effects in the lower Fraser River (as described in this Report), and to consider developing or contributing to Indigenous-led programs to preserve and enhance cultural heritage. Musqueam Indian Band and the EAO have an ongoing discussion to explore future opportunities to better support Musqueam's ability to effectively address impacts to Musqueam's Aboriginal Interests through future EA processes on other Projects proposed within Musqueam Indian Band's territory.

Provincial conditions and recommended KMMs under CEAA 2012 for TMJ would also require future engagement to be provided to all Schedule B Indigenous Groups, including Musqueam Indian Band, and each Indigenous Group would determine the level of engagement needed. The EAO acknowledges that Musqueam Indian Band and other Indigenous Groups have different interests in the TMJ area, and TMJ has the potential to impact Indigenous Groups differently. The EAO acknowledges that understanding the fundamental linkage between presence of Aboriginal Interests in an area and potential impacts to these interests is needed to appropriately customize engagement with each Indigenous Group. Furthermore, the EAO considers that this approach to customizing engagement with each Indigenous Group is

consistent with the *Declaration on the Rights of Indigenous Peoples Act*, 2019 which requires the government to consider the diversity of the Indigenous peoples in BC (i.e., including distinct languages, cultures, customs, practices, rights, legal traditions, institutions, governance structures, relationships to territories and knowledge systems of Indigenous peoples).

Reliance on information from the RBT2 and TMX processes

Musqueam Indian Band raised concerns with the EAO's approach of using information collected for the assessments of TMX and RBT2 projects, and in particular, that it cannot be relied upon for a fulsome representation of current use within Segment A-1 of the MSA. Musqueam Indian Band noted that supplemental data collection on Musqueam Indian Band's current use is needed to fully understand and assess the impacts of TMJ. Musqueam Indian Band is concerned that the spatial and temporal limitations (i.e., using information from a 2017 RBT2 Knowledge and Use Study) of the underlying data in the MSA would result in the EAO underestimating the impact of TMJ on Musqueam Indian Band's current use. Musqueam Indian Band submitted extensive comments on this and other matters to the EAO. The EAO incorporated this additional information into the EAO's Current Use chapter and refined the assessment and updated the conclusions on Current Use to reflect the additional information that Musqueam Indian Band provided. As described in the Current Use of Lands and Resources for Traditional Purposes section of Part B, the EAO found it is reasonable to expect that past effects would combine with effects from TMJ-related marine shipping to result in significant cumulative effects to current use for fishing and other cultural use of marine areas for Indigenous Groups that preferentially use or rely on sites located at TMJ or within and adjacent to shipping lanes. Further information related to concerns raised by Indigenous Group's with respect to reliance on information from RBT2 and TMX processes is provided in Section 13.2.1 of this Report.

Cultural and Spiritual Interests in Southern Resident Killer Whales

During review of the CULRTRP section of the EAO's draft Assessment Report, Musqueam Indian Band identified a concern that Musqueam's significant cultural and spiritual interests in Orca, especially SRKW, were not accurately reflected in the draft materials. Musqueam Indian Band identified that SRKW are a culturally and spiritually significant species through their importance to Musqueam Indian Band's cultural heritage and current use of land and resources for traditional purposes. Musqueam Indian Band also identified that, it can be difficult to separate SRKW as a separate VC, from the other interrelated elements of Musqueam's territory. Musqueam people see themselves as belonging to the earth, as a child belongs to their mother, which comes with a responsibility for care that extends to SRKW, salmon, sturgeon, eulachon, and other species. During the EA, Musqueam Indian Band and the EAO worked collaboratively to ensure that Musqueam's cultural and spiritual significance to SRKW was appropriately reflected in in the Assessment Report, including sections below.

Musqueam Indian Band's Letters and Separate Submissions to Ministers

On September 21, 2021, Musqueam Indian Band wrote to the BC Ministers, Federal Ministers, the EAO, and the Agency regarding TJLP's unconventional offset proposal. In the letter Musqueam Indian Band identified that while some of Musqueam Indian Band's concerns have been addressed through the EA process there remains significant outstanding concerns related to cumulative effects. Musqueam Indian Band views the proposal as an appropriate approach to contributing to the mitigation of some of the cumulative effects on Musqueam's territory. Please see Section 13.1 of Part C for more information on how the EAO has considered TJLP's unconventional offsetting proposal in the EA for TMJ.

Also, on September 21, 2021, Musqueam Indian Band wrote to the Minister of Environment and Climate Change Strategy and the Minister of Transportation and Infrastructure regarding: Submission to Ministers for the TMJ Project. The EAO provided both of Musqueam Indian Band's letter and separate submissions, both dated September 21, 2021, to decision makers as part of the TMJ referral package.

Following review of TJLP's BVSA Report, and the EAO's revised materials, Musqueam Indian Band provided a separate submission and a consent letter for TMJ (both dated August 15, 2022), which the EAO also included in the referral package for decision makers at time of referral.

Musqueam's outstanding concern with the EAO's approach to cumulative effects:

Musqueam Indian Band's separate submissions for TMJ emphasized an urgent need for the EAO to address deficiencies in the EAO's cumulative effects methodology used for individual projects, particularly as the ecological health of the region is in a crisis state and impacts in Musqueam Indian Band's territory, especially in the Fraser River Delta, are severe. Musqueam Indian Band considers that addressing such deficiencies must include establishing a carrying capacity for the Fraser River Delta to understand the limits of development so that ongoing and future project proposals can be more accurately assessed.

In its separate submissions, Musqueam Indian Band reference the recent *Yahey* v. *British Columbia* decision and identified that in Musqueam Indian Band's view, some of the circumstances faced by Musqueam Indian Band are parallel to those experiences of Blueberry River First Nations and that the Province is responsible for ensuring that there are timely enforceable mechanisms to assess and manage the impact of industrial development in Musqueam Indian Band's territory as this relates to project specific and existing cumulative effects.

Musqueam's outstanding concern with the EAO's approach to Indigenous consultation:

Through the separate submission, Musqueam Indian Band identified several concerns related to the EAO's approach to consultation and accommodation for TMJ, including the EAO's conclusions that the residual effects from TMJ would combine with cumulative effects from past, current and future activities to result in significant cumulative effects to the current use of lands and resources for fishing and cultural heritage by Musqueam Indian Band and other Indigenous Groups. From Musqueam Indian Band's perspective, the EAO's conclusions obscure that Musqueam Indian Band is one of, if not the, Indigenous Group most significantly impacted by the project. Musqueam Indian Band also considers that the EAO's conclusions related to potential future uses of the marine terminal area for fishing by other Indigenous Groups that do not currently use the area is problematic, and that the EAO and the Agency are unwilling and inflexible to consider Musqueam-specific conditions, despite the distinct impacts of TMJ on Musqueam Indian Band and the fact that such an approach was taken on other past assessments.

The EAO understands that Musqueam Indian Band takes exception to the EAO's approach towards consultation and accommodation with other Indigenous Groups for TMJ, where Musqueam Indian Band considers these Indigenous Groups are asserting unproven claims of title and rights in Musqueam Indian Band territory. Throughout the assessment for TMJ, the EAO heard through comments, letters and dialogues that Musqueam Indian Band is frustrated with the EAO's failure to distinguish between the twelve Schedule B Indigenous Groups, as defined in the Section 11 and 13 orders, and that from Musqueam Indian Band's perspective, the EAO is eroding Musqueam Indian Band's ability to continue to exercise their proven *Sparrow* fishing right and maintenance of their cultural continuity.

Musqueam Indian Band also told the EAO that "blanket" conditions actively diminish Musqueam Indian Band's ability to have the impacts of TMJ mitigated, because such conditions would permit all Schedule B Indigenous Groups equal participation, regardless of the level of impacts on their rights. Musqueam Indian Band identified that in their view, under the EAO's current process, Musqueam Indian Band's attempts to have impacts on rights addressed through EAC conditions have been generally frustrated by the EAO's requirement for the condition to apply to all Schedule B Indigenous Groups.

Musqueam's request for the EAO to resolve the issue in future environmental and impact assessments in Musqueam territory:

The EAO understands through Musqueam Indian Band's separate submission for TMJ that Musqueam Indian Band's traditional governance relies on established relationships and protocols with neighbouring First Nations, and that the EAO's policies can systematically

undermine this governance by creating opportunities for other Indigenous Groups to participate in rights-based activities in Musqueam Indian Band's core territory in ways that are not appropriate or consistent with Musqueam culture and governance. The EAO heard that Musqueam Indian Band considers it harmful to have other Indigenous Groups asserting and exercising rights within Musqueam Indian Band territory, especially for activities related to cultural recognition and revitalization. The EAO heard that the EAO's approach to consultation and accommodations in Musqueam Indian Band territory has the potential to further perturbate legal and political complexities, frustration, and conflicts for Musqueam Indian Band with other Indigenous Groups. The EAO also understands that Musqueam Indian Band is also concerned that the EAO's policies can also result in as many as a dozen Indigenous Groups developing strategies to mitigate impacts on culture and other rights-based activities, which would have a pan-Indigenizing effect on cultural representation that actively erodes Musqueam Indian Band's distinct culture.

Through Musqueam Indian Band's separate submissions to ministers for TMJ, as well as Musqueam Indian Band's feedback on the EAO's draft referral materials, including the EAO conclusions on potential impacts to Musqueam Indian Band's Aboriginal Interests, and through Musqueam Indian Band's September 21, 2021 letter regarding TJLP's unconventional offset proposal for TMJ, the EAO understands that despite significant concerns about the EAO's approach to cumulative effects and Indigenous consultations, Musqueam Indian Band has continued to work with the EAO, the Agency, and TJLP to ensure impacts to Musqueam Indian Band's Aboriginal interests are mitigated and accommodated, to the extent possible.

Musqueam Indian Band indicated that, subject to satisfactory finalization of conditions and mitigation measures, Musqueam Indian Band is satisfied with the progression of the environmental assessment of TMJ and believes it is ready to proceed onto referral to the appropriate ministers for decision. Musqueam Indian Band emphasized that the concerns related to the EAO's approach to cumulative effects and Indigenous consultation are being expressed at the conclusion of TMJ's assessment, noting the importance of addressing these issues in all future environmental and impact assessments in Musqueam territory.

14.4.3 POTENTIAL IMPACTS TO ABORIGINAL INTERESTS

The following sections focus on potential impacts of TMJ to Musqueam Indian Band's Aboriginal Interests. A discussion of the EAO's assessment approach is summarized in Section 12 on the EAO's consultation process methodology of this Report.

The EAO considered information available, including from public sources, Musqueam Indian Band's Knowledge and Use Study[209], Musqueam Indian Band's Shipping Study[215], as well as relevant issues raised by Musqueam Indian Band members during the EA process (in meetings, letters and Working Group comments), in the following assessments of the potential impacts of TMJ on Musqueam Indian Band's Aboriginal Interests.

Musqueam Indian Band identified three rights-based VCs relating to Musqueam Indian Band knowledge and use that they concluded would be impacted to a substantial degree by TMJ[209]:

- Cultural continuity;
- Sense of place and identity; and
- Fishing.

Musqueam Indian Band expressed the importance of understanding that although Cultural Continuity and Sense of Place and Identity are distinct from fishing, harvesting and the biophysical environment, they are inherently connected to and dependent on each other. The EAO's following assessment of TMJ's potential impacts to Musqueam Indian Band's rights to fish (section A below) and hunt, trap and gather (section B below), included potential impacts to Musqueam Indian Band's cultural continuity and sense of place and identity, which the EAO understands are foundational concepts that inform the understanding of impacts to all Musqueam Indian Band's Aboriginal Interests. The EAO also assessed potential impacts to Musqueam Indian Band's Cultural Continuity (Section C below) and Sense of Place and Identity (Section D below) as requested by Musqueam Indian Band.

A. POTENTIAL IMPACTS ON FISHING

Musqueam Indian Band has an established Aboriginal right to fish for FSC purposes, as established in the Sparrow decision (R v. Sparrow, [1990] 1 S.C.R. 1075). Musqueam Indian Band has reported that fishing (including salmon, sturgeon, and eulachon) has and continues to be an integral part of Musqueam life, language, culture, and economic systems. Fishing and activities associated with fishing (for example, preparation for fishing and fish processing) are key cultural and livelihood activities for Musqueam Indian Band; waterways provide transportation corridors, and spiritual and cultural benefits as well as food. Additionally, fishing provides tangible and intangible benefits for Musqueam Indian Band members. Members also reported fishing values in the LSA of their Knowledge and Use Study prepared for the RBT2 panel hearings, which overlaps with the shipping channels in the TMJ MSA area.

Fishing is an important source of food and nutrition as well as income for Musqueam Indian Band members. Musqueam Indian Band has reported that some members hold commercial licenses for various fish species or participate in commercial fishing as deckhands and net

menders, as well as by processing fish and fixing boats and traps. Musqueam Indian Band identified fishing and the stewardship associated with fishing (knowledge, landscape, and resources) as forming a core part of Musqueam Indian Band's identity and sense of place, providing many benefits to Musqueam Indian Band's spiritual, psychological, and cultural wellbeing. Stewardship is central to being Musqueam, noting that members are continuously innovating and taking measures to restore wild resources, including through selective fishing measures and self-imposed restrictions on harvesting[209].

Musqueam Indian Band reported that access to migratory species, such as chinook, Coho, sockeye, pink and chum salmon, and steelhead and cutthroat trout fluctuated seasonally, with salmon spawning in the Fraser River between spring and early winter, with peaks in August and early September[209]. Musqueam Indian Band dried and stored salmon to use during the winter months. Musqueam Indian Band knowledge holders have stated that TMJ area is an important holding area for salmon and eulachon.

Musqueam Indian Band that participation in fishing and activities associated with Fishing provides irreplaceable opportunities for Musqueam people to share knowledge related to Musqueam culture, territory, practices, history, and hən̓q̓əmin̓əm̓. Musqueam Indian Band reported that fishing and time spent on the water are critical for the transmission of traditional knowledge, history, and language, including teaching place names, the locations of key harvesting and habitat areas, how to read and navigate waterways, and traditional fishing techniques[209]. Musqueam Indian Band report members emphasize that they share this knowledge with their own children and younger members of the Musqueam Indian Band community today in order to ensure cultural continuity, and often do so by taking younger members on the water, to go fishing and to teach Musqueam Indian Band oral histories while in these places together[209].

Musqueam Indian Band described members' current fishing practices as follows:

> *"Musqueam fishers primarily use gillnets for harvesting fish on the lower Fraser River (Musqueam Indian Band v. The Vancouver Fraser Port Authority 2016, 23). Musqueam gillnetters deploy 300-foot nets from fishing boats. The net is suspended from floats and drifts along with the tide, catching fish as it moves. The net is then pulled into the boat and the fish removed. Critically, reorienting and retrieving the net once deployed is a slow and difficult operation. Nets are also easily affected by the tide and currents, as well as propeller wash and drag from passing boats."* (p. 83)

Musqueam Indian Band fishers note that gillnetting "*is highly susceptible to shipping interactions because retrieving nets once deployed is slow and difficult (increasing the chances for collision)*" and both fishing and shipping are timed to the tides. Musqueam fishers note that

this has led to loss of fishing equipment in the past and emphasized that safety is becoming a primary concern while fishing when large vessels are on the river."[209] (p. 94)

Musqueam Indian Band reported that most members (56 %) participate in resource harvesting, and 61 % prepare traditional foods at least occasionally (Musqueam, 2018). Many Musqueam Indian Band members indicated that they would like to harvest or prepare traditional foods more often (Musqueam, 2018). Resources were accessed through year-round and seasonal settlements throughout the Fraser River delta, including those documented at the mouth of the Brunette River, the mouth of Glen Creek, and along the Coquitlam and Pitt Rivers. Musqueam Indian Band told the EAO that their future needs for FSC resources would likely increase because their population is expected to continue to grow over time.

In the Musqueam Indian Band Knowledge and Use Study[209], the Project Jetty Footprint was identified as the area within 250 m of the proposed jetty development site and its physical works. Musqueam Indian Band has noted that this area is an important fishing location due to its unique environmental characteristics, which create favourable habitat for salmon and eulachon as a holding area. Musqueam Indian Band noted that the consistent and shallow profile of the riverbed in the Project Jetty Footprint makes it a productive salmon fishing area and is used by Musqueam Indian Band fishers and salmon research vessels.

Musqueam Indian Band has raised concerns regarding the existing cumulative effects of development on Musqueam Indian Band's Aboriginal Interests within their traditional territory. Musqueam Indian Band reported that TMJ-specific effects would occur in a context of existing, long-term, multi-source, and large-scale adverse impacts on Musqueam Indian Band's territory, rights, and interests as identified by members[209]. Sources of cumulative effects as identified by Musqueam Indian Band include, but are not limited to, agricultural effects and pollution, urban and industrial development on Musqueam Indian Band's title lands, river dredging and deepening, overfishing, marine traffic and port expansions, recreational marine use, log booms and booming activities, climate change, and other riverine structures such as jetties, piers, docks, bridges, and ports. Musqueam Indian Band explained that its fishing rights in the region have been constrained by due to a variety of reasons, including a decline in the abundance and health of fish populations. Musqueam Indian Band expressed concerns through the Working Group that the existing level of disturbance and underwater noise is making at-risk marine mammals, such as SRKW, vulnerable to cumulative effects.

Musqueam Indian Band reported that their territory has changed significantly in recent decades and the current baseline level of exclusion from fishing opportunities across the territory is elevated from their perspective due to a variety of factors[215]. In the Musqueam Knowledge and Use Study, Musqueam Indian Band noted that due to these cumulative effects over time, most salmon streams and other animal habitats have been lost, leading to the decline in elk, bear,

and deer from Musqueam Indian Band's traditional territory[209]. Musqueam Indian Band reported a decline in abundance of target fish species, as well as a decline in the number of fishing vessels participating in the fisheries[215].

Musqueam Indian Band also reported that waterways in the region have been greatly impacted, including the Fraser River delta. This began in the early 20th century with the installation of river training structures and dredging for shipping channels, the construction of jetties, and sealing off other previously free-flowing areas (Musqueam, 2018). Because of this, Musqueam Indian Band reported that cumulative impacts have already significantly impaired their ability to practice their rights in much of their traditional territory. Musqueam Indian Band reports that development along the Fraser River, increased marine traffic, and changing legal licensing protocols have restricted Musqueam Indian Band's ability to fish in terms of space, time, quality, abundance, and method. Musqueam Indian Band has also commented that the context of Musqueam fishing activities is highly constrained around the TMJ site, and vulnerable to further cumulative effects in the lower Fraser River. Musqueam Indian Band emphasized that holding areas in the Fraser River (such as the TMJ site) are preferred, and noted increasing development added pressure for fishers to move into the shipping channels.

Musqueam Indian Band identified the following potential TMJ interactions with fishing in their Knowledge and Use Study[209], which focused on the TMJ jetty footprint, the KUS LSA (south arm of Fraser River from Sand Heads to Pattullo Bridge including the jetty footprint and river islands) and the KUS RSA [KUS LSA, jetty footprint and north and middle arms of the Fraser River (including river islands)]:

- *"Decreased and lower value of access and use on the Fraser River as a result of increases in the size and volume of marine traffic through the length of the Project shipping channel;*
- *Increased risk of collision or conflict between marine traffic and Musqueam vessels;*
- *Increased stress, behaviour changes, and mortality of fish as a result of changes in foreshore and in-river infrastructure, noise disturbances, vibrations, dredging, and ship vessel traffic;*
- *Increased degradation of valued fish habitat, including spawning grounds and fish rearing areas due to dredging;*
- *Decreased fish abundance and health due to pollution and accidents;*
- *Decreased fishing efficiency and access to traditional foods as a result of changes in fish abundance and behaviour, and disruptions caused by shipping traffic; and*
- *Decreased and lower value of access and use of preferred fishing areas due to*

dredging, construction, and the creation of exclusion zones; and impediments to Musqueam efforts to restore fish populations and habitat for the continuation of rights-based activities." (p.116).

The Musqueam Marine Traffic Study (2018) made several recommendations to address the impact of marine traffic on Musqueam fishing rights:

- Reduce the number of vessels interacting with Musqueam Indian Band's fishery openings;
- Monitor incidents of interaction between Musqueam Indian Band's fishing vessels and other vessel traffic;
- Encourage marine vessels to minimize and/ or avoid locations of interaction during fishery openings (e.g., high conflict zones in the lower Fraser River, such as Tilbury Island and Fraser Surrey Docks);
- Encourage marine vessels to minimize interactions during fisheries with gear types that require more time to deploy (e.g., crab and prawn fisheries, salmon seine fisheries);
- Engage with project proponents to design projects and adopt mitigation strategies that will minimize interactions with Musqueam Indian Band fishing opportunities; and
- Promote communication with marine vessel operators to encourage the implementation and adherence to measures that will minimize interference with Musqueam Indian Band fishing opportunities.

According to TJLP's ACR-4, during its review of TJLP's BVSA Report Musqueam Indian Band raised concerns related to the increased vessel traffic associated with the BVS, which could exacerbate existing conditions and further impact Musqueam Indian Band's fishing and other rights-based activities in the area. Musqueam Indian Band also noted that an increase in marine vessel traffic under the BVS may lead to greater exclusions for Musqueam fishers, present potential safety issues for Musqueam's navigation on the Fraser River and greater risks of accidents and malfunctions, and might surpass members' comfort threshold near Tilbury Island resulting in severe impacts for the quality of Musqueam's experience while undertaking rights-based activities and impact Musqueam's sense of place and identity. The EAO is also aware that Musqueam Indian Band is concerned that the increased vessel traffic associated with the BVS may have greater impacts on fish species, including white sturgeon, eulachon, and species of salmon that rely on the area around TMJ's proposed marine terminal as a key migratory corridor through the Fraser River, and that TMJ's contribution to cumulative effects in the area would further contribute to impacts to Musqueam's rights.

- The EAO's response to concerns and issues raised by Indigenous Groups regarding BVS-related changes to effects Fish and Fish Habitat can be found in that section of Part B (Section 5.6), as well as in Section 13.3.1.1.3 of Part C. Also, the EAO evaluated the potential for BVS-related changes to relevant pathways of effects on the biophysical, geospatial, and other social, cultural, experiential sub-components of Aboriginal fishing rights summarized in Section 13.3.1.1.2 and is satisfied that those findings would apply to Musqueam Indian Band.
- The EAO agrees with TJLP's BVSA Report, that the EAO's conclusions on TMJ's potential effects to the Fish and Fish Habitat and fishing component of the Current Use would remain the same under the BVS, compared to the Application scenario. The EAO did however, identify that under the BVS there would be potential for higher frequency of interactions between TMJ vessels and Indigenous Groups conducting vessel based FSC fishing activities in the lower Fraser River.
- The EAO proposes provincial conditions and federal KMMs under CEAA 2012 that are related to the recommendations that came out of the 2018 Musqueam Marine Traffic Study[215], including the Marine Communications Plan, Marine Access and Transportation Plan, and Vessel Traffic Management Plan. Specifically, the Marine Access and Transportation Plan would include mitigations to reduce disruptions caused by construction and operations for commercial and non-commercial marine use or for members of Indigenous Groups to carry out traditional use activities including fishing for FSC purposes.
- Based on the assessment of TJLP's BVSA Report, the EAO is recommending additional mitigation measures for the Marine Access and Transportation Plan that would require TJLP to reduce potential interactions between TMJ-related vessel activity and vessel-based Indigenous fishing activities in the lower Fraser River to Sand Heads during FSC windows by: adjusting the LNG carrier call schedule annually; implement protocols to adjust LNG carrier arrivals and departures; make arrangements to work with other users in the area to synchronize bunker vessel arrivals and departures; and provide opportunities for safety training for Indigenous Groups more marine navigation in the terminal area.
- The EAO is aware that TJLP has committed to contribute up to $2 million to the FNFLF[75], which is a program led by several Indigenous groups that supports recovery programs for Chinook salmon, eulachon, and sturgeon in the Fraser River and Salish Sea. The EAO understands that Musqueam Indian Band worked collaboratively with TJLP to determine appropriate accommodations, and that Musqueam Indian Band views the proposal is an

appropriate approach to mitigating cumulative effects. For more information about the EAO's consideration of TJLP's contribution proposal see Section 13.1 on Current Context and Cumulative Effects in Part C.

- While the EAO is of the view that the potential impacts on Musqueam Indian Band's fishing rights have been avoided, minimized, and accommodated to the extent possible for the purposes of the EA, the EAO also recognizes that there are outstanding impacts, particularly cumulative effects, and these outstanding impacts are reflected in the EAO's conclusions in Part B and Part C for TMJ.

Musqueam Indian Band expressed concerns regarding the temporal limitations of using the 2017 KUS for RBT2 as a source for determined current use for TMJ. For example, Musqueam Indian Band reported an increased reliance on crab fishing since 2017 in the MSA area. Musqueam Indian Band has also indicated that an increase in prawn and crab fisheries has occurred for reasons including a decline in salmon abundance and related fishing opportunities.

The EAO notes in the RBT2 process, Musqueam Indian Band expressed concerns about the cumulative effects of large vessel in the Salish Sea, and that traffic is an ongoing hindrance to safe and effective fishing activities. Musqueam Indian Band stated the need for improved communication between Musqueam Indian Band fishers and large commercial vessels. In the MSA area, Musqueam Indian Band has informed the EAO Musqueam fishers have consistently communicated that current vessel traffic levels impede Musqueam Indian Band vessels engaging in rights-based fishing for FSC purposes and that the additional vessel movements associated with TMJ would increase this impact.

In the following analyses, the EAO considers the above information and Musqueam Indian Band's perspective in the analyses below, as well as mitigation measures that were identified in the Application, mitigation measures that were identified during Application Review, proposed conditions of the TOC and recommended KMMs under CEAA 2012

14.4.3.1.1 Potential Impacts to Fish and Fish Habitat

As per Musqueam Indian Band's Knowledge and Use Study[209], Musqueam Indian Band members have concerns related to TMJ's potential impacts, as described below:

- LNG Carrier and bunker vessel presence on the seascape and while at port;
- Noise and visual effects from construction and operation activities such as pile driving and dredging;
- Concern about potential project contributions to cumulative deposition of contaminants that could affect the quality of harvested foods, resources, and the ecosystem;

- Concerns around the consequences of an accident or malfunction at the jetty and/or for LNG carriers and bunker vessels while in transit; and
- Concerns related to activities such as pile-driving and dredging, which could cause vibration, noise, sedimentation, and riverine changes, could affect fish behaviour and mortality.

During the EA, Musqueam Indian Band identified a concern that TMJ-related vessels operating in the dredge pocket may pose a risk to sturgeon that use the TMJ area for holding and rearing. Musqueam Indian Band identified that the TMJ area is also used by juvenile sturgeon at certain times of the year when decaying eulachon can become prevalent in the area, providing a food source to juvenile sturgeon that act as nature's scavengers. In the Fish and Fish Habitat section of Part B (Section 5.6) the EAO identified potential low magnitude effect for mortality or injury to sturgeon from TMJ-related vessel strike that could result in a small change on sturgeon abundance. The EAO predicted that potential for high population-level effects from TMJ would be unlikely in any scenario; however, the EAO acknowledges that the loss of a large, mature female could have a greater effect because this species takes a relatively long time to reach the age of first reproduction.

The EAO acknowledges Musqueam Indian Band's stewardship and cultural connections to sturgeon and appreciates Musqueam Indian Band's concerns about potential impacts to sturgeon are rooted in Musqueam Indian Band's indigenous ecological knowledge at the TMJ site. The EAO understands that there would be a limited time period during which deep draft vessels would have propellors near the bottom of the dredge pocket and the EAO concluded that injury or mortality to sturgeon from TMJ-related vessel strikes would not be expected to result in a significant residual effect. The EAO is recommending as a KMM under CEAA 2012 for the Fish Mitigations to Reduce Harm and Mortality, including provisions for side-scan sonar surveys for sturgeon once the dredge pocket has been established to inform sturgeon occupancy mitigation and recording and reporting observations of sturgeon mortality or injury at the Marine Terminal Area to Indigenous Groups and DFO. The development of the Fish Mitigations to Reduce Harm and Mortality would be in consultation with Musqueam Indian Band should TMJ be granted an EAC Certificate.

The Application also described a number of Musqueam Indian Band concerns related to fish, such as loss of fish habitat and disturbances to fisheries resources, potential impacts on a holding area for fish that knowledge holders have identified as overlapping the TMJ site, the potential for sturgeon habitat to be created and the possibility that vessel movement may disturb sturgeon that are attracted to this habitat. The Application also described Musqueam Indian Band's concerns related to potential impacts of TMJ-related shipping on SRKW which

could lead to an increase in seal and sea lion populations, which could affect salmon stocks and impact Musqueam Indian Band's subsistence salmon harvesting.

14.4.3.1.2 Potential Impacts to Access and Use of the Area for Fishing

Musqueam Indian Band reported[209] site-specific fishing values (e.g., subsistence, environmental, habitation, cultural, and transportation values) potentially affected by TMJ, including:

- Knowledge and Use study Project Jetty Footprint (an area defined in Musqueam, 2018 as being within 250 m of the proposed TMJ): 54 site-specific fishing values including fishing sites used to harvest a variety of species, key habitat features for fish (such as spawning areas and migratory routes) travel routes used by Musqueam Indian Band members to access fishing sites and fisheries, and a past Musqueam Indian Band habitation. Through consultation during the EA, Musqueam identified that areas overlapping the Project Jetty Footprint (within 250 m of the proposed TMJ – defined in KUS) become increasingly important for FSC harvesting activities depending on many different and interacting factors. For example, Musqueam identified that the site could potentially become Musqueam's only access for FSC fishing in the future if in-river salmon gillnet fisheries were no longer allowed by DFO. In another example, the KUS described Musqueam's reliance on the site when fishing at other locations becomes impractical due to the high rate of competition for fish from seals and sea lions in the river, which has also been increasing over time;
- Musqueam recognize this site as currently representing the only remaining site in their traditional territory that could support traditional near-shore communal harvesting activities (e.g., eulachon harvesting at high-tide), which Musqueam Indian Band has a strong desire to resume in the future, once eulachon populations have recovered. Musqueam Indian Band identified the site could potentially support other traditional or contemporary Musqueam fishing practices (i.e., fish weir, sturgeon fishing or beach seine). This is because the site features a continuous shallow sandy bottom, which is a feature rarely available elsewhere in Musqueam's territory in a location suitable for fishing. Musqueam stressed the importance of this site is linked to many factors, there is seasonal importance, but other factors contribute to the use of the site from year to year and this location can be, or could become, a critical access and use area. Musqueam expressed this location is intrinsically linked to Musqueam core stewardship, cultural continuity, and sense of place;
- Knowledge and Use LSA (an area defined in Musqueam, 2018 as the south arm of the Fraser River from Sand Heads to the Pattullo Bridge, including the "Project Jetty Footprint" as defined in the bullet above): 396 site-specific fishing values including key

fishing areas for various fish species, shellfish harvesting sites for crab, fish habitat (such as spawning and migratory routes), camping sites used by Musqueam Indian Band members while fishing, and processing sites where fish is smoked; and

- Knowledge and Use Regional Study Area (an area defined in Musqueam's 2018 KUS[209], as the north, middle and south arms of the Fraser River from the Salish Sea to the Pattullo Bridge, including the "Project Jetty Footprint" and the "Local Study Area", as defined in the bullets above): 526 site-specific fishing values including fishing sites for a variety of species, shellfish harvesting sites, processing sites for smoking, canning, filleting and vacuum packing fish, key habitat features (such as eulachon spawning areas and a herring migration route that is no longer active) and a camp used by Musqueam Indian Band members while fishing.

Access related concerns were assessed in three ways in the Musqueam Marine Traffic Study[215]. The first component related to cumulative effects which contributed to baseline impact on access to species such as crab, prawn and salmon fishing opportunities, broader development patterns in the region and recent Musqueam Indian Band use of marine resources. The second component focused on the impact of recent marine vessel traffic on fishing access, using data for known fisheries openings and positional data by DFO. The third component focused on the relationship between varying levels of recent marine vessel traffic and restrictions on access[215].

Musqueam's 2018 Marine Traffic Study identified "high conflict areas" where there is overlap between fishing locations and high use by marine traffic[215]. Musqueam Indian Band knowledge holders note that important fishing locations tend to overlap with high traffic areas due to their unique environmental characteristics, which create favourable habitat for salmon and eulachon as a holding area[215].

Musqueam Indian Band identified areas where the level of exclusion from access to fishing is highest, including the Fraser Surrey Docks, Tilbury Island, and other areas in the lower Fraser River. Musqueam Indian Band report that exclusion from fishing varies by location and target species and is predicted to be more frequent because of TMJ. Musqueam Indian Band reports that they have high confidence that even with mitigation, there will be substantial exclusion effects occurring in the vicinity of the TMJ site, which is also a Musqueam preferred fishing area. Based on the description of the Marine Safety Protocol provided by TJLP during Application Review, the EAO understands that Indigenous harvesters and mariners may enter or pass through the marine terminal area, but the EAO has taken a conservative approach in the impacts assessment and assumed that Indigenous harvesters would avoid entering and remaining in the marine terminal area due to the warning signs and notifications regarding elevated public risk, in particular when vessels would be berthing, loading, or de-berthing at TMJ.

Musqueam Indian Band members who seek to fish in the shipping channel, and downstream and upstream from the TMJ site may be restricted by construction and TMJ-related marine traffic. These access restrictions can potentially alienate Musqueam Indian Band members from important places and from activities that are fundamental to Musqueam Indian Band culture, rights, and identity[209]. As mentioned above, Musqueam Indian Band also identified concerns that increased vessel traffic associated with the BVS may lead to greater exclusion of Musqueam fishers from the Project area.

14.4.3.1.3 Potential Impacts to the Social, Cultural, and Experiential Aspects of Fishing

The Knowledge and Use Study describes the integral role that fishing plays to Musqueam Indian Band culture, which is also discussed in Impacts on Cultural Continuity section below. For instance, Musqueam Indian Band identity is linked to sharing fish with friends and family and being able to obtain and provide resources[209]. The report further describes fishing for others and sharing the catch as an activity that enhances self-worth, creates cultural pride, and builds social connections and respect among community members. These benefits ultimately strengthen Musqueam Indian Band cultural resilience and further enable Musqueam Indian Band traditions such as community engagement, knowledge transmission, ceremonies, and gatherings. The report furthers that while intangible, norms and social bonds are enabled by having adequate and accessible fish stocks.

Fish resources are also critical for Musqueam Indian Band ceremonies, principles, norms, community gatherings, protocols, and values – and ultimately, impacts to fishing could also have indirect effects on the transmission of knowledge in these linked domains. Musqueam Indian Band has also stated that its opportunities to teach on and off the river have been severely affected by low populations of preferred fish species. TMJ's potential effects on fish populations, including fish behavior, could only serve to exacerbate them[209]. The report furthers that any loss of resource access, quality, or quantity could affect the social fabric of the Musqueam Indian Band culture and community. Musqueam Indian Band informed the EAO that in the MSA area, if Musqueam Indian Band fishers are required to relocate to avoid large vessels, the loss of the opportunity to fish and transfer knowledge cannot be effectively replaced. Musqueam Indian Band explained that these disruptions would impact Musqueam Indian Band's cultural continuity, as they would impede the knowledge transfer and sense of place associated with the exercising of Musqueam Indian Band's Aboriginal fishing rights. Musqueam Indian Band also discussed the possibility of TMJ causing emotional and psychological stress by affecting factors such as: river access; opportunities for the preparation and consumption of traditional foods; safety in the shipping channel; the opportunities for social bonding; opportunities to engage in traditional activities; and the ability to meet cultural norms.

Musqueam Indian Band noted that TMJ could cause an increased disruption of Musqueam Indian Band members' sense of place, identity, and increased disconnection from Musqueam cultural heritage due to direct and indirect effects on fishing, ceremonies, gatherings, and consumption of traditional foods, and other cultural practices. Musqueam Indian Band identified concerns about TMJ impacts on cultural continuity, sense of place and Musqueam fishing and the impact on transmission of knowledge through habitat disturbance, access restrictions, and disturbances to quality of time spent on water[209]. In addition to the impacts of reduce time on the water, Musqueam Indian Band also identified that impacts to fishing also affect activities associated with fishing (e.g. processing fish and canning), which also disrupts the Musqueam knowledge transfer that would occur at these times, related to Musqueam culture, territory, practices, history, and hən̓q̓əmin̓əm̓. Musqueam Indian Band also noted potential increased psychological and emotional stress from uncertainty over TMJ effects (e.g., reduced safety from marine traffic, disruptions to fishing, accident and spill potential); and increased disruption to the protection, persistence, and living of Musqueam Indian Band *šxʷtəhiṁ* (i.e., ways, manners, and customs) and *snəẇeyəɬ* (i.e., teachings received since childhood, including identity and responsibilities) from TMJ construction and operations. The EAO is also aware that Musqueam Indian Band is concerned that the increased vessel traffic associated with the BVS near Tilbury Island might surpass members' comfort threshold resulting in severe impacts for the quality of Musqueam's experience while undertaking rights-based activities and impact Musqueam's sense of place and identity.

Musqueam Indian Band also identified concerns that TMJ would impact *q̓əlɬaləməcən* (Orca), especially SRKW, which have an important role in the ecosystems of Musqueam territory. Musqueam Indian Band described that SRKW has a tangible impact on Musqueam fishing practices and transmission of knowledge, since SRKW can affect the timing of fish running up the Fraser River, which directly alters the timing of Musqueam fishing opportunities. More, broadly *q̓əlɬaləməcən*, are also an important predator in the ecosystem and play a role in controlling the populations of other marine mammals, such as seals and sea lions, which directly affects abundance of fish in the Territory for Musqueam fishers and can alter the availability of preferred fishing locations. More information related to Musqueam's cultural and spiritual interests in *q̓əlɬaləməcən* are provided in the sections on Cultural Continuity and Sense Place and Identity below.

14.4.3.1.4 Conclusion

The EAO predicts that TMJ alone would have a **moderate** impact to Musqueam Indian Band's right to fish. In consideration of the available information, the EAO's consultation with Musqueam Indian Band, Musqueam Indian Band's engagement with TJLP, TJLP's commitments, the EAO's proposed EAC conditions if an EAC is issued and the recommended KMMs under

CEAA 2012, the EAO concludes that TMJ-related effects combined with cumulative effects is expected to result in a **moderate-to-serious** impact on Musqueam Indian Band's right to fish. The EAO predicts that TMJ would interact with current baseline levels of cumulative effects that already have a combined negative impact to Musqueam Indian Band's resource availability, access to fishing areas and the experience of fishing in the lower Fraser River and to a lesser extent in the Salish Sea. These cumulative effects are compounded by the importance of the site and the lower Fraser River for Musqueam Indian Band's Cultural Continuity and Sense of Place and Identity, limited seasonal opportunities for Musqueam Indian Band's salmon harvesting, importance of salmon to Musqueam Indian Band's culture, and incompatibility of drift net fishing and TMJ-related vessel activities in a relatively confined and heavily utilized marine environment, which increase the seriousness of impact of on Musqueam Indian Band's right to fish.

The EAO considered Musqueam Indian Band's perspectives on cumulative effects and Musqueam Indian Band's ability to meaningfully practice their fishing rights in the lower Fraser River and MSA area. The EAO acknowledges that there are already vessels transiting the lower Fraser River which can impact Indigenous fishers' access to and quality of experience of fishing. The EAO understands that shipping-related access disruptions and concerns about safety currently contribute to reduced opportunities for cultural transmission while undertaking traditional harvesting activities. While the EAO recognizes there is some uncertainty when considering how cumulative effects impact Aboriginal Interests, the EAO agrees with Musqueam Indian Band, that any increase in vessel traffic at the lower Fraser River would potentially be more serious when combined with past, present, and reasonably foreseeable activities.

The EAO understands that, though Musqueam Indian Band does not agree with the EAO's conclusions that TMJ would not have significant adverse residual effects or significant cumulative effects on Fish and Fish Habitat (Section 5.6.6), Musqueam Indian Band does agree with the EAO's conclusion that the consideration of cumulative effects increases the severity of impacts on Musqueam's fishing rights. The EAO heard that Musqueam Indian Band face an unprecedented challenge with record low salmon returns in recent years, as affirmed by the recent decision to implement long-term commercial closures and a License Retirement Program for Pacific Salmon.

The EAO heard from Musqueam Indian Band that at this critical juncture, Musqueam Indian Band, through its role as stewards of the Fraser River and their traditional territory, are working to preserve and restore the territory to provide adequate access to these resources for future Musqueam generations. Musqueam Indian Band noted that additionally, given the severity to salmon stocks more generally, it is important to note that these conditions are rapidly evolving and that other species (i.e., Eulachon or Sturgeon) may be targeted in the

future. Musqueam Indian Band consider in this context, the severity of both TMJ-specific and cumulative impacts to Musqueam's cultural continuity are significantly increased.

In Musqueam Indian Band's view, a full regional cumulative effects assessment of the lower Fraser River is necessary to fully understand the impact of project approvals on Musqueam Indian Band's fishing rights from cumulative impacts on fish and fish habitat and Musqueam Indian Band's access. Musqueam Indian Band told the EAO that in this context, Musqueam Indian Band has worked collaboratively with TJLP to mitigate impacts and determine appropriate accommodation. Therefore, as outlined in Musqueam Indian Band's September 21, 2021, letter to the Minister of Environment and Climate Change Strategy and the Minister of Transportation and Infrastructure, that subject to satisfactory finalization of conditions and mitigation measures, Musqueam Indian Band is satisfied with the progression of the environmental assessment of TMJ and believes it is ready to proceed onto referral to the appropriate ministers. The EAO has considered a variety of information sources in support of its conclusions on the impacts to the right to fish, including the results of Part B, information in Musqueam Indian Band 2018 and Musqueam Marine Traffic Study, 2018 and information shared by Musqueam Indian Band over the course of the EA including through consultation. The key factors that were considered in support of the EAO's conclusion on the impacts to the right to fish are summarized as follows:

Biophysical:

- The EAO's conclusions in the Fish and Fish Habitat in Part B that TMJ would have potential to result in low magnitude residual effects to fish and fish habitat at the TMJ site, and low magnitude residual effects to sturgeon from vessel strikes. The EAO did not predict residual effects to fish in the MSA area;
- The lower Fraser River is highly industrial and the TMJ site is previously disturbed. The MSA area is a heavily utilized marine environment;
- Musqueam Indian Band told the EAO that the ability of Musqueam Indian Band to carry out their fishing rights with preferred fish species is already constrained under baseline conditions due, in part, to a decline in the recent past of fisheries resources;
- Musqueam Indian Band implement a self-imposed moratorium on sturgeon and practice innovative catch-and-release methods as a conservation approach; and
- Gillnetting, the preferred Musqueam fishing method is very sensitive to shipping interactions.

Geospatial (places, sites and access):

- Musqueam Indian Band has identified 54 site-specific fishing values within the KUS

Project Jetty Footprint;

- Musqueam Indian Band have identified that the TMJ site as a preferred fishing site due to its unique environmental characteristics, which makes it a productive salmon fishing area; There is potential for Musqueam Indian Band harvesters to rely on this site at certain times of the year or under certain scenarios;
- During construction, access to the TMJ site would be restricted for three years. During operations, Indigenous mariners and fishers would avoid entering and remaining in the marine terminal area due to the warning signs and notifications regarding elevated public risk, in particular when vessels would be berthing, loading, or de-berthing at TMJ;
- Musqueam Indian Band has indicated that TMJ will have a high likelihood of exclusion effects on Musqueam Indian Band fishers and that gillnet fishing in the river (i.e., drift net fishing) would be particularly vulnerable to interruptions or disruptions due to TMJ-related vessel operations (especially tug-escorted LNG carriers) due to limited navigational space in the river channel;
- Specific to the BVS there is potential for higher frequency of interactions to occur between TMJ-related vessels and Indigenous Groups engaging in vessel based FSC fishing in the lower Fraser River during FSC fishing windows.
  Musqueam Indian Band identified that the increased vessel traffic associated with the BVS near Tilbury Island might surpass members' threshold to visit the TMJ site.
- The EAO's conclusions in the Current Use chapter in Part B of this Report found that TMJ-related vessel transits would have negligible to low magnitude effect to access to fishing compared to baseline numbers of vessel transits, that could be experienced as higher in the Fraser River as a change from baseline compared to Salish Sea. This effect would be due to regularly occurring (i.e., on average one vessel call per day under the BVS) and short-duration vessel movements to pass through known fishing areas in the Fraser River and Salish Sea, which could cause negligible to low magnitude effects to access to fishing; and
- Musqueam Indian Band have stated that they currently fish in the TMJ area, and intend to do so in the future, and identified the general area around Tilbury Island as one of the areas in the lower Fraser River where existing levels of exclusion from access to fishing are the highest due to interactions with vessel traffic.

Social, Cultural and Experiential:

- As outlined in the noise and visual quality assessments in Part B, potential negligible to low magnitude impacts due to a change in noise and visual quality during construction and to changes in visual quality and potential concerns about safety during operations;

- Musqueam Indian Band have reported that the size and volume of current vessel traffic in their territory is already a safety concern and a deterrent to fishing, and TMJ-related vessels would contribute to this concern;
- Musqueam Indian Band has reported that fish (including salmon, sturgeon, and eulachon) has and continues to be an integral part of Musqueam Indian Band life, language, culture, and economic systems;
- Musqueam Indian Band informed the EAO that TMJ could impact their sense of place, identity and increase disconnection from Musqueam cultural heritage;
- Musqueam Indian Band indicates that changes to land, waters, and resources from urbanization, industrialization, and other manmade impacts create disconnects between individuals, their communal collective and connection to place, including the Fraser River, decreasing, for example their sense of place;
- Musqueam Indian Band, through its role as stewards of the Fraser River and their traditional territory, are working to preserve and restore the territory to provide adequate access to these resources for future Musqueam generations; and
- Musqueam Indian Band indicates that fishing opportunities are already highly limited as are opportunities for the transfer of knowledge. Musqueam Indian Band has reported that knowledge transmission is place-based and experiential. Loss of opportunities to access the land and its resources thus affects cultural knowledge transmission, which is core to cultural persistence.

Mitigations:

- Proposed mitigations for potential impacts to Musqueam Indian Band's right to fish, include mitigations to reduce impacts to noise and visual quality in the CEMP and OEMP as well as the recommended key mitigations under CEAA 2012, specifically the Fish Mitigations to Reduce Harm and Mortality, Fish Habitat and Offset Plan, Marine Communications Plan, Marine Access and Transportation Plan, and Vessel Traffic Management Plan.

B. POTENTIAL IMPACTS ON HUNTING, TRAPPING, AND GATHERING

The EAO's evaluation of potential effects on the right to hunt, trap, and gather considers impacts to biophysical components that may result in changes in harvestable resource quantity and quality, changes in access to hunting, trapping, and gathering sites, and changes to the experience of hunting, trapping, and gathering that are attributable to TMJ.

Musqueam Indian Band considers their rights to hunting and the collection of plants and medicines as highly diminished due to cumulative effects. Hunting is a described as a crucial activity to Musqueam cultural identity, although the opportunity to do so has been constrained due to development, administrative restrictions, and industrialization. The Knowledge and Use study describe Musqueam Indian Band's alienation from hunting and plant gathering in their core territory[209]. Musqueam Indian Band is still able to hunt waterfowl in specific locations; however, this practice is becoming less common due to toxicity concerns. Shrinking hunting areas are also occurring due to the mobile nature of birds. These factors contribute to Musqueam Indian Band concerns regarding future developments that would further affect waterfowl populations and hunting areas[209]. The lack of opportunity to hunt other species, such as ungulates, and other mammals does not indicate this practice is no longer culturally important, as the act of hunting itself continues to be a crucial aspect of Musqueam culture and identity[209].

In the MSA, waterfowl such as dabbling ducks, geese, and swans were reported as an important food source for the Musqueam Indian Band. Musqueam Indian Band previously reported hunting activity, including for ducks and geese, near the northernmost part of the international marine shipping lanes. Musqueam Indian Band reported harvesting harbour seal, sea lion, and porpoise, with seals harvested throughout the Fraser River Estuary, including all areas of the South Arm of the Fraser River and offshore of Steveston, Westham Island, and Brunswick Point. The MSA noted that Musqueam Indian Band is able to harvest seals and sea lions under a special DFO licence, however, they have noted that they prefer not to due to concerns regarding pollutants. Musqueam Indian Band have noted that they desire to resume harvesting seals and sea lions upon the resolution of contamination and conservation concerns.

Similarly, Musqueam Indian Band has experienced a lack of opportunities to collect plants in the KUS Study Area[209]. Many of the same causes that have limited Musqueam Indian Band's hunting opportunities also apply to gathering, including agriculture, residential development, foreshore development along the Fraser and invasive species issues. Only a few areas exist where plant species can be harvested in Musqueam Indian Band's core territory. The quality and quantity of these plants are often found to be insufficient or unsuitable for collection due to lack of privacy and cleanliness (especially critical for medicinal plants). Plants collected in the KUS Study Area traditionally provided a number of uses, including medicinal, ceremonial, artistic and subsistence. Plant harvesting involves a number of activities, including preparation and processing, alongside more intangible activities and values such as spirituality, social bonding, knowledge creation and teaching. In the MSA, kelp continues to be an important food and medicinal plant. Musqueam Indian Band reported they must now trade for it, either because it cannot be found or is avoided due to contamination concerns.

In the following analyses, the EAO considers the above information and Musqueam Indian Band's perspective in the analyses below, as well as mitigation measures that were identified in the Application, mitigation measures that were identified during Application Review, proposed conditions of the TOC and recommended KMMs under CEAA 2012.

14.4.3.1.5 Potential Impacts to Wildlife, Wildlife Habitat and Plants

Musqueam outlined a number of comments related to wildlife and wildlife habitat, including concerns related to effects of daytime and nighttime lighting on wildlife of importance.

In response to a Musqueam Indian Band request, TJLP provided supplementary information on the potential effects to Barn Owls, migratory birds, and the Little Brown Myotis bat. Based on this assessment TJLP committed to include suitable mitigations to address potential effects from habitat loss, noise, light, ship strikes, and barriers to movement for these species in their wetland and wildlife management plans.

As discussed in Section 13.3.2, during construction, site preparation and ground stabilization could result in direct loss of traditional use plants. Although traditional use plants were not observed within the Project Disturbance Area, baseline field surveys cannot determine their complete absence. In the Application, TJLP stated that a pre-construction survey of the Project Disturbance Footprint would be conducted to identify any potential traditional use plants prior to initiation of construction. Methods to protect, salvage and transplant those plants will be outlined in the vegetation management and wetland management component of the CEMP. TJLP also expects the wetland and riparian enhancement and restoration to expand the available habitat for these species. After considering the proposed mitigation measures, the EAO concluded that TMJ would result in a potential loss of wetland and riparian ecosystems. Considering the proposed mitigation measures and conditions, the EAO is satisfied that TMJ is not likely to result in significant adverse residual effects to the Vegetation VC.

14.4.3.1.6 Potential Impacts to Access and Use of the Area for Hunting, Trapping and Gathering

Musqueam Indian Band members have a strong desire to rehabilitate the environment to enable hunting throughout Musqueam territory in the future[209]. The EAO is aware that Musqueam Indian Band has identified a concern through its review of TJLP's BVSA Report that increased vessel traffic under the BVS has the potential to impact Musqueam's ability to undertake other rights-based activities, including hunting, gathering, and trapping in the area. Musqueam Indian Band has identified that the construction of the TMJ project continues the trend of development in Musqueam territory and potentially reduces the ability to restore adequate access and habitat to support hunting, trapping, and gathering activities in the future.

The EAO notes that traditional use plant collecting areas were not identified on Tilbury Island and no traditional use plants were observed within the TMJ site. As discussed above, Musqueam Indian Band reported a lack of opportunities to collect plants in the Knowledge and Use Study Area. The EAO acknowledges there is a potential for traditional use plants to be present on Tilbury Island in the future. Given the current levels of harvestable resources for hunting, trapping, and gathering within the TMJ site, of which the upland portion is situated on fee simple (private) land, the EAO cannot discern that TMJ would have a measurable effect on access to areas used for hunting, trapping, and gathering by Musqueam Indian band. As described in Section 13.3.2, the EAO did not identify any changes to relevant pathways of effects to Aboriginal Interests related to the Wildlife, Wildlife habitat, and Marine Birds VC.

14.4.3.1.7 Potential Impacts to the Social, Cultural, and Experiential Aspects of Hunting, Trapping and Gathering

Hunting is a highly social event for Musqueam Indian Band members, from the transmission of hunting knowledge to the distribution and consumption of hunted products, including at community gathering.

As outlined in Air Quality, Water Quality and Current Use of Lands and Resources for Traditional Purposes sections of Part B, the EAO is of the opinion that TMJ-induced changes to air quality, water quality respectively are negligible to low magnitude and as such are unlikely to materially affect the experience of hunting, trapping, and gathering. Nevertheless, the EAO acknowledges that some Indigenous people may have existing concerns about consuming harvested resources from their territory and that additional development would likely increase those concerns with potential effects to the experience of hunting, trapping, and gathering. The EAO proposes light management, noise management and air quality management components of the CEMP and OEMP to reduce the impacts of visual, noise and air quality impacts to the experiential aspects of hunting, trapping and gathering at the TMJ site.

14.4.3.1.8 Conclusion

In consideration of the available information, the EAO's consultation with Musqueam Indian Band, Musqueam Indian Band's engagement with TJLP, TJLP's commitments, the EAO's proposed EAC conditions if an EAC is issued and the recommended KMMs under CEAA 2012, TMJ is expected to result in a **negligible** impact on Musqueam Indian Band's right to hunt, trap and gather.

The key factors that were considered in support of the EAO's conclusion on the impacts to the right to hunt, trap and gather are summarized as follows:

Biophysical:

- The EAO's conclusions at the TMJ site on adverse residual effects to Wildlife and Wildlife Habitat and Vegetation (see respective chapters in Part B) indicate negligible to low magnitude residual effects on loss or alteration of wildlife habitat, sensory disturbance from noise and light, and mortality; as well as low magnitude residual effects on wetland and riparian ecosystems;
- The EAO's conclusions in the MSA area on adverse residual effects to Marine Birds (see Wildlife section in Part B) indicate negligible to low magnitude residual effects related to mortality of marine birds; and
- Musqueam Indian Band reported historically hunting terrestrial and marine mammals and birds, such as deer, elk, waterfowl and whales throughout their territory, and harvesting kelp, broad leaf maple, yew, alder and Western red cedar, root plants, raspberries, berries, camas, salal and medicinal plants such as hemlock and wild licorice.
- Musqueam's intends to restore future opportunities to hunt, trap and gather in Musqueam territory and have identified that TMJ potentially reduces the ability to restore adequate habitat to support hunting, trapping, and gathering activities in the future.

Geospatial (places, sites and access):

- Musqueam Indian Band reported that it is currently limited in their hunting, trapping or gathering ability in the area due to existing development;
- Musqueam's intends to restore future opportunities to hunt, trap and gather in Musqueam territory and have identified that TMJ potentially reduces the ability to restore adequate access to support hunting, trapping, and gathering activities in the future.
- Musqueam Indian Band identified hunting historically throughout their territory, including Douglas Island and marshes in Richmond, and within areas of Metro Vancouver (e.g., Burns Bog). Plants collected in the Knowledge and Use Study Area traditionally provided a number of uses, including medicinal, ceremonial, artistic and subsistence. Traditional use plant collecting areas were not identified on Tilbury Island;
- Construction (just over three years in duration) and operation (30 years) is unlikely to cause disruptions to Musqueam Indian Band's access to areas traditionally used for hunting, trapping, and gathering activities at the TMJ site or in the MSA area;
- The upland portion of the TMJ site is situated on fee simple (private) land; and

- For harvesting of marine species from the water, the small number of TMJ-related vessels relative to current vessel traffic are predicted to have a negligible effect in terms of access.

Social, Cultural and Experiential:

- Potential impacts to experience in the vicinity of the TMJ site and along the shipping route due to a change in noise and visual quality during construction and operations which are anticipated to be negligible to low in magnitude in the Fraser River and Salish Sea.

Mitigations:

- Proposed conditions to mitigate impacts to Musqueam Indian Band's right to hunt, trap and gather are the Vegetation and Wetland Management and Wetland Offsetting Plan, and the wildlife and wildlife habitat management, light management, and noise management components of the CEMP and OEMP, all of which would require consultation with Indigenous Groups. The EAO is also proposing these mitigations as KMMs under CEAA 2012 which would include the requirements for migratory birds, lighting, noise and wildlife and wildlife habitat management and monitoring, and a Wetland Compensation Plan; and
- All vessels would adhere to the Marine Regulations and Legislation regulating vessel noise and lighting.

Musqueam Indian Band identified that it understands that the EAO has reached a conclusion regarding TMJ-specific impacts to hunting, trapping, and gathering based on conditions today, but Musqueam must reiterate that the construction of the TMJ project continues the trend of development in Musqueam territory and potentially reduces the ability to restore adequate access and habitat to support these rights-based activities in the future. Musqueam Indian band identified that existing impacts have already severely alienated Musqueam from their territory and degraded Musqueam's ability to practice rights-based harvesting. In Musqueam's view the EAO only acknowledges Musqueam's intent to restore future opportunities to hunt, trap and gather in Musqueam territory in its conclusions on TMJ but the EAO does not assess the impact of the project on Musqueam's potential future use.

The EAO also heard that additionally, Musqueam are continually working on restitution of habitat and restitution of harvesting opportunities. As such, Musqueam has a primary goal to acquire land and restore habitat to a degree that future hunting, trapping, and gathering opportunities are re-established. Musqueam told the EAO that with this context in mind, Musqueam has worked collaboratively with TJLP to mitigate impacts and determine appropriate accommodation. Therefore, as outlined in Musqueam Indian Band's letter, subject

to satisfactory finalization of conditions and mitigation measures, Musqueam is satisfied with the progression of the environmental assessment of TMJ and believes it is ready to proceed onto referral to the appropriate ministers.

POTENTIAL IMPACTS ON CULTURAL CONTINUITY & SENSE OF PLACE AND IDENTITY

Cultural Continuity and Sense of Place and Identity are important Musqueam values, and the following sections in *italics* were written by Musqueam Indian Band in their own words. The EAO appreciates that Musqueam has provide information and examples about Musqueam cultural continuity and sense of place and identity in their own words to help the EAO and decision makers to better understand these core interconnected values and how these values may interact with potential impacts from TMJ. The EAO assessed potential impacts to Musqueam's cultural continuity and sense of place and identity as requested by Musqueam in the sections below. As previously described, the EAO has also included these two values in its assessment of TMJ's potential impacts to Musqueam Indian Band's rights to fish (section A above) and hunt, trap and gather (section B above).

INTRODUCTION – RELATIONSHIP BETWEEN CULTURAL CONTINUITY & SENSE OF PLACE AND IDENTITY

The purpose of this section is to assess the potential impacts of TMJ on Musqueam's cultural continuity and sense of place and identity. To adequately understand these values, it is necessary to understand their relationship to each other and to Musqueam's other rights-based value components and activities. To this end, this section uses q̓əlɬaləməcən *(orcas) and Musqueam fishing practices as illustrative examples to outline these relationships. It is important to consider multiple examples to clarify that these concepts are applicable to more than the examples provided. The potential impacts on cultural continuity and sense of place and identity are assessed separately to ensure distinct impacts are identified.*

Musqueam's cultural continuity and sense of place and identity are crucial aspects of Musqueam culture and well-being which are foundational and inter-related; sense of place and identity is not possible without cultural continuity and cultural continuity is not possible without sense of place and identity. Both are directly tied to the land, waters, and resources of Musqueam's territory, and as a result, impacts to any valued component (i.e., harvesting, marine access, socio-economic impacts) threaten cultural continuity and sense of place and identity. Thus, understanding the nature of cultural continuity and sense of place and identify is vital to understanding all impacts to Musqueam Aboriginal Interests. Importantly, cultural continuity, sense of place and identity, and fishing were identified by Musqueam in their Knowledge and Use Study as the three rights-based Valued Components relating to Musqueam knowledge and use that may be impacted to a substantial degree by TMJ. While they were

separated into distinct categories for the purpose of the knowledge and use study, it's important to understand that they are heavily inter-related.

Musqueam is at a critical time for supporting and promoting cultural continuity as a generation of knowledge holders ages while current and ongoing opportunities for these knowledge holders to engage in the transfer of knowledge with younger generations is threatened by reduced access to important locations, experiences, and cultural practices. Sense of place stems from being in the environment and being able to experience a connection to the lands and waters that is uninterrupted by external stressors and annoyances and unimpeded by access constraints. Sense of place is also reinforced in a multi-generational way; ideally knowledge holders and younger Musqueam members participate in cultural activities (i.e., fishing) in the broader territory which reinforce sense of place, and by extension promote and support cultural continuity. Every aspect of Musqueam's lived environment is a mnemonic device for aspects of Musqueam's sniẇ *(teachings) and* sχʷəy̓eḿ *(ancient histories), further reinforcing the relationship between sense of place and identity and cultural continuity.*

For the purposes of the assessing impacts on Musqueam's Aboriginal Interests it may be useful to understand cultural continuity and sense of place and identity as distinct concepts that can be impacted differently by project-related activities. However, for Musqueam, these concepts are inseparable from Musqueam's distinct way of life and they rely on and re-enforce each other through the active practice of Musqueam culture, including harvesting, using həńq̓əmiṅəḿ*, navigating the territory, sharing* sniẇ *(teachings) and* sχʷəy̓eḿ *(ancient histories), and fulfilling the responsibility to be stewards of the territory. Just as these concepts are Inextricably interrelated, impacts on them are as well. There is both negative and positive feedback loops that are reinforced when these practices are disrupted or practiced. Musqueam values and way of life, including fulfilling Musqueam's responsibilities as stewards of their traditional territory rely on maintaining cultural continuity and sense of place and identity.*

q̓əlɬaləməcən (ORCAS) EXAMPLE TO DEMONSTRATE PROJECT IMPACTS ON CULTURAL CONTINUITY AND SENSE OF PLACE AND IDENTITY

For Musqueam, q̓əlɬaləməcən *(orcas) and specifically the SRKWs, are a culturally and spiritually significant species through their importance to Musqueam's Cultural Heritage and Current Use of Land and Resources for Traditional Purposes. SRKW are intrinsically tied to the Musqueam's cultural continuity and sense of place and identity. They have an important role in Musqueam's oral histories and traditions, including songs and artwork, which are essential for cultural wellbeing. For Musqueam people the songs, artworks and the* q̓əlɬaləməcən *(orcas) themselves provide cues for sharing knowledge and are tools for teaching Musqueam's culture and language. Impacts on SRKW and their potential loss disrupts cultural continuity, as it takes only a couple of generations to move from histories to stories.*

SRKW and ḳəlɬaləməcən *(orcas) role in Musqueam's sense of place and identity is tied to the way Musqueam people understand both ḳəlɬaləməcən (orcas) and their own relationship to the territory. From Musqueam's perspective, it can be difficult to separate SRKW, as a separate valued component, from the other interrelated elements of Musqueam territory. Musqueam people see themselves as belonging to the earth, as a child belongs to their mother, which comes with a responsibility for care that extends to SRKW, salmon, sturgeon, eulachon and other species. For Musqueam, this care or stewardship responsibility carries its own cultural significance and contributes to Musqueam sense of identity.*

Furthermore, SRKW *and* ḳəlɬaləməcən *(orcas) are important to Musqueam's cultural continuity because of both their distinct role in the territory's ecosystems and their specific relevance to Musqueam culture. SRKW have an important role in the ecosystems of Musqueam territory, which has a tangible impact on Musqueam. SRKW can affect the timing of fish running up the Fraser River, which directly alters the timing of Musqueam fishing opportunities.* ḳəlɬaləməcən *(orcas), more broadly, are also an important predator in the ecosystem and play a role in controlling the populations of other marine mammals, such as seals and sea lions, which directly affects abundance of fish in the territory for Musqueam fishers and can alter the availability of preferred fishing locations. Not only is the ecosystem disrupted by the decline in SRKW, but their decline also disrupts Musqueam ability to transfer knowledge from one generation to the next when important features of the territory are no longer frequently present. This represents a key example of how an impact to one element of the environment or to one particular species has cascading effects on other elements of the territory, these combined impacts representing a direct threat to cultural continuity and sense of place and identity.*

The relationship between SRKW, fish, Musqueam's fishing practices, cultural continuity and sense of place and identity is one illustrative example of the deep intrinsic connects between these concepts for Musqueam.

FISHING EXAMPLE TO DEMONSTRATE PROJECT IMPACTS ON CULTURAL CONTINUITY AND SENSE OF PLACE AND IDENTITY

Musqueam's fishing practices also provide a clear example of the complex interdependence of Musqueam's Aboriginal rights, traditional practices and cultural continuity and sense of place and identity. Musqueam fishing, including harvesting of crab and other seafood, is both one of the clearest expressions of Musqueam culture and traditions and one that is most clearly impacted by the Project. The continuation of many Musqueam culture activities rely on both having sufficient fish and seafood for the community and participating in the act of fishing. Musqueam continues the practice of communally distributing fish to Musqueam families, particularly elders and others who are unable to fish. Having sufficient fish is also important for Musqueam ceremonies, such as funerals, and for maintaining protocols between families and

other nations. The act of fishing itself is essential for Musqueam's cultural continuity, as it creates opportunities for Musqueam members to share Musqueam history, practices and values and knowledge about Musqueam territory and its species. All aspects of Musqueam fishing, including harvesting, preserving, distribution, consumption and fisheries management, provide opportunities for cultural continuity and contribute to sense of place and identity. It is through consistent and regular repetition of these practices that Musqueam culture has been transmitted between generations for thousands of years. The continuation of these cultural practices and knowledge in turn supports the continuation of Musqueam fishing practices. Together Musqueam fishing, knowledge and other cultural practices sustain each other.

Cultural continuity is about ensuring the ability of future Musqueam generations to practice the Musqueam way of life. Taking this concept seriously requires considering the impacts projects have on Musqueam's future ability to exercise Aboriginal rights. As part of our stewardship responsibility, Musqueam is actively working to restore key populations, such as sturgeon, eulachon, clams and oysters, to a condition where they can be harvested again. If harvesting sites, such as tidal flats for harvesting clams, are destroyed while populations are recovering, it will not be possible to restore traditional harvesting practices at these locations. Activities practiced in specific locations often have specific knowledge tied to them, including about the territory (timing, seasonality and movement of species), history and həńqəmińəm̓*. Ending a practice at an important location therefore risks losing the knowledge associated with it.*

There is also a deep relationship between Musqueam's fishing practices and sense of place and identity. Musqueam sense of place and identity is tied to the ability to access fish and resources from traditional territory, as this is part of what it means to be xʷməθkʷəy̓əm*. The act of fishing is also one of the primary ways Musqueam people navigate, experience, and maintain knowledge about their territory. Actively maintaining this knowledge is particularly important as projects continue to alter the territory, river geomorphology, fish behavior and resource abundance. Musqueam's traditional ecological knowledge is not static but is learned and maintained though lifetimes of practice throughout the territory. The loss of fishing opportunities, therefore, also impacts the ability to maintain sense of place and identity. In turn, maintaining this sense of place and identity is important for ensuring Musqueam people, including future generations, continue fishing and associated practices.*

In other words, any disruptions to Musqueam fishing, including from the Project, will impact Musqueam's cultural continuity and sense of place and identity. At the same time, disruptions to Musqueam's cultural continuity and sense of place and identity are likely to impact the efficacy and safety of Musqueam fishing activities. A more thorough analysis of impacts to Musqueam fishing is provided above in Section 14.5.3.A. It is important to re-emphasize that the concepts

outlined here about fishing are also true of many of Musqueam's other traditional practices, including plant harvesting and waterfowl hunting.

In summary, to adequately understand what cultural continuity and sense of place and identity mean to Musqueam, it is essential to understand how fundamentally interrelated these concepts are to each other and to other VCs, such as fishing and ḳəlɬaləməcən *(orcas). However, it is also important to understand the distinct impacts the Project may have on both valued components. Therefore, the following sections separately assess the potential impacts of the Project on Musqueam's cultural continuity and sense of place and identity.*

C. POTENTIAL IMPACTS ON CULTURAL CONTINUITY

In the Musqueam 2018 Knowledge and Use Study, Musqueam Indian Band stated that their ability as a people and a culture depends on the ability of members to transmit and share their knowledge[209]. This includes knowledge of places and practices, as well as the *həńq̓əmiń əm̓* language, which is tied to the knowledge and practices across the landscape (for example, through place names, mnemonic devices for stories, histories, and genealogies).

Musqueam Indian Band has identified the area surrounding the TMJ as a place where teaching actively occurs. Musqueam Indian Band teaching and learning models are activity-based and depend on multisensory interactions with the landscape. Musqueam Indian Band noted those teaching moments are often spontaneous and unscripted and arise from opportunities to practice traditional activities in the company of someone who is more experienced or knowledgeable. This is a life-long and iterative process that requires repeated exposure to understand seasonal and year-over-year differences in resource availability. Musqueam Indian Band also noted that knowledge transmission requires the participation and the experience of numerous individuals, and that the diffusion of knowledge within the community builds social cohesion[209].

Snəẇeyəɬ (teaching) also include *šxwtəhiṁ̓* (beliefs, ways, manners, and customs) and Musqueam Indian Band identity, including rights, responsibilities, and what distinguishes Musqueam Indian Band from others. Musqueam Indian Band stated that abundant and high-quality resources are vital to the transmission of knowledge, but this is becoming increasingly difficult due to cumulative effects to resources within Musqueam Indian Band's territory. Similarly, resources must also be accessible to facilitate knowledge transmission, and Musqueam Indian Band emphasized the importance of navigation on the Fraser River, including access to areas, the quality of the access, and adequate time to teach. Musqueam Indian Band reported that their cultural continuity continues to be affected by government legislation and policies, including the reserve system, residential schools, and restrictions to resources. Musqueam Indian Band noted that impacts to members' ability to engage in traditional

resource use leads to an erosion of knowledge, teaching capacities, and opportunities for teaching and learning.

14.4.3.1.9 Potential Impacts to Access and Use of Key Cultural Areas resulting from the Project

In its 2018 Knowledge and Use Study, Musqueam Indian Band outlined a number of site-specific values related to Cultural Continuity in the Knowledge and Use Study Area, as described below [209]:

- Knowledge and Use Study Project Jetty Footprint: nine site specific values including: teaching areas; important fishing locations; a water route; high value fish habitat and spawning locations; hunting and trapping areas; habitation sites; and a spiritual site;
- Knowledge and Use LSA: 61 site-specific values, including: culturally significant sites and travel routes along which Musqueam Indian Band members pass on intergenerational teachings on traditional harvesting, particularly fishing, hunting, crabbing, and food plant gathering; sites where Musqueam Indian Band members have gathered to pass along oral histories and teachings, including a site containing Musqueam belongings; and
- Knowledge and Use Regional Study Area: 86 site-specific values including areas used for the intergenerational transmission of knowledge related to fishing, hunting, plant gathering, and processing activities such as smoking and drying fish, and water routes travelled by members to access Musqueam Indian Band territory.

Musqueam Indian Band identified the following potential TMJ interactions with their cultural continuity:

- *"Increased interruptions to knowledge transmission and lost opportunities to transmit knowledge due to loss of access and use of the* [Knowledge and Use] *Study Area and from construction and operation activities, including the additions of in-water infrastructure and increases in marine vessel traffic;*
- *Increased interruptions to knowledge transmission and lost opportunities to transmit knowledge due to the compounding effects of industrial development projects, urbanisation, and environmental stressors on the resources, lands, and waters in the vicinity of the Project;*
- *Increased interruptions to knowledge transmission and lost opportunities to transmit knowledge due to rapid environmental change caused by Project activities, rendering Musqueam knowledge outdated;*

- *Increased interruptions in knowledge transmission and lost opportunities to transmit knowledge due to avoidance of, and alienation from, the* [Knowledge and Use]*Study Area as a result of increases in marine traffic, hydrological and ecological changes, and noise disturbances; and*
- *Increased disruption to knowledge transmission due to Project restrictions that reduce Musqueam members' abilities to freely access preferred resources and waters in the* [Knowledge and Use] *Study Area."* [209](p. 3, 59, 115);
- Increased disruption of knowledge transmission as a result of decreased opportunities to undertake communal activities associated with fishing, hunting, and harvesting, including processing, storing, and distributing resources; and
- Musqueam Indian band identified that Impacts on SRKW and their potential loss disrupts cultural continuity, as it takes only a couple of generations to move from histories to stories and the decline in SRKW disrupts Musqueam ability to transfer knowledge from one generation to the next when important features of the territory are no longer frequently present.

Musqueam Indian Band described the importance of being on the land to teaching and learning of community members. A large amount of cultural knowledge relates to the lower Fraser River, which includes the Knowledge and Use Study Area. The Fraser River is used as a classroom, where knowledge is taught and built through experience[209]. Knowledge transmission depends on time, in that reiteration and exposure are necessary elements for it to occur. Knowledge transmission also depends on healthy resources, through both sharing information about traditional foods, including how to obtain and process them, and also through sharing the actual foods. Due to this, fewer resources can mean fewer opportunities to learn about obtaining these resources. Musqueam Indian Band noted that learning through direct experience can be lost when resources are depleted, for example, when certain salmon runs have been too low to fish, it has deprived Musqueam Indian Band members (especially younger generations) for the opportunity for learning and cultural continuity.

Knowledge transmission depends on a number of key factors, such as access to the land, resources and time, and impacts to any of these factors can have adverse effects on cultural persistence[209]. Many interconnections exist between access restrictions and environmental change and effects on knowledge transmission. Musqueam Indian Band also identified impacts to knowledge transmission and cultural continuity occurring through impacts to the Musqueam VC for fishing, which are described in the "Cultural Continuity" section below.

Musqueam Indian Band notes that TMJ could result in increased gaps in knowledge from lost opportunities (decreased availability of resources) to transmit knowledge due to TMJ activities. With respect to the importance of access and use of key areas and resources, please refer to

the above sections discussing potential impacts of TMJ on fishing, hunting, and trapping, and gathering and the section below which discusses potential impacts of TMJ on Musqueam Indian Band's proven and asserted Aboriginal rights and title.

Musqueam Indian Band identified concerns regarding potential decreased access, change in quality of access, and use of key areas for cultural continuity as a result of TMJ construction. Musqueam Indian Band noted that this could then contribute cumulatively to the multiple interacting factors that disrupt and reduce knowledge transmission that is essential to the maintenance of Musqueam Indian Band's social connections, member identities, and cultural wellbeing.

TJLP has stated that TJLP's influence on TMJ-related vessel operations would be limited beyond TMJ's marine terminal area but is committed to adjusting their shipping schedule when safe and feasible to do so in order to reduce the likelihood of TMJ-related vessels interrupting FSC openings in the lower Fraser River. To avoid or reduce disruptions to marine access to the area, the EAO is recommending KMMs under CEAA 2012 for a Marine Access and Transportation Plan from the TMJ site to Sand Heads and a Vessel Traffic Management Plan for the shipping route until 12 nm. The Marine Access and Transportation Plan would include a description of mitigations to reduce disruptions caused by construction and operations for members of Indigenous Groups to carry out traditional use activities that have been identified and communicated by Indigenous Groups to TJLP in relation to this or other relevant plans. The Vessel Traffic Management Plan would include speed limits, where safe, within the Fraser River and MSA area, and commit TMJ-related vessels to following established shipping routes and maintaining a constant course. The EAO is also proposing Condition 17: Indigenous Cultural Awareness, Recognition and Mitigation, which would assist in mitigating impacts to cultural continuity and Musqueam Indian Band knowledge holders, by offering opportunities to Indigenous Groups to lead or support activities such as holding ceremonies, executing cultural protocols, transmission of knowledge or language, and recognizing cultural heritage.

14.4.3.1.10 Potential Impacts to Musqueam Experience of the TMJ Area

Musqueam Indian Band's 2018 Knowledge and Use Study outlines how TMJ (alongside other developments) could create gaps in knowledge in a short span of time[209]. Rapid change can create disconnects between Musqueam Indian Band members and rights-based practices and between generations of people. Similarly, changes to the environment can result in fewer direct experiences on the water, which can reduce how reliable current knowledge is.

Musqueam Indian Band also raised that the quality of the experience also depends on the availability of resources that make the experience possible. As discussed in the sections below, there is potential for changes to quality of experience while exercising traditional harvesting

activities, which could affect cultural continuity at important locations for Musqueam Indian Band. Noise, vibration, and changes to visual quality (daytime viewing and nighttime lighting) during construction have the potential to impact quality of experience, though these effects would be temporary and short-term in nature. As part of the Cultural Awareness, Recognition and Mitigation condition, Musqueam Indian Band would be involved to implement cultural practice, education, or recognition opportunity and associated activities. The EAO proposed several conditions such as the light management and noise and vibration management components of the CEMP and OEMP which would require consultation with Indigenous groups, which seeks to partially address these temporary, potential effects. The EAO is also recommending a Marine Access and Transportation Plan as a KMM under CEAA 2012 to reduce impacts to access from construction and operations.

14.4.3.1.11 Potential Impacts to Cultural Aspects of the TMJ Area

Musqueam Indian Band noted that one specific activity that could directly impact Musqueam Indian Band knowledge is dredging. Dredging has the potential to change how and what fish congregate in an area, how the river flows or where fish spawn. Interruptions to knowledge transmission are especially likely if TMJ-related environmental changes occur at the same time as access and use restrictions. Community members viewed TMJ as yet another threat to a central pillar of Musqueam Indian Band's cultural wellbeing[209].

Musqueam Indian Band identified concerns related to increased interruptions in knowledge transmission and lost opportunities to transmit knowledge due to avoidance of, and alienation from, the Knowledge and Use Study Area resulting from hydrological and ecological changes, marine traffic, and noise disturbances. The EAO proposes Condition 17: Indigenous Cultural Awareness, Recognition and Mitigation that would include a description of 1) a process for continuing engagement with Indigenous Groups to further identify and plan for opportunities for cultural awareness and recognition; 2) how opportunities for cultural awareness and recognition that have been requested by Indigenous Groups have been considered and supported by TJLP; and 3) the process of how Indigenous Groups will be involved in the implementation of cultural awareness and recognition activities. The EAO also proposes a condition for Indigenous Monitors that would require TJLP to offer opportunities for Involvement of Indigenous Groups in construction monitoring activities for activities that may affect Indigenous use and related environmental values. Similarly, several conditions and KMMs recommended under CEAA 2012 require the development of plans, these plans would also require the inclusion and consideration of any Indigenous knowledge that has been shared with TJLP. This would ensure that the management of TMJ-related effects allow for mitigation measures to be informed by traditional knowledge.

D. POTENTIAL IMPACTS TO SENSE OF PLACE AND IDENTITY

Musqueam Indian Band reported that for members, place names, heritage sites, ceremonies, gatherings, norms, protocols, social bonds, and use and travel of the Fraser River are fundamental to sense of place and identity[209]. Musqueam Indian Band consider Sense of Place and Identity to be highly connected to the other VCs of Fishing and Cultural Continuity, as well as other resource and land-based cultural activities, such as hunting and plant harvesting. Musqueam Indian Band noted that Sense of Place and Identity is distinct in that it describes specific kinds of relationships between people, and people and place, which depend on unique environmental and social factors which warrant discussion. Musqueam Indian Band stated that its culture is inseparable from the surrounding environment.

A key aspect of Musqueam Indian Band's sense of place is encompassed in *snəẁ eyəɬ*, which includes a person's understanding of their genealogy, rights, and responsibilities, and geographical, temporal and social space. Sense of place is also built from memories and experiences in a particular environment or space, as well as the presence of familiar and valued features. Sense of self is closely linked to place, in which people and environment are united as whole. The environment, place, identity and spirituality are interlaced and reinforcing. This holistic worldview is a pillar of Musqueam Indian Band identity, and ties in to Musqueam stewardship, as Musqueam Indian Band are the guardians for their ancestors and future generations[209]. Stewardship and being guardians of the salmon (and other resources) and the Fraser River are common Musqueam Indian Band values and have been for generations. Such norms and principles are a core part of many Musqueam members' ideas of self, community, and heritage. As a consequence, environmental degradation is in direct contravention of these ideals, and is harmful to Musqueam identities and emotional, spiritual, and psychological wellbeing.

Musqueam Indian Band reported that oral histories and historical experiences tell them who they are, where they come from, and their ties to their territory. In addition to these histories and experiences, a record of belongings (artefacts), and village and burial sites (archaeological sites) anchor Musqueam Indian Band sense of place and identity. Place names are tied to stories and spiritual sites, which form a network of 125 Musqueam Indian Band named sites linked by genealogy, history, story, cultural practice, teachings, and familial and community relationships[209]. Musqueam Indian Band told the EAO that SRKW have an important role in Musqueam's oral histories and traditions, including songs and artwork, which are essential for cultural wellbeing.

Musqueam Indian Band have noted that rapid industrialization and urbanization have drastically changed Musqueam Indian Band's territory, from its aesthetics, to the quality of access and use, to the abundance of resources, resulting in the loss of valued place

characteristics and disrupting Musqueam Indian Band members' connection to place. Landscape changes have left large parts of Musqueam Indian Band's territory inappropriate for ceremonial and cultural activities[209]. Musqueam Indian Band noted that psychological and emotional distress often accompanies disruptions to the water, the land, and its resources given the close affinity felt by Musqueam Indian Band towards the environment.

14.4.3.1.12 Potential Impacts to Cultural Heritage Resources and Sites

Heritage sites are discussed in the Knowledge and Use Report (Musqueam, 2018), as place names, camp sites and old village sites represent Musqueam Indian Band ancestral ties to the territory[209]. For instance, the named site of *ƛ̓əqtinəs* (or "long shore") is located across the Fraser River from the TMJ site. In addition, an old village site is located approximately five km upstream from the Project Jetty Footprint, known as *səẇq̓ʷeqsən*. Musqueam Indian Band stated that burials and belongings found within hints at the expansive historic use. As discussed in Section 13.2.3, the EAO notes that temporary interruptions to Indigenous access to known heritage resources are possible throughout construction and during operations since the EAO assumed that Indigenous mariners would avoid entering and remaining in the marine terminal area due to the warning signs and notifications regarding elevated public risk, in particular when vessels would be berthing, loading, or de-berthing at TMJ and during transit of TMJ-related vessels (LNG Carriers and Bunker vessels) through the Salish Sea and in the Fraser River. Based on the assessed magnitude of wakes attributable to TMJ-related vessels, impacts to cultural sites from wakes are not anticipated (see Vessel Wakes and Current Use of Lands and Resources for Traditional Purposes sections in Part B).

To ensure access to cultural and archaeological sites at the TMJ site are not disrupted during construction and operations, the EAO proposes a condition for a Cultural and Archaeological Resources Management Plan which would involve TJLP addressing Indigenous concerns around access, both in terms of ensuring Indigenous access to sites during construction and prohibiting unauthorized access by the public. The Heritage Resources chapter of Part B provides further details on the Cultural and Archaeological Resources Management Plan. The EAO notes that where intact or disturbed resources are found at the TMJ site, TJLP would be required to manage them in accordance with the HCA, employ a Chance Find Protocol and carry out all activities that would affect those resources in compliance with any permits issued for the HCA. The EAO also understands that Musqueam Indian Band also requires Musqueam Indian Band-specific permits for archaeological work, which would allow Musqueam Indian Band to input additional mitigations. The EAO is also recommending KMMs under CEAA 2012 for a Marine Access and Transportation Plan, which would identify the procedures of communication to Indigenous Groups and identification of mitigations to reduce disruptions to access caused by

Construction and Operations for members of Indigenous Groups to carry out traditional use activities.

14.4.3.1.13 Potential Impacts to Access to and Use of Cultural Sites and Areas

In the 2018 Knowledge and Use Study, Musqueam Indian Band outlined a number of site-specific values related to Sense of Place and Identity in the Knowledge and Use Study Area, as described below [209]:

- Knowledge and Use Study Project Jetty Footprint: Three site-specific values including a water route used to access Musqueam Indian Band's territory, camping sites, and a spiritually valued area for Musqueam Indian Band members;
- Knowledge and Use LSA: 151 site-specific values including temporary and permanent habitation sites used currently and historically (such as traditional harvesting camps, old village sites, and other areas habituated by Musqueam Indian Band members prior to reserves), historic burial sites, place names, ceremonial and spiritually important sites, and travel routes used by Musqueam Indian Band members to access their traditional territory; and
- Knowledge and Use Regional Study Area: 269 site-specific values including sites of ceremonial importance where Musqueam Indian Band members have hosted and attended various ceremonies (such as mask dance ceremonies, burnings, coming and age and naming ceremonies, weddings, and memorials), place names, locations of former and existing burial sites, other areas of historic importance (such as former battlegrounds, village sites, and a shell midden) and water routes used to access Musqueam Indian Band's traditional territory and for war canoe racing.

Musqueam Indian Band identified the following potential TMJ interactions with their sense of place and identity:

- *Increased disruption of Musqueam members' sense of place as a result of changes to valued places and place characteristics (e.g., from marine traffic, noise disturbances, and ecological changes);*
- *Disruption of Musqueam identities and increased disconnection from Musqueam cultural heritage due to direct and indirect Project effects on fishing, ceremonies, gatherings, and consumption of traditional foods, and other cultural practices;*
- *Increased psychological and emotional stress from uncertainty over Project effects (e.g., reduced safety from marine traffic, disruptions to fishing, accident, and spill potential); and*

- *Increased disruption to the protection, persistence, and living of Musqueam* šxʷtəhiṁ *(i.e., ways, manners, and customs) and* snəẇeyəɬ *(i.e., teachings received since childhood, including identity and responsibilities) as a result of Project construction and operations"* [209] (p. 79, 116).

As described in the 2018 Musqueam Indian Band's Knowledge and Use Study, one potential outcome of TMJ is avoidance of the TMJ site, as Musqueam Indian Band members may be deterred by construction noise and activity. This would be a more likely outcome for younger generations who are still learning to navigate the Fraser River and the presence of bigger ships could lead to further obstacles. This may also be the case for more experienced members who would also be barred from using parts of the Fraser River due to ship traffic and maneuvering and exclusion zones. As discussed in Section 13.3.1, the EAO acknowledges Indigenous concerns that noise and visual disruptions and concerns about safety could then lead to reduced opportunities for cultural transmission including Indigenous language acquisition by younger generations while undertaking traditional harvesting activities on land or on the water. To reduce this impact, the EAO is proposing Condition 17: Indigenous Cultural Awareness, Recognition and Mitigation, which would provide opportunities for Musqueam Indian Band to execute cultural protocols and transmission of knowledge or language.

Musqueam Indian Band's Knowledge and Use Study discusses pathways of interaction between TMJ and Sense of Place and Identity, including potential effects from marine traffic. Musqueam Indian Band noted that the potential for more traffic would mean more stress and less enjoyment on the water, including concerns for safety when on the water[209]. The report outlined that the current level of traffic in the area created a high level of disturbance, and additional vessels might surpass Musqueam Indian Band's threshold of comfort to visit the TMJ site. With respect to the potential effects of TMJ-related vessel traffic, as discussed in Section 13.3.1, the EAO acknowledges that Musqueam Indian Band's marine travel and traditional marine harvesting activities (fishing, crabbing, and other marine based gathering activities) could be affected periodically and for short terms by transiting TMJ-related vessels. The EAO is recommending KMMs under CEAA 2012 for a Marine Communication Plan and Marine Access and Transportation Plan which would identify the procedures of communication to Indigenous Groups and identification of mitigations to reduce disruptions caused by Construction and Operations for members of Indigenous Groups to reduce impacts caused by TMJ-related vessels.

14.4.3.1.14 Potential Impacts to Musqueam Indian Band's quality of experience of the TMJ area

As described in the 2018 Knowledge and Use Study, there are many facets and dimensions of sense of place and identity, including spatial, physical, emotional, symbolic, psychological, social, and activity-based dimensions[209]. These dimensions are developed over time through familiarity, shared experiences and cultural knowledge. Musqueam Indian Band described the intangible benefits of spaces that impart this sense of place and identity, including emotional and psychological benefits and social and cultural connections and wellbeing.

Emotional and psychological stress can sometimes occur alongside disruptions to resources, land and the water, which can have cross-generational effects[209]. The EAO understands TMJ could increase the disruption to Musqueam Indian Band members' sense of place in the TMJ area due to factors such as increased noise, increased marine traffic, and ecological and geographical changes. This could then lead to increased psychological and emotional stress from changes to physical and auditory landscape, and the deterioration of social relationships from the loss of access to that area. There would be the potential for changes to quality of experience which could affect sense of place and identity at important locations for Musqueam Indian Band. The EAO concluded that there would be a residual effect to noise during construction and decommissioning. Visual conditions during construction and operations could also affect the site. The EAO proposes a condition requiring the development of a noise management plan and lighting management plan as part of the CEMP and OEMP, in consultation with Indigenous groups, which seeks to partially address potential effects to the auditory and visual experience of the TMJ site. The CEMP and OEMP would also include component plans for vegetation and wetland management.

The EAO is also proposing a key mitigation under CEAA 2012 for a Marine Access and Transportation Plan, which would reduce impacts to users on the Fraser River to Sand Heads. The Plan would identify marine uses and navigation in the Project area, including fish harvest timing windows, methods to coordinate and communicated with other marine users, and mitigations to reduce disruptions for members of Indigenous Groups to carry out traditional activities, including fishing for FSC purposes that have been identified by Indigenous Groups. Although there are residual effects related to marine use, noise and vibration, and visual quality, all of these effects would be temporary and short-term in nature.

14.4.3.1.15 Conclusion on impacts to Cultural Continuity and Sense of Place and Identity

In consideration of the available information, the EAO's consultation with Musqueam Indian Band, Musqueam Indian Band's engagement with TJLP, TJLP's commitments, the EAO's proposed EAC conditions if an EAC is issued and the recommended KMMs under CEAA 2012,

the EAO is of the view that the concerns raised regarding potential TMJ related impacts on Musqueam Indian Band's cultural continuity and sense of place and identity have been adequately considered and addressed for the purpose of the EA.

The EAO understands that in Musqueam Indian Band's view, the existing cumulative impacts on Musqueam territory mean that additional impacts to Musqueam cultural continuity and sense of place and identity cannot be fully mitigated. The EAO heard from Musqueam Indian Band that impacts to their quality of experience and disruption of Musqueam's access and intergenerational knowledge transfer are inherent to TMJ's construction and operation.

Furthermore, in Musqueam Indian Band's view, the Crown's approach to this assessment has limited Musqueam's ability to effectively address impacts to Musqueam's cultural continuity and sense of place and identity. The EAO understands that Musqueam Indian Band consider both the unwillingness to include Musqueam-specific conditions and the lack of distinction between Indigenous Groups that assert Aboriginal rights and Musqueam, who have a proven Aboriginal Right and actively practice rights-based activities that will be impacted by TMJ, frustrate Musqueam's ability to ensure Musqueam-specific impacts are addressed during the assessment. The EAO heard from Musqueam Indian Band that this is unacceptable to Musqueam Indian Band for projects anywhere in Musqueam territory and Musqueam Indian Band expects the Crown to address these issues differently in future assessments.

The EAO heard that Musqueam Indian Band understand why the EAO has refrained from determining the significance on impacts to Musqueam's cultural continuity and sense of place and identity, given the limitations of the EAO's assessment methodology. However, the EAO also understands that Musqueam Indian Band do not think lack of an appropriate methodology equates with adequate consideration of impacts and hope to see this issue better addressed in the future. Musqueam Indian Band emphasizes that impacts to cultural continuity and sense of place are already severely impacted as Musqueam has been reterritorialized, alienated, and displaced from territory that is vital to Musqueam cultural continuity.

E. POTENTIAL IMPACTS ON TITLE

The assessment of impacts to Aboriginal title was informed by the relevant information presented above in the EAO's assessment of effects to VCs in Part B of this Report that informed the discussion of impacts to vegetation, wildlife, fishing, hunting, trapping, and gathering, and other traditional and cultural interests.

In considering potential impacts of TMJ-related activities on Aboriginal title claims within the vicinity of the TMJ-site, EAO has considered the following three components of Aboriginal title:

- Use and occupation: Consideration of potential alienation of an area, the degree of potential disturbance or functional effect of the potential disturbance associated with the Project, how the proposed decision might restrict community members' access to the area, and how the proposed decision might affect community members' enjoyment, experience, and use of the area, now and in the future;
- Decision-making: Consideration of whether the proposed decision would result in a new tenure or transfer of ownership to the area, the extent to which an Aboriginal community might be involved in the decision-making process, and whether the activity might be consistent/ inconsistent with any cultural/other objectives of the Aboriginal group for management in this area, now and in the future; and
- Economic benefits: consideration of whether the Project-related decision might affect a community's ability to derive direct and/or indirect economic benefits from the area, and how the proposed decision might affect a community's economic development aspirations for the area, now and in the future.

Musqueam Indian Band emphasizes the project is entirely within the unceded homeland and territory of the *xʷməθkʷəy̓əm* (Musqueam) people, within which Musqueam continues to hold title and rights. During the EA, Musqueam Indian Band raised concerns about the EAO's characterization of Aboriginal rights and title related to the village site in the draft assessment report for TMJ. To address these concerns, Musqueam Indian Band requested that the EAO include more information to appropriately contextualize claims and a deeper understanding of the familial ties and protocols that govern access to *ƛ̓əqtinəs* as provided in Musqueam's 2018 KUS study.

Musqueam Indian Band's 2018 KUS study states that old village and camp sites, such as *ƛ̓əqtinəs*, are a clear representation of Musqueam ancestral ties to the territory and are important spaces that connect Musqueam to their heritage[209]. Musqueam Indian Band's 2018 KUS study also identified that Musqueam and their neighbours and relations practiced a system of resource distribution based on bilateral kinship and descent, which provided people with opportunities to access a wide range of fishing, gathering, and hunting sites through both maternal and paternal lineages if they followed proper protocols[209]. Musqueam people arranged inter-village marriages based on this system to ensure access to resources, as well as

participating in feasts and ceremonies that involved the sharing of food and goods between families and villages[216].

Musqueam Indian Band also identified that Musqueam's Aboriginal title includes a legal interest in land, which encompasses inherent rights, powers, and responsibilities to govern over Musqueam territory – Central to this is decision making, which is reflected in the assessment report under "control of area." Musqueam Indian Band also consider, that in addition to the economic impact from Musqueam's loss of ability to harvest fish, TMJ would also prevent Musqueam from deriving economic benefits from future use of the impacted crown land, for at least the life of the project.

Potential TMJ impacts on Musqueam Indian Band title are assessed below.

14.4.3.1.16 Conclusion

In consideration of the available information, the EAO's consultation with Musqueam Indian Band, Musqueam Indian Band's engagement with TJLP, TJLP's commitments, the EAO's proposed EAC conditions if an EAC is issued, and the recommended KMMs under CEAA 2012 TMJ is expected to result in a **minor** impact to Musqueam Indian Band's Aboriginal title.

The EAO understands that that Musqueam is aware of, but does not agree with, the EAO's determination that TMJ will have **minor** impacts on Musqueam's Aboriginal title, based on its assessment of TMJ's impacts on Musqueam's use and occupation of the area, control of the area, and economic benefits. The EAO heard that Musqueam is already severely impacted by reduced access to both the broader territory and the project area in particular and related degradation of resources. As a result, Musqueam does not consider further impacts to Musqueam's use and occupation to have **minor** impacts on Musqueam's Aboriginal title. Musqueam Indian Band also views the EAO's approach to consultation as directly undermining Musqueam's ability to practice its governance, which also constitutes an impact on Musqueam's control of the area and Aboriginal title.

Nonetheless, it is within this context that Musqueam Indian Band has worked collaboratively with the proponent to mitigate impacts and determine appropriate accommodation. Therefore, as outlined in Musqueam Indian Band's letter, Musqueam Indian Band is satisfied with the progression of the Environmental Assessment of the Project and believes it is ready to proceed onto referral to the appropriate minister.

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[216] Suttles, Wayne. 1987. "The Persistence of Inter-village Ties among the Coast Salish." InCoast Salish Essays, pp. 209-230. Vancouver: Talonbooks.

The key factors that were considered in support of the EAO's conclusion on the impacts to Aboriginal title are summarized as follows:

Use and Occupation:

- Based on the description of the Marine Safety Protocol provided by TJLP during Application Review, the EAO understands that Indigenous harvesters and mariners may enter or pass through the marine terminal area, but the EAO has taken a conservative approach in the impacts assessment and assumed that Indigenous harvesters would avoid entering and remaining in the marine terminal area due to the warning signs and notifications regarding elevated public risk, in particular when vessels would be berthing, loading, or de-berthing at TMJ;
- The increase in vessel traffic along the Fraser River would be a small percentage increase from traffic already present; and
- Low magnitude noise effects at the village site of *ƛ̓əqtinəs* which is anticipated to be short-term in duration.

Control of Area:

- The area of development for the TMJ jetty is crown land (submerged);
- Musqueam Indian Band emphasizes that consultation on this project, has primarily involved solicitation of Musqueam feedback regarding what happens in an area more than a substantive role in decision-making;
- Musqueam Indian Band have identified that stewardship and being guardians of the salmon (and other resources) and the Fraser River is central to being Musqueam, noting that members are continuously innovating and taking measures to restore wild resources, including through selective fishing measures and self-imposed restrictions on harvesting;
- Historically Musqueam and their neighbours and relations practiced a system of resource distribution based on bilateral kinship and descent, which provided people with opportunities to access a wide range of fishing, gathering, and hunting sites through both maternal and paternal lineages if they followed proper protocols; and
- Musqueam Indian Band have identified Musqueam's Aboriginal title includes a legal interest in land, which encompasses inherent rights, powers, and responsibilities to govern over Musqueam territory and central to this is decision making and governance.

Economic Benefits:

- The upland portion of TMJ is located on fee simple private lands that were used for

industrial purposes

- The construction and operation in the water lot and the vessel traffic from TMJ in the Fraser River may have minor economic impacts on Musqueam Indian Band's harvesting of fish; and
- Musqueam consider that in addition to the economic impact from loss of ability to harvest fish, TMJ would also prevent Musqueam from deriving economic benefits from future use of the impacted crown land, for at least the life of the project.

Mitigations:

- Several conditions are proposed to mitigate impacts to Aboriginal title, including an Indigenous Cultural Awareness, Recognition and Mitigation Condition, a Cultural and Archaeological Resource Management Plan, Indigenous Monitors, Engagement and Reporting, and an Indigenous Training, Employment and Procurement Plan. The EAO is also recommending a Marine Access and Transportation Plan as a KMM under CEAA 2012 to reduce impacts to access from construction and operations.

14.5 SEMIAHMOO FIRST NATION

14.5.1 COMMUNITY PROFILE

Semiahmoo First Nation is a Central Coast Salish group whose asserted traditional territory includes part of the Lower Mainland area in BC, including sections of the Fraser River and the Strait of Georgia. Semiahmoo First Nation members historically spoke the hən̓q̓əmin̓əm (pronounced "Hul-ka-MEE-num") language. Semiahmoo First Nation has one reserve, fronting Semiahmoo Bay (part of Boundary Bay) at the Canada-United States border, about one km southeast of White Rock. The reserve, covering approximately 129 ha, is home to 50 of the Nation's 106 registered members[217].

[217] Indigenous and Northern Affairs Canada. 2021. First Nation Profiles – Semiahmoo First Nation. https://fnp-ppn.aadnc-aandc.gc.ca/fnp/Main/Search/FNRegPopulation.aspx?BAND_NUMBER=569&lang=eng, accessed December 13, 2021.

Semiahmoo First Nation's asserted traditional territory is centered on Boundary Bay, takes in the lower Fraser River and adjacent lands downstream of the confluence with the Sumas River, all the Gulf Islands south of Gabriola Island, the San Juan Islands, most of Bellingham Bay, and the Nooksack River. The Boundary Bay area was considered by ethnographers as the core territory of Semiahmoo First Nation. Village sites are identified in the information around the mouth of the Nicomekl River, on Drayton Harbour and from around the mid-1800s, the mouth of the Campbell River. The ethnohistoric information indicates that Cannery Point and the Nicomekl and Campbell Rivers were used by the Semiahmoo people for fishing, hunting, and gathering resources. In the mid-1800s, the information suggests the Semiahmoo may have expanded into an area that opened up for access along the Salmon River.

Semiahmoo First Nation have traditionally fished for salmon, sturgeon, and eulachon, as well as other freshwater and marine species. Semiahmoo First Nation identified Important salmon fishing areas as open-ocean sites off the Point Roberts Peninsula, and riverine environments such as the Nicomekl and Little Campbell rivers that feed into Boundary Bay. Semiahmoo First Nation has indicated that historically their traditional economy included fishing in the lower Fraser River, and this fishing was enabled by relationships with other First Nations.

Semiahmoo village sites around the mouth of the Nicomekl River, Drayton Harbour and the mouth of the Campbell River were identified as specific sites of traditional importance associated with the Semiahmoo First Nation's fishing right. These areas were used by the Semiahmoo people for fishing, hunting, and gathering resources (such as salmon, herring, and shellfish). Semiahmoo reported that they primarily fished for salmon using a technique known as reef-netting. This requires a specific set of conditions which were limited to only a small number of areas within the Strait of Georgia and off the Point Roberts Peninsula and Cannery Point.

14.5.2 SEMIAHMOO FIRST NATION'S INVOLVEMENT IN THE CONSULTATION PROCESS

The EAO is of the view that it has approached consultation with Semiahmoo First Nation at the deeper end of the spectrum, with the intent to identify potential impacts and consider ways to address potential impacts to any Aboriginal Interests in the project area identified by Semiahmoo First Nation. As described in the EAO-led Consultation Activities with Indigenous Groups section of this Report, the EAO invited Semiahmoo First Nation to participate in the Working Group.

The EAO set out its approach to consultation, including assessments of strength of claim and potential impacts on Semiahmoo First Nation's Aboriginal Interests in a letter to Semiahmoo First Nation dated May 11, 2016. Based on the Province's initial assessments,

Semiahmoo First Nation was consulted at the deeper end of the spectrum as set out in Schedule B of the Section 13 Order dated May 11, 2016, which amended the July 24, 2015, Section 11 Order for TMJ.

The EAO invited Semiahmoo First Nation to review and provide comments on the draft Section 11 Order, the draft VC Selection document, the draft AIR, TJLP's Aboriginal Consultation Plan and Reports, the screening of the Application and on the Application and supplemental material, as well as the opportunity to review and comment on several iterations of the EAO's draft decision materials. As part of the EA Working Group, Semiahmoo First Nation was invited to participate in technical meetings, teleconferences, and site visits during the Pre-Application and Application Review stages. The EAO offered to meet directly with Semiahmoo First Nation to discuss TMJ and the EA process.

TJLP began consulting with Semiahmoo First Nation in October 2014 by sending notification letters, before entering the EA process. TJLP reports that they met with Semiahmoo First Nation in June 2016 and Semiahmoo First Nation shared interests related to TMJ. TJLP and Semiahmoo First Nation signed a capacity funding agreement in September 2018 to support participation in the EA process. A summary of TJLP's engagement activities with Semiahmoo First Nation is provided in TJLP's Application and in TJLP's Aboriginal Consultation Reports.

14.5.3 POTENTIAL IMPACTS TO ABORIGINAL INTERESTS

The following sections focus on potential impacts of TMJ to Semiahmoo First Nation's Aboriginal Interests. A discussion of the EAO's assessment approach is provided in the Impact Assessment Methods section of Part C. The EAO considered information from public sources as well as relevant issues raised by the Semiahmoo First Nation during the EA process in the following assessments of the potential impacts of TMJ on the Semiahmoo First Nation's Aboriginal Interests. The following sections focus on the potential impacts of TMJ to Semiahmoo First Nation's Aboriginal right to fish, hunt, trap, and gather, and mitigations and accommodations to address potential impacts.

A. POTENTIAL IMPACTS ON FISHING

The Application reported that Semiahmoo First Nation raised concerns about TMJ in relation to fisheries, the Fraser River foreshore, and the effect of marine traffic, and cumulative effects on the lower Fraser River. Semiahmoo First Nation indicated to TJLP that TMJ would be built on unceded land and Semiahmoo First Nation's interests in the land and water need to be considered. DFO data indicates that Semiahmoo members currently fish for FSC purposes upstream of the Port Mann Bridge between the bridge and Kanaka Creek-Derby Reach. In 2014, two community FSC licences were issued to fish for sockeye by drift net.

The EAO evaluated the potential effects on fishing rights attributable to TMJ which are summarized in Section 13.3.1. The EAO is satisfied that the key impacts to biophysical components resulting in changes to fish quantity and quality, changes in access to fishing resources, and changes to social, cultural, and spiritual values associated with traditional fishing activities summarized in that section apply to Semiahmoo First Nation. Semiahmoo First Nation did not raise specific issues and concerns with potential TMJ impacts relating to fishing to the EAO during the Application Review phase of the EA.

14.5.3.1.1 Conclusion

In consideration of the available information, consultation with Semiahmoo First Nation, Semiahmoo First Nation's engagement with TJLP, TJLP's commitments, the EAO's proposed EAC conditions if an EAC is issued and the recommended KMMs under CEAA 2012, TMJ is expected to result in a **minor** impact on Semiahmoo First Nation's right to fish. The key factors that were considered in support of the EAO's conclusion on the impacts to the right to fish are summarized as follows:

Biophysical:

- The EAO's conclusions in the Fish and Fish Habitat in Part B that TMJ would have potential to result in low magnitude residual effects to fish and fish habitat at the TMJ site, and low magnitude residual effects to sturgeon from vessel strikes. The EAO did not predict residual effects to fish in the MSA area; and
- The lower Fraser River is highly industrial and the TMJ area is previously disturbed and the MSA area is a heavily utilized marine environment.

Geospatial (places, sites and access):

- The importance of fishing on the Fraser River and that Semiahmoo First Nation's members currently fish upstream of the TMJ area;
- During construction, access to the TMJ site would be restricted for three years. During operations, Indigenous mariners and fishers would avoid entering and remaining in the marine terminal area due to the warning signs and notifications regarding elevated public risk, in particular when vessels would be berthing, loading, or de-berthing at TMJ. At the scale of the LAA and RAA this would amount to a low magnitude impact to access from impacts at the TMJ site; and
- The EAO's conclusions in the Current Use chapter in Part B found that TMJ-related vessel transits would have negligible to low magnitude effect to access to fishing compared to baseline numbers of vessel transits, that could be experienced as higher in the Fraser River as a change from baseline compared to Salish Sea. This effect would be

due to regularly occurring (i.e., on average one vessel call per day under the BVS) and short-duration vessel movements to pass through known fishing areas in the Fraser River and Salish Sea.

Social, Cultural and Experiential:

- As outlined in the Current Use assessment in Part B, potential negligible to low magnitude impacts to the change in noise and visual quality during construction and to changes in visual quality and potential concerns about safety during operations in the Fraser River and Salish Sea.

Mitigations:

- Proposed mitigations for potential impacts to Semiahmoo First Nation's right to fish include mitigations to reduce impacts to noise and visual quality in the CEMP and OEMP as well as the recommended key mitigations under CEAA 2012, specifically the Fish Mitigations to Reduce Harm and Mortality, Fish Habitat Offset Plan, Marine Communication Plan, Marine Access and Transportation Plan and Vessel Traffic Management Plan.

B. POTENTIAL IMPACTS ON HUNTING, TRAPPING AND GATHERING

Historically, Semiahmoo First Nation harvested wildlife, including migratory birds, on the lands to the east of Boundary Bay, on both sides of the Canada-USA border. Mountain goat wool was reported as gathered on the north side of the Fraser River, along Kanaka Creek. Semiahmoo First Nation has reported that members have harvested beaver, waterfowl, and migratory birds in proximity to the George Massey Tunnel area of the South Arm of the Fraser River. Beyond the MSA, Semiahmoo First Nation identified Lake Terrell, approximately 6 km southeast of Birch Bay in Washington State, as an area hunted for elk, deer, and beaver. Semiahmoo First Nation hunted ducks at Tongue Spit on Drayton Harbour north of Birch Bay and at the mouths of Dakota and California creeks.

Semiahmoo First Nation harvested camas, an important trade item, in the San Juan Islands and behind their villages around Boundary Bay. Aquatic plants like bulrushes, tule rushes, and grasses were also gathered to manufacture mats that were used for a range of household purposes. Bulrushes and tule were gathered in locations that included Burns Bog. Semiahmoo also harvested a range of berries for food. Other plants harvested included devil's club, rose hip, stinging nettle, and the wood, bark, and roots of various tree species for a range of purposes. Semiahmoo have reported that plant harvesting may still be occurring on the South Arm of the Fraser River, in the vicinity of Tilbury and Deas islands.

The EAO evaluated the potential effects on hunting, trapping, and gathering rights attributable to TMJ which apply broadly to Indigenous Groups. These potential effects are summarized in Section 13.3.2. The EAO is satisfied that the key impacts to biophysical components resulting in changes to wildlife and vegetation quantity and quality, changes in access to hunting, trapping, and gathering areas, and changes to social, cultural, and spiritual values associated with traditional hunting, trapping and gathering activities summarized in that section apply to Semiahmoo First Nation. Semiahmoo First Nation did not raise specific issues and concerns with potential TMJ impacts relating to hunting, trapping, and gathering.

14.5.3.1.2 Conclusion

In consideration of the available information, consultation with Semiahmoo First Nation, Semiahmoo First Nation's engagement with TJLP, TJLP's commitments, the EAO's proposed EAC conditions if an EAC is issued and the recommended KMMs under CEAA 2012, TMJ is expected to result in a **negligible** impact on Semiahmoo First Nation's right to hunt, trap and gather.

The key factors that were considered in support of the EAO's conclusion on the impacts to the right to hunt, trap, and gather are summarized as follows:

Biophysical:

- The EAO's conclusions at the TMJ site on adverse residual effects to Wildlife and Wildlife Habitat and Vegetation (see respective chapters in Part B) indicate negligible to low magnitude residual effects on loss or alteration of wildlife habitat, sensory disturbance from noise and light, and mortality; as well as low magnitude residual effects on wetland and riparian ecosystems; and
- The EAO's conclusions in the MSA area on adverse residual effects to Marine Birds in Part B indicate negligible to low magnitude residual effects related to mortality.

Geospatial (places, sites and access):

- The EAO understands that Semiahmoo First Nations do not currently harvest in the TMJ area but may gather at sites close to the TMJ site located on the South Arm of the Fraser River, in the vicinity of Tilbury and Deas islands;
- Construction (just over three years in duration) and operations (30 years) is unlikely to cause disruptions to Semiahmoo First Nation's access to areas traditionally used for hunting, trapping, and gathering activities at the TMJ site or in the MSA area; and
- The upland portion of the TMJ site is situated on fee simple (private) land.

Social, Cultural and Experiential:

- Potential impacts to experience in the vicinity of the TMJ site and along the shipping route due to a change in noise and visual quality during construction and operations which are anticipated to be negligible to low in magnitude in the Fraser River and Salish Sea.

Mitigations:

- Proposed conditions to mitigate impacts to Semiahmoo First Nation's right to hunt, trap and gather are the vegetation and wetland management, wildlife and wildlife habitat management, light management, and noise management components of the CEMP and OEMP all of which would require consultation with Indigenous Groups. The EAO is also proposing these mitigations as KMMs under CEAA 2012 which would include the requirements for vegetation and wetland creation and restoration, lighting, noise and wildlife and wildlife habitat management and monitoring; and
- All vessels will adhere to the Marine Regulations and Legislation regulating vessel noise and lighting.

C. POTENTIAL IMPACTS ON OTHER TRADITIONAL AND CULTURAL INTERESTS

Semiahmoo First Nation has reported that use of their traditional lands and resources has a spiritual and sacred element not readily separated from practical considerations. Legendary stories reflect this view, which convey that people related to the first ancestors, who descended from the sky, were transformed by Khaals (the Transformer and mythical leader) into physical and biological elements of the landscape and remain relatives of the Semiahmoo. The Semiahmoo therefore consider themselves as part of the landscape (their territory), and this landscape serves as their sacred place, their history book, and training ground. Semiahmoo place names on this landscape include a location along the mainstem of the Fraser River, upstream of the Port Mann Bridge, identified as *KIƛEY* (Katzie).

Semiahmoo First Nation has explained that their traditional economy was based on animals and fish in the area, and that there are pathway effects that lead from the Fraser River into Boundary and Semiahmoo Bays. They have also said that they regularly travelled through and gathered food from their traditional territory, including the Fraser River estuary, Boundary Bay, and areas now in Washington State, and that their members continue to use their territory to practice their traditional economy on both sides of the border.

Semiahmoo First Nation reported use of a travel route through Active Pass to the Gulf Islands and Victoria, emphasizing the importance this route has in maintaining their access to the

island where they have burial grounds. Semiahmoo First Nation reported using traditional forms of transportation such as dug-out canoes along preferred maritime routes.

Semiahmoo First Nation has stated that their Aboriginal Interests include the right to practice their culture in its entirety and the right to food security through their traditional economy. Semiahmoo First Nation reports that urbanization and pollution of their traditional food supply has limited their ability to practice this economy. Semiahmoo First Nation has advised that they are seeking to restore or maintain the environment within their territory to promote the exercise of ancestral uses in the future.

The EAO evaluated the potential effects on other traditional and cultural interests attributable to TMJ which apply broadly to Indigenous Groups. These potential effects are summarized in Section 13.3.3. The EAO is satisfied that the key impacts associated with other traditional and cultures interests summarized in that section apply to Semiahmoo First Nation. Semiahmoo First Nation did not raise specific issues and concerns with potential Project impacts relating to other traditional and cultural interests.

14.5.3.1.3 Conclusion

In consideration of the available information, consultation with Semiahmoo First Nation, Semiahmoo First Nation's engagement with TJLP, TJLP's commitments, the EAO's proposed EAC conditions if an EAC is issued, and recommended KMMs under CEAA 2012 TMJ is expected to result in a **negligible** impact on Semiahmoo First Nation's other traditional and cultural interests.

The key factors that were considered in support of the EAO's conclusion on the impacts to other traditional and cultural interests are summarized as follows:

Cultural and Heritage Resources:

- The EAO's conclusions in the Heritage Resources chapter in Part B found no residual effects to Heritage Resources (Section 7.1) from erosion due to wake effects along the shorelines of the Fraser River in the RAA; and
- The lower Fraser River is highly industrial and the TMJ site is previously disturbed. The MSA area is a heavily utilized marine environment. These factors increase the seriousness of impact of TMJ.

Geospatial (places, sites and access):

- Semiahmoo First Nation use a travel route, sometimes with traditional vessels, through Active Pass to the Gulf Islands and Victoria, to access important areas including burial grounds;

- During construction, access to the TMJ site would be restricted for three years. During operations, Indigenous mariners and fishers would avoid entering and remaining in the marine terminal area due to the warning signs and notifications regarding elevated public risk, in particular when vessels would be berthing, loading, or de-berthing at TMJ; and
- The small number of TMJ-related vessels relative to current vessel traffic are predicted to have a negligible to low effect on cultural activities in the MSA area in terms of access from relatively infrequent and short-duration interruptions due to regularly occurring (i.e., on average one vessel call per day under the BVS) vessel transits.

Social, Cultural, Experiential:

- The EAO's conclusions in the Noise chapter in Part B found sensory disturbances from noise are anticipated to be negligible to low magnitude, temporary, and short-term;
- The EAO's conclusions in the Visual Quality chapter in Part B found a negligible to low impact to the existing visual landscape character in the Fraser River and negligible effects in the MSA area; and
- Potential negligible impacts from TMJ-related vessel traffic during operations affecting visual quality, noise, and vessel wake (with an increasing magnitude of effect the closer one is to the vessels).

Mitigations:

- Proposed provincial conditions to mitigate impacts to Semiahmoo First Nation's cultural interests, include the development of the Lighting Management, Noise and Vibration Management and Air Quality Management as part of the CEMP and OEMP; and
- To mitigation impacts to cultural heritage the EAO is recommending KMMs under CEAA 2012 for the Marine Access and Transportation, Marine Communications and Vessel Traffic Management Plans.

14.6 SQUAMISH NATION

14.6.1 COMMUNITY PROFILE

Squamish Nation describe themselves as the descendants of Coast Salish ancestors that lived in what are now known as the Greater Vancouver area, Gibson's Landing and Squamish River watershed. Squamish (*Skwxwú7mesh Úxwumixw*) are Central Coast Salish and speak *Skwxwú7mesh sníchim.*

Squamish Nation has 24 reserves, mostly located around Howe Sound and along the southern portions of the Squamish River, and with 2,211 of 4,386 registered members residing on Squamish Nation's reserve lands[218]. The TMJ area does not overlap any current or former Squamish Nation reserve lands.

Squamish territory has been described as taking in the area from Point Grey in the south to Roberts Creek in the west; then north along the height of land to the Elaho River headwaters including all the islands and drainages in Howe Sound; then southeast to the confluence of the Soo and Green rivers north from Whistler; then south along the height of land to the Port Moody area including the entire Mamquam River and Indian Arm drainages; then west along the height of land to Point Grey. The area in which Squamish Nation asserts their Aboriginal right to fish extends further south, to take in the Fraser River downstream of the Port Mann Bridge[219].

14.6.2 SQUAMISH NATION'S INVOLVEMENT IN THE CONSULTATION PROCESS

The EAO is of the view that it has approached consultation with Squamish Nation at the deeper end of the spectrum, with the intent to identify potential impacts and consider ways to address potential impacts to any Aboriginal Interests in the project area identified by Squamish Nation. The EAO added Squamish to Schedule B in the Section 13 Order (May 11, 2016), and as described in the EAO-led Consultation Activities with Indigenous Groups section of this Report, the EAO invited Squamish Nation to participate in the Working Group.

The EAO set out approach to consultation, including assessments of strength of claim and potential impacts on Squamish Nation's Aboriginal Interests in a letter to Squamish Nation dated May 11, 2016. Based on the Province's initial assessments, Squamish Nation was consulted at the deeper end of the spectrum as set out in Schedule B of the Section 13 Order dated May 11, 2016 which amended the July 24, 2015 Section 11 Order for TMJ.

The EAO invited Squamish Nation to review and provide comments on the draft Section 11 Order, the draft VC Selection document, the draft AIR, TJLP's Aboriginal Consultation Plan and Reports, the screening of the Application and on the Application and supplemental material, as well as the opportunity to review and comment on several iterations of the EAO's draft decision

[218] Indigenous and Northern Affairs Canada. 2021. First Nation Profiles – Squamish Nation. https://fnp-ppn.aadnc-aandc.gc.ca/fnp/Main/Search/FNRegPopulation.aspx?BAND_NUMBER=555&lang=eng, accessed December 13, 2021.

[219] Pattullo Bridge Replacement Project EAC Application, 2018 https://projects.eao.gov.bc.ca/api/document/5b7343562400e50024428f13/fetch, accessed May 29, 2019

materials. As part of the EA Working Group, Squamish Nation was invited to participate in Working Group meetings, teleconferences, and site visits (October 2018) during the Pre-Application and Application Review stages. Squamish Nation participated in a pre-Application Working Group meeting. The EAO offered to meet directly with Squamish Nation to discuss the project, EA process, and any potential concerns with the project.

TJLP began consulting with Squamish Nation in December 2014 by sending notification letters, before entering the EA process. TJLP reports that in June of 2018, TJLP and Squamish Nation agreed to preliminary funding to support Squamish Nation's participation in the review of the draft AIR. A summary of TJLP's engagement activities with Squamish Nation is provided in the Application and in TJLP's Aboriginal Consultation Reports.

14.6.3 POTENTIAL IMPACTS TO ABORIGINAL INTERESTS

The following sections focus on potential impacts of TMJ to Squamish Nation's Aboriginal Interests. A discussion of the EAO's assessment approach is provided in the Impact Assessment Methods section of Part C. The EAO considered information from public sources as well as relevant issues raised by the Squamish Nation during the EA process in the following assessments of the potential impacts of TMJ on the Squamish Nation's Aboriginal Interests. The following sections focus on the potential impacts of TMJ to Squamish Nation's Aboriginal right to fish, hunt, trap, and gather, and mitigations and accommodations to address potential impacts.

A. POTENTIAL IMPACTS ON FISHING

Squamish Nation stated that, since time immemorial, salmon has been a principal food for Squamish Nation and that the Fraser River has been a major source of that salmon. Historically, Squamish Nation practiced a seasonal pattern of arriving on the Fraser River in April to fish and returning to Burrard Inlet in late September (Squamish Nation, 2018).

Squamish Nation reported that there is no other source of sockeye in Squamish Nation territory other than the Fraser River, and that fishing sockeye on the Fraser River, while not currently practiced, remains integral to Squamish Nation culture (MOTI 2016: 10.1-134). Squamish Nation has previously noted they are seeking to re-establish their sockeye fishing practices in the Fraser River and ancestral connections to the area. Squamish Nation have previously noted that other Indigenous Groups who currently fish in the Fraser River in the area of the Project may be asked by Squamish Nation to fish on their behalf; however, at present, Squamish Nation say their sockeye is obtained by a contracted seine boat that harvests the fish in the Johnstone Strait area, outside Squamish territory and traditional fishing areas (MOTI 2016: 10.1-135). The Squamish Nation's FSC allocation for sockeye has been reported as 20,000. Squamish have

requested that DFO increase this allocation to 70,000, which translates into approximately 17 sockeye per member.

The EAO evaluated the potential effects on fishing rights attributable to TMJ which are summarized in Section 13.3.1. The EAO is satisfied that the key impacts to biophysical components resulting in changes to fish quantity and quality, changes in access to fishing resources, and changes to social, cultural, and spiritual values associated with traditional fishing activities summarized in that section apply to Squamish First Nation. Additional issues raised by Squamish First Nation are outlined below and include a discussion of EAC conditions and recommended key mitigations under CEAA 2012.

The Application notes that Squamish Nation raised the following concerns regarding potential impacts on the right to fish:

- Concern about underwater noise during construction and operations, including in the shipping lanes.
    - See Section 13.3.1 for a detailed discussion of the analysis and resolution of concerns related to the effects of underwater noise from TMJ on fish. As discussed in Section 13.3.1, the proposed mitigation measures to address this concern are included in the KMMs under CEAA 2012 proposed by EAO for Fish Mitigations to Reduce Harm and Mortality, including the use of bubble curtains at all times during impact pile driving where feasible and during vibratory pile driving if noise levels exceed thresholds.
- Concerns regarding the potential adverse effect TMJ would have on Squamish Nation fishing rights. This would include secondary impacts to Indigenous fishers who fish on behalf of Squamish Nation.
    - In section the Current Use chapter in Part B of this Report, the EAO concludes that TMJ has the potential to interrupt Indigenous fishing during construction (just over three years), operations (30 years) and decommissioning (one year) due to transportation and marine shipping in the Fraser River, dredging activities, onshore construction and that Indigenous mariners and fishers would avoid entering and remaining in the marine terminal area; and
    - The EAO is recommending key mitigations under CEAA 2012 for a Marine Communication Plan and Marine Access and Transportation Plan. These plans would identify the procedures of communication to Indigenous Groups and identification of mitigations to reduce disruptions caused by construction and operations for members of Indigenous Groups to carry out traditional use activities including fishing for FSC purposes.

14.6.3.1.1 Conclusion

In consideration of the available information, the EAO's consultation with Squamish Nation, Squamish Nation's engagement with TJLP, TJLP's commitments, the EAO's proposed EAC conditions if an EAC is issued and the recommended KMMs under CEAA 2012, TMJ is expected to result in a **minor** impact on Squamish Nation's right to fish.

The key factors that were considered in support of the EAO's conclusion on the impacts to the right to fish are summarized as follows:

Biophysical:

- The EAO's conclusions in the Fish and Fish Habitat in Part B that TMJ would have potential to result in low magnitude residual effects to fish and fish habitat at the TMJ site, and low magnitude residual effects to sturgeon from vessel strikes. The EAO did not predict residual effects to fish in the MSA area; and
- The lower Fraser River is highly industrial and the TMJ site is previously disturbed and the MSA area is a heavily utilized marine environment.

Geospatial (places, sites and access):

- During construction, access to the TMJ site would be restricted for three years. During operations, Indigenous mariners and fishers would avoid entering and remaining in the marine terminal area due to the warning signs and notifications regarding elevated public risk, in particular when vessels would be berthing, loading, or de-berthing at TMJ. At the scale of the LAA and RAA this would amount to a low magnitude impact to access from impacts at the TMJ site;
- The EAO's conclusions in the Current Use chapter in Part B found that TMJ-related vessel transits would have negligible to low magnitude effect to access to fishing compared to baseline numbers of vessel transits, that could be experienced as higher in the Fraser River as a change from baseline compared to Salish Sea. This effect would be due to regularly occurring (i.e., on average one vessel call per day under the BVS) and short-duration vessel movements to pass through known fishing areas in the Fraser River and Salish Sea;
- Specific to the BVS there is potential for higher frequency of interactions to occur between TMJ-related vessels and Indigenous Groups engaging in vessel-based FSC fishing in the lower Fraser River during FSC fishing windows and that this effect would apply to Squamish Nation should members engage in vessel based FSC fishing activities in the lower Fraser River in the future.

- Squamish Nation's members seek to resume fishing in the Fraser River; and
- Due to small number of TMJ-related vessels relative to current vessel traffic along the shipping route, these are predicted to have low to negligible residual effects on access to fishing.

Social, Cultural and Experiential:

- As outlined in the Current Use assessment in Part B, potential negligible to low magnitude impacts to the change in noise and visual quality during construction and to changes in visual quality and potential concerns about safety during operations in the Fraser River and Salish Sea.

Mitigations:

- Proposed mitigations for potential impacts to Squamish Nation's right to fish include mitigations to reduce impacts to noise and visual quality in the CEMP and OEMP as well as the recommended key mitigations under CEAA 2012, specifically the Fish Mitigations to Reduce Harm and Mortality, Fish Habitat Offset Plan, Marine Communication Plan, Marine Access and Transportation Plan and Vessel Traffic Management Plan.

B. POTENTIAL IMPACTS ON HUNTING TRAPPING AND GATHERING

Squamish Nation reported hunting elk, deer, moose, mountain goats, black bears, small terrestrial mammals, beaver, muskrat, otters, mink, marmots, ducks, geese and gulls. Squamish Nation reported hunting deer primarily on Anvil, Bowen, Keats and Gambier Islands as well as White Beach on the mainland. Mountain goats were harvested along the Squamish River, McNab Creek and Deer Creek and marine birds in the Strait of Georgia as well as areas along the Fraser River.

Squamish Nation reported harvesting a variety of plants at different times of the year such as berries and other fruits, tender shoots, edible roots, tubers and bulbs as well as different types of wood (such as Douglas-fir and yellow cedar) and aquatic plants.

The EAO evaluated the potential effects on hunting, trapping and gathering rights attributable to TMJ which apply broadly to Indigenous Groups. These potential effects are summarized in Section 13.3.2. The EAO is satisfied that the key impacts to biophysical components resulting in changes to wildlife and vegetation quantity and quality, changes in access to hunting, trapping and gathering areas, and changes to social, cultural, and spiritual values associated with traditional hunting, trapping and gathering activities summarized in that section apply to the Squamish Nation. Squamish Nation did not raise specific issues and concerns with potential TMJ impacts relating to hunting, trapping and gathering.

14.6.3.1.2 Conclusion

In consideration of the available information, consultation with Squamish Nation, Squamish Nation's engagement with TJLP, TJLP's commitments, the EAO's proposed EAC conditions if an EAC is issued and the recommended KMMs under CEAA 2012, TMJ is expected to result in a **negligible** impact on Squamish Nation's right to hunt, trap and gather.

The key factors that were considered in support of the EAO's conclusion on the impacts to the right to hunt, trap and gather are summarized as follows:

Biophysical:

- The EAO's conclusions at the TMJ site on adverse residual effects to Wildlife and Wildlife Habitat and Vegetation (see respective chapters in Part B) indicate negligible to low magnitude residual effects on loss or alteration of wildlife habitat, sensory disturbance from noise and light, and mortality; as well as low magnitude residual effects on wetland and riparian ecosystems; and
- The EAO's conclusions in the MSA area on adverse residual effects to Marine Birds in Part B indicate negligible to low magnitude residual effects related to mortality.

Geospatial (places, sites and access):

- The EAO understands that Squamish Nation members do not currently harvest in the TMJ area;
- Construction (just over three years in duration) and operations (30 years) is unlikely to cause disruptions to Squamish Nation member's access to areas traditionally used for hunting, trapping and gathering activities at the TMJ site or in the MSA area; and
- The upland portion of the TMJ site is situated on fee simple (private) land.

Social, Cultural and Experiential:

- Potential impacts to experience in the vicinity of the TMJ site and along the shipping route due to a change in noise and visual quality during construction and operations which are anticipated to be negligible to low in magnitude in the Fraser River and Salish Sea.

Mitigations:

- Proposed conditions to mitigate impacts to Squamish Nation's right to hunt, trap and gather are the vegetation and wetland management, wildlife and wildlife habitat management, light management and noise management components of the CEMP and OEMP all of which would require consultation with Indigenous Groups. The EAO is also

proposing these mitigations as KMMs under CEAA 2012 which would include the requirements for vegetation and wetland creation and restoration, lighting, noise and wildlife and wildlife habitat management and monitoring; and

- All vessels will adhere to the Marine Regulations and Legislation regulating vessel noise and lighting.

C. POTENTIAL IMPACTS ON OTHER TRADITIONAL AND CULTURAL INTERESTS

Squamish Nation identified areas at Bains Island (Brackendale), Cheekye, burial sites and old village sites, canoe landing sites on Howe Sound Islands, Potlatch Creek, and traditional fishing areas.

Squamish Nation has previously discussed the loss of resources within their asserted territory such as eulachon has meant the loss of part of Squamish culture. Squamish Nation members have discussed the fact that they can no longer teach their grandchildren or great grandchildren how to dig clams, harvest crabs or dry seaweed.

Squamish Nation reported waterways as being important travel routes historically and currently when harvesting marine resources, crossing the Salish Sea and transferring cultural knowledge. Concern was reported regarding young Squamish Nation members lacking opportunities to get out into the river systems within their asserted territory.

The EAO evaluated the potential effects on other traditional and cultural interests attributable to TMJ which apply broadly to Indigenous Groups. These potential effects are summarized in Section 13.3.3. The EAO is satisfied that the key impacts associated with other traditional and cultures interests summarized in that section apply to Squamish Nation. Squamish Nation did not raise specific issues and concerns with potential Project impacts relating to other traditional and cultural interests.

14.6.3.1.3 Conclusion

In consideration of the available information, consultation with Squamish Nation, Squamish Nation's engagement with TJLP, TJLP's commitments, the EAO's proposed EAC conditions if an EAC is issued and the recommended KMMs under CEAA 2012, TMJ is expected to result in a **negligible** impact on Squamish Nation's other traditional and cultural interests.

The key factors that were considered in support of the EAO's conclusion on the impacts to other traditional and cultural interests are summarized as follows:

Cultural and Heritage Resources:

- The EAO's conclusions in the Heritage Resources chapter in Part B found no residual effects to Heritage Resources (Section 7.1) from erosion due to wake effects along the

shorelines of the Fraser River in the RAA; and

- The lower Fraser River is highly industrial and the TMJ site is previously disturbed. The MSA area is a heavily utilized marine environment. These factors increase the seriousness of impact of TMJ.

Geospatial (places, sites and access):

- During construction, access to the TMJ site would be restricted for three years. During operations, Indigenous mariners and fishers would avoid entering and remaining in the marine terminal area due to the warning signs and notifications regarding elevated public risk, in particular when vessels would be berthing, loading, or de-berthing at TMJ; and
- The small number of TMJ-related vessels relative to current vessel traffic are predicted to have a negligible to low effect on cultural activities in the MSA area in terms of access from relatively infrequent and short-duration interruptions due to transit of vessels to and from TMJ's marine terminal area.

Social, Cultural, Experiential:

- The EAO's conclusions in the Noise chapter in Part B found sensory disturbances from noise are anticipated to be negligible to low magnitude, temporary and short-term;
- The EAO's conclusions in the Visual Quality chapter in Part B found a negligible to low impact to the existing visual landscape character in the Fraser River and negligible effects in the MSA area; and
- Potential negligible impacts from TMJ-related vessel traffic during operations affecting visual quality, noise and vessel wake (with an increasing magnitude of effect the closer one is to the vessels).

Mitigations:

- Proposed provincial conditions to mitigate impacts to Squamish Nation's cultural interests, include the development of the Lighting Management, Noise and Vibration Management and Air Quality Management as part of the CEMP and OEMP; and
- To mitigation impacts to cultural heritage the EAO is recommending KMMs under CEAA 2012 for the Marine Access and Transportation, Marine Communications and Vessel Traffic Management Plans.

14.7 TSAWWASSEN FIRST NATION

14.7.1 OPENING PRAYER

Tsawwassen First Nation requested that this chapter open with a prayer in Tsawwassen's dialect of the Hun'qum'i'num language to help orient the reader to the relationships and values that Tsawwassen has identified as being at issue in the TMJ EA.

ʔo cicəɬ siʔeṁ, sx̌iʔ ct ciyəθamə nəċexʷ ʔəw ʔaxʷəstalx́ʷ tənˀa weyəl sx̌iʔ ct ciyəθamə ʔəw ʔaxʷəstalx́ʷ tə təməxʷ wə θəyt nə sxʷʔaṁət ct sx̌iʔ ct ciyəθamə ʔəw ʔaxʷəstalx́ʷ nə sxʷʔalx́əqʷaʔ ct ʔəw ċɬwet tənˀa təməxʷ nə sxʷalx́əqʷaʔ ct ʔə tə sx̌pelx́əqən niẇ ɬaɬək̓ʷ ʔə tə sweyəl nə sxʷalx́əqʷaʔ ct ʔə tə x̌əθənxən niẇ ʔiṁəx ʔə tə təməxʷ ʔəw steʔe tə ɬniməɬ ʔiʔ nə sxʷʔalx́əqʷaʔ ct ʔə tə q̓ətmən niẇ xtem ʔə tə x̌acaʔ ʔiʔ stalx́əẇ ʔiʔ k̓ʷax̌kʷə sx̌iʔ ct ɬq̓ilx̓əmə, cicəɬ siʔeṁ ʔəw ʔəx̌imtalx́ʷ təθ xʷʔəẏəm ʔiʔ ċeċəẇətalx́ʷ ʔə tə yays ct ʔəw ɬəq̓qentalx́ʷ tənˀa weyəl/xʷne:n̓t hay čxʷ q̓ə cicəɬ siʔem	Oh noble one up above (Creator), We want to thank you first for giving us this day We wish to thank you for giving us the Earth upon which to make our home We wish to thank you for giving us our brethren who share our home with us Our brethren of the feathers who fly the skies above us Our brethren of the four legs who walk the Earth as we do and our finned brethren who swim in the lakes, rivers and ocean that surround us We wish to ask you, Creator, to lend us your strength to assist us in the tasks that are lain before us this day Thank you Creator

14.7.2 PURPOSE OF, AND UNIQUE APPROACH TO THIS CHAPTER

This chapter is an assessment of how the proposed TMJ project may impact the modern Treaty rights of Tsawwassen First Nation based on information provided during the EA and consultation process.

The purpose of this assessment, from a provincial and federal Crown perspective, is to understand how TMJ may impact Tsawwassen First Nation's Treaty rights and to identify ways to avoid, mitigate or accommodate impacts to the rights and aspirations of the Tsawwassen First Nation under the Tsawwassen Final Agreement. The EAO notes that much of the

information contained in this section was provided by Tsawwassen First Nation, including the recommendations for certain government actions to address those TMJ's impacts to Treaty rights for which a project condition is not feasible or likely to be effective.

This chapter uses a unique structure that follows the preferred methodology outlined by Tsawwassen First Nation in its March 30, 2020 briefing note, *Tsawwassen First Nation's Assessment of Impacts to Tsawwassen First Nation Treaty Rights for TMJ Tilbury Marine Jetty Project*. The three steps in the assessment process for Tsawwassen First Nation, as outlined in the memo, are as follows:

Step 1: Determining the context in which potential impacts on rights will occur

Step 2: Evaluating potential project impacts to rights

Step 3: Follow-up and validation

Step three occurred through Tsawwassen's review of a draft of this rights assessment during the collaborative, consensus-driven process used by the EAO and Tsawwassen First Nation to consider the potential impacts of the TMJ project on the Treaty rights of Tsawwassen First Nation. While Step 3 is not explicitly described here, EAO and the Tsawwassen First Nation have largely reached consensus on the nature of the most serious impacts of the project to Tsawwassen's Treaty rights after taking into account proposed mitigations.

The discussion of the consultation process used with Tsawwassen First Nation in this EA is included in a final section relating to the Project's contribution to reconciliation in light of the close relationship between consultation, seeking consent and reconciliation.

14.7.3 COMMUNITY PROFILE AND OTHER CONTEXTUAL INFORMATION RELEVANT TO EXERCISE OF RIGHTS IN THE PROJECT AREA (STEP 1 OF THE TSAWWASSEN METHODOLOGY)

Introduction and Overview

A Modern Treaty Nation: The Tsawwassen First Nation is a modern Treaty Nation and holds the distinction of being British Columbia and Canada's partner in the first modern treaty in an urban setting in British Columbia through the Tsawwassen First Nation Final Agreement ("Tsawwassen Final Agreement" or "Treaty") with Canada and BC which came into effect on

April 3, 2009.[220] The Tsawwassen Final Agreement establishes a new government-to-government relationship based on mutual respect, providing the basis for a new approach to reconciliation between Tsawwassen First Nation and the Crown.

šxʷkʷecxənəm (stewardship) as a core tenet of Tsawwassen identity and values: The həńqəmiṅəm̓ word šxʷkʷecxənəm means to be stewards of the land. The EAO understands the term šxʷkʷecxənəm to encompass at least three distinct elements. First, šxʷkʷecxənəm encompasses a number of practices close to the land and water. Second, the "šxʷ" in the word highlights that stewardship is also a matter of Tsawwassen First Nation identity. This is a state of being that is integral to who Tsawwassen people are because it reflects their holistic world view that everything is interconnected, both in physical and spiritual realities. Third, šxʷkʷecxənəm is a relationship and it goes beyond a simple desire to ensure resource abundance. Tsawwassen First Nation stewardship is a relationship built on respect and gratitude for having healthy waters, lands, and species in the territory that exist in equilibrium with the social, cultural, and economic lives and activities of Tsawwassen members. Tsawwassen First Nation described repatriation ceremonies where ancestors voiced the importance of the area where TMJ is proposed to operate for the values and practices associated with šxʷkʷecxənəm.

šxʷkʷecxənəm and its place in Treaty: Among other things, the Treaty confirms the parties' shared intention to recognize and support Tsawwassen First Nation's aspirations to assert its place as stewards of its territory and resources. It also confirms the parties' shared intention to support the enhancement of Tsawwassen First Nation identity through the creation of new tools, processes, and relationships that help advance Tsawwassen stewardship values. As a result, the ability and obligation to be active stewards of Tsawwassen territory, waters, and resources has become a component not just of Tsawwassen identity but also Tsawwassen First Nation's forward-looking vision as a modern treaty nation.

[220] Tsawwassen First Nation Final Agreement. https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/consulting-with-first-nations/agreements/tsawwassen_first_nation_final_agreement_printed_in_2010.pdf

Tsawwassen's connection to areas where TMJ is proposed to operate[221]: Aspects of Tsawwassen First Nation's Treaty rights and culture are tied closely to the conditions that support their relationship with and use of the Fraser River and the marine shipping area. Tsawwassen First Nation reiterated throughout the assessment that the area of the Fraser River where TMJ is proposed to operate is vital to Tsawwassen history and culture and the EAO understands that stewardship and restoration of the Fraser River are among the highest priorities of Tsawwassen First Nation with respect to its Treaty rights due to the function that the Fraser River serves in the health, distinctiveness, prosperity and vitality of Tsawwassen First Nation.

Tsawwassen's serious concerns about impacts from TMJ: Tsawwassen First Nation has expressed considerable concerns with TMJ impacts to Tsawwassen Treaty rights and values. Tsawwassen First Nation's concerns are heightened because of its experiences with cumulative effects on the lower Fraser River, including culturally important resources within it. Tsawwassen First Nation asserts that its reasonable opportunity to harvest fish has been significantly impaired and denied due to pressures from cumulative effects and has stated that provincial approval of TMJ would likely further deny its reasonable opportunities to harvest Fish.

Unique focus of this assessment: The following subsections summarize contextual information about the three components of Tsawwassen's rights and values under the Tsawwassen Final Agreement that Tsawwassen First Nation and the EAO identified as those most at issue in this EA: culture, Tsawwassen harvesting, and Tsawwassen stewardship and governance.

Tsawwassen First Nation Culture

Culture supports Treaty rights: Tsawwassen advises that the exercise of its Treaty rights, and the social, cultural and physical health of Tsawwassen First Nation people, depends on having the conditions required to maintain a strong and vibrant Tsawwassen culture. Understanding Tsawwassen First Nation's relationship to the lands and waters of their Territory is critical to understanding the conditions needed to maintain Tsawwassen's culture.

[221] Noting that the marine terminal area of TMJ is located within the Tsawwassen Fishing Area (see: Microsoft Word - VANCOUVR-#1205160-v11-TSAWWASSEN_FINAL_AGREEMENT_APPENDICES_ENGLISH_-_FINAL_APPROVED.DOC (gov.bc.ca) at Appendix J-1).

The Lower Fraser is a culturally important area to Tsawwassen: The Fraser River is highly relevant to Tsawwassen cultural well-being as described in the following quote from a Tsawwassen member:

> *The Fraser River is the lifeblood and one of the defining characteristics of Tsawwassen territory and Tsawwassen existence. It is a source of food, a vital transportation corridor, a spiritual venue, an aid to navigation and wayfinding, it is a place to teach, and to learn, it supports many living creatures of economic, spiritual and cultural value to Tsawwassen people.*

The Fraser River also plays a defining role in Tsawwassen First Nation's cultural identity as a "host" Nation in relation to other Indigenous groups. Historically, Tsawwassen First Nation held potlatches, participated in mask dancing, and welcomed canoes that came in along the River.

The Lower Fraser and Marine Shipping Area contain culturally important species to Tsawwassen: The EAO understands that the presence of healthy and abundant fish species that are culturally important is one of the conditions that Tsawwassen First Nation has indicated support their Treaty rights. Salmon, in particular, are essential to Tsawwassen First Nation's history, economy, and culture. Tsawwassen First Nation oral history described salmon being created in Tsawwassen First Nation Territory. Eulachon and sturgeon, present in the lower Fraser River, are also highly valued culturally by Tsawwassen First Nation people.

Access to the Lower Fraser and the Marine Shipping Area plays a role in maintaining Tsawwassen language: Tsawwassen First Nation's language is a core component of their culture as it captures their worldview through, for example, place names that describe relationships to lands and waters and how they are used by Tsawwassen people. Transmission of language to succeeding generations along with other cultural practices and beliefs is integral to Tsawwassen cultural continuity. Tsawwassen First Nation's language is intrinsically linked to the lands and waters of their Territory. Tsawwassen Nation reports that language retention has been heavily impacted by colonial practices, including residential school where they were forbidden from speaking their language, and views any impediment to their ability to access and use the land and Fraser River as detrimental to Tsawwassen's ability to teach their language.

Intergeneration transfer of Tsawwassen culture depends on access to culturally important areas and practices, including the lower Fraser River and the Marine Shipping Area: Tsawwassen First Nation indicates that the ability to teach Tsawwassen First Nation's language, practices, and beliefs in culturally relevant places is integral to sustaining Tsawwassen First Nation's vibrant culture. The EAO understands that intergenerational transfer of Tsawwassen First Nation culture relies heavily on having access to preferred travel routes, harvesting areas and cultural sites in a culturally appropriate manner. For example, fishing was, and continues to be, an important cultural activity between youth and Elders. Tsawwassen First Nation have explained that exercising culture is not simply harvesting resources in any location but rather the continuation of an activity that has been practiced in a particular location since time immemorial. This is tied to members' relationship to the Fraser River and is an expression of identity.

Intergeneration transfer of Tsawwassen culture depends on safe conditions in the lower Fraser River and Marine Shipping Area: The EAO understands that having a safe and healthy physical environment is another component of Tsawwassen cultural transmission. Tsawwassen First Nation explained that their ability to peacefully enjoy their lands and waters is central to their culture. Tsawwassen members report that concern about interactions with large vessels or contaminated resources can limit teaching opportunities and restrict the scope of what can be taught. For example, as an important milestone in a child's life, providing food for the community is a cultural sign of maturity and part of growing up as a Tsawwassen person – if youth cannot engage in harvesting in culturally appropriate areas because of safety concerns, they miss this important Tsawwassen rite. It is important to note that Tsawwassen First Nation has a young and growing population, which means that having fewer opportunities to pass down their traditional knowledge through harvesting may have a disproportionate impact on what Tsawwassen First Nation considers healthy development for future generations.

Tsawwassen First Nation harvesting in and around the TMJ Project Area

Tsawwassen harvesting rights in the Fraser River and Marine Shipping Area: Under the Tsawwassen Final Agreement, Tsawwassen First Nation is guaranteed the right to harvest fish

and aquatic plants in the Tsawwassen Fishing Area[222], the right to harvest intertidal bivalves in the Tsawwassen Intertidal Bivalve Fishing Area[223], right to harvest wildlife in the Tsawwassen Wildlife Harvest Area, right to harvest migratory birds in the Tsawwassen Migratory Bird Harvest Area[224], and the right to harvest plants in certain plant gathering areas (identified in Appendix M-2 of the Tsawwassen Final Agreement). British Columbia may authorize uses of or dispose of provincial Crown land that may affect the methods, times, and locations of Tsawwassen First Nation's right to harvest fish and aquatic plants provided those authorized uses or dispositions do not deny Tsawwassen First Nation the reasonable opportunity to harvest fish and aquatic plants in the Tsawwassen Fishing Area[225]. The TMJ site and associated activities are within the Tsawwassen Fishing Area, Tsawwassen Wildlife Harvest Area, and Tsawwassen Migratory Bird Harvest Area established under the Tsawwassen Final Agreement. Tsawwassen First Nation alleges that existing cumulative effects already significantly impair and deny its reasonable opportunity to harvest fish and that approval of the Project could deny Tsawwassen First Nation the reasonable opportunity to harvest under the Tsawwassen Fishing Right in the Tsawwassen Fishing Area.

The importance of the lower Fraser River and Marine Shipping Area to Tsawwassen Harvesting: A number of culturally important resources, like eulachon and sturgeon, are rare in Tsawwassen's harvesting areas but are present in the TMJ project area, highlighting its importance for Tsawwassen harvesting rights. A Tsawwassen member described the importance of harvesting in the Lower Fraser as follows:

[222] The Tsawwassen Fishing Area includes Boundary Bay, the lower reaches of the Fraser River, and roughly out to the "elbow" of the USA Canada marine border. This area is covered by the original application area and segments A-1 and A of the MSA area.

[223] The Tsawwassen Intertidal Bivalve Area is composed of the shores of Galiano, Mayne, Saturna, and Tumbo Islands which are within Segments A & B of the MSA area.

[224] The Tsawwassen Wildlife Harvest Area and Tsawwassen Migratory Bird Harvest Area includes the lands surrounding Pitt Lake, much of the area of the lower mainland south of Burnaby and Vancouver, and areas on Saltspring Island, Mayne Island, Saturna, and Pender Islands.

[225] Chapter 9, Paragraph 9: Tsawwassen First Nation Final Agreement. https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/consulting-with-first-nations/agreements/tsawwassen_first_nation_final_agreement_printed_in_2010.pdf.

> *The mouth of the Fraser is the vital transition between freshwater and saltwater, making it critical habitat in its own right, but also for all species of salmon. Salmon are of critical importance not only to Tsawwassen people as a food source, and as an aspect of biodiversity and ecological health, but it is also important as a food source for other animals, and those animals are also of critical importance to Tsawwassen culture and identity. Historic and contemporary harvesting of those fish and other animals is foundational to Tsawwassen identity and worldview; and that identity and worldview are reflected in and protected by our treaty. The identity of Tsawwassen people, the connection that we have to all living things in our territory and our connection to all orders of government, described by the treaty, shape our current worldview and lived experience; deleterious changes in the environment will doubtless be reflected in negative changes to our lives and our ways of being.*

Tsawwassen harvesting depends on having sufficient abundance of traditional resources: Tsawwassen harvesting for food, social, ceremonial and economic purposes can only occur when there are abundant and accessible traditional resources. In the past within their territory, Tsawwassen had an abundance of resources such as clams, crab, shellfish, salmon, sturgeon, elk, deer, marine mammals, eulachon, traditional plants and migratory birds in a healthy state in terms of quantity and quality within Tsawwassen territory. Tsawwassen are the salmon people, or sce:lhtun xwelmexw (which reflects the critical importance of salmon as a staple food of the Nation), and they require access to salmon *and* abundant, healthy salmon to be able to engage in salmon harvesting. To the extent they are able to, Tsawwassen members continue to rely on these resources today.

Tsawwassen reports significant declines in the availability of traditional resources present in the lower Fraser River and Marine Shipping Area: Tsawwassen First Nation identified that one of their traditional staple foods was Chinook salmon, which Tsawwassen First Nation members relied upon for food, social and ceremonial (FSC) purposes, and that numbers have been declining to the point where Chinook salmon are now assessed as endangered by COSEWIC and the limited DFO openings do not permit Tsawwassen First Nation to meet either community needs or allocations under Treaty-based agreements. According to Tsawwassen First Nation, eulachon, a traditional food that was historically relied upon, can no longer meet the needs of Tsawwassen First Nation but remains highly desirable. Although Tsawwassen First Nation continues to provide eulachon to elders, the chance for other members to have eulachon is very rare. The EAO understands that sturgeon is no longer harvested due to regulatory

restrictions and the observed low abundance in general. In addition, marine vegetation has become increasingly challenging to harvest.

Traditional medicinal plants on Tsawwassen lands, such as thimbleberries and huckleberries, continue to be displaced by invasive species. Provincial and municipal regulations for shooting zones have limited members' ability to access shorebirds, which alters the conditions in which members engage in the hunt.

Safety and sense of place are important conditions that support Tsawwassen harvesting: Tsawwassen First Nation identified the ability to harvest also depends on a sense of safety and conditions that maintain Tsawwassen's sense of place. Tsawwassen First Nation is and has always been a forward-looking Nation, with a strong sense of its duty to ensure that younger generations and their children are able to thrive and prosper: Tsawwassen indicates that this means that conditions relating to safety and sense of place are particularly critical in the context of Tsawwassen Members teaching harvesting practices to their children.

Tsawwassen First Nation reports existing safety concerns that impede harvesting: A diminished sense of place and reduced safety in the Fraser River are causing Tsawwassen Members stress and anxiety in the exercise of their Treaty rights. Tsawwassen reports that harvesting practices in the lower Fraser River and Marine Shipping Area are affected by the presence of large vessels, which can be linked to the rate of development witnessed in Tsawwassen First Nation lands and waters. There is resulting stress for Tsawwassen members due to the likelihood of contamination of resources linked to poor water quality. The persistence of harmful noise levels and light pollution that members experience while harvesting further impedes harvesting experience. The combination of diminished access to healthy traditional foods, restrictive and less access to Tsawwassen territory, and the inability to participate in activities in a manner consistent with Tsawwassen cultural wellbeing has affected harvesting practices, individually and collectively.

Tsawwassen First Nation governance and stewardship

Government-to-Government Relationship: Tsawwassen First Nation is a modern Treaty First Nation. The Treaty is a promise by Canada and British Columbia to work in partnership with Tsawwassen, and to respect Tsawwassen as an equal partner, and not as a government that is subordinate to other levels of government.

Tsawwassen governance in inherently rooted in its relationship with its territory, including the Fraser River: The Tsawwassen First Nation has the right to self-government and the authority to make laws, as set out in the Tsawwassen Final Agreement. The Tsawwassen First Nation Government has a constitution and has passed multiple laws under various law-making authorities under the Tsawwassen Final Agreement. Tsawwassen First Nation's law-making is intimately tied to their connection to the land and waters, and thus to their traditions and culture. As such, projects within Tsawwassen First Nation's Territory potentially impact Tsawwassen First Nation's long-term goals for the community and interact with foundational values underpinning Tsawwassen First Nation governance.

Tsawwassen stewardship aspirations under Treaty: Stewardship, or šxʷkʷecxənəm in Halq'eméylem, is a core part of Tsawwassen values and, since the signing of the Final Agreement, Tsawwassen First Nation's stewardship aspirations have become part the Treaty relationship. The Final Agreement confirms the parties' shared intention to recognize and support Tsawwassen First Nation's aspirations to assert its place as stewards of its lands and resources. It also confirms the parties' shared intention to support the enhancement of Tsawwassen identity through the creation of new tools, processes and relationships that help advance Tsawwassen stewardship values. This is the basis for Tsawwassen's view that the impairment of Tsawwassen First Nation's ability to protect the land, water, and resources in their Territory is a negative impact on Tsawwassen First Nation's stewardship and cultural aspirations acknowledged under the Final Agreement.

Šxʷkʷecxənəm goes beyond a simple desire to ensure resource abundance. "Kʷec" means to look or watch, "xən" is to do with a foot, and "əm" means the person that is doing the action. Thus, a rough translation of šxʷkʷecxənəm to English would be a person that is looking or watching on foot - or acting as a lookout. From that perspective, šxʷkʷecxənəm stewardship is a relationship built on respect and gratitude for having healthy waters, lands and species in the territory that exist in equilibrium with the social, cultural and economic lives and activities of Tsawwassen members. Stewardship is integral to community health, prosperity, and self-determination.

Current challenges experienced by Tsawwassen First Nation in relation to harvesting, cultural well-being and stewardship aspirations under Treaty

Current conditions create challenges for the exercise of Tsawwassen's Rights: Tsawwassen First Nation notes that the current state of the Fraser River causes distress for the community in relation to cultural well-being, harvesting and stewardship aspirations. Tsawwassen First Nation

indicates that the conditions it identifies as necessary for the practice of Treaty rights relating to cultural keystone species present in the TMJ project area – including salmon, eulachon and sturgeon – are not being met. This in turn means that Tsawwassen's basic harvesting needs for FSC purposes are not being met. In addition, contamination from industrial activities in and around the lower Fraser River harms not only the animals and plants that rely on the river, but also Tsawwassen First Nation members who seek to protect this important area and limit opportunities to pass knowledge and values to younger generations.

Tsawwassen First Nation has noted that with every new development approved in areas used by Tsawwassen for cultural practices, more pressure is exerted on Tsawwassen First Nation's core values, constraining the Nation. Like any system, there is only so much pressure Tsawwassen First Nation values can withstand before they fracture and splinter apart. Tsawwassen First Nation has identified that the loss of core Tsawwassen First Nation values would be devastating because these values are a reflection of Tsawwassen First Nation's identity and nationhood.

Tsawwassen First Nation's perspective of existing regional and cumulative effect initiatives: Tsawwassen First Nation has shared great concern regarding the cumulative effects of development along the Fraser River and the uncertainty for the future of Tsawwassen's Treaty rights and culturally important resources as a result of ongoing cumulative effects. Tsawwassen has noted its disagreement that existing research and management initiatives relating to the Fraser River and resources within it are adequately effective in addressing the cumulative effects that the Nation is experiencing on the Fraser River and has noted that, in any event, these existing initiatives are not driven by Treaty needs or the Treaty relationship.

Importance of the TMJ Project Area to Tsawwassen First Nation

Tsawwassen First Nation has identified that the areas that will be subject to TMJ activities are unique, crucial and irreplaceable for Tsawwassen First Nation harvesting. Project activities directly overlap and interact with the limited areas in which Tsawwassen First Nation harvests certain resources important for food, social, cultural and economic reasons. For example, Tsawwassen First Nation has identified that project activities (i.e., jetty and shipping) overlap and interact with the only river system where Tsawwassen First Nation could harvest sturgeon (i.e., Lower Fraser), if populations were not so limited and vulnerable that Tsawwassen Member's ability to harvest sturgeon had not already been impacted. Tsawwassen First Nation has identified that TMJ activities overlap and interact with areas used to maintain Tsawwassen and that play a large role in Tsawwassen's vision for advancing it stewardship aspirations under Treaty.

14.7.4 POTENTIAL IMPACTS OF THE PROJECT TO TSAWWASSEN FIRST NATION'S TREATY RIGHTS AND OTHER VALUES (STEP 2 OF THE TSAWWASSEN METHODOLOGY)

The following sections focus on potential impacts of TMJ to Tsawwassen First Nation's Treaty Rights and values including:

- Right to harvest fish and aquatic plants;
- Rights to harvest wildlife and migratory birds;
- Right to gather plants;
- Rights to practice Tsawwassen First Nation culture; and
- Tsawwassen Governance and Stewardship Aspirations under Treaty.

In undertaking the assessment of impacts to Tsawwassen rights, the EAO considered relevant public information from other provincial and federal EA including the TMX and RBT2 projects and the relevant issues raised by Tsawwassen First Nation and members during the TMJ EA.

Tsawwassen First Nation provided a list of values and potential pathways of impact that could affect the exercise of rights by Tsawwassen First Nation to help in the evaluation of potential TMJ effects, noting that this list is not intended as a comprehensive description of each connection between Tsawwassen First Nation values. Within each category, a list of concepts and activities that, together, support the health and vibrancy of each category or value have been identified as a tool for identifying potential impact pathways.

<u>Culture</u> • Language • Sense of place and identity • Spirituality • Transmission of knowledge • Cultural keystone species • Cultural keystone locations→sacred places • Continuation of culturally significant activities and practices	<u>Stewardship and Governance</u> • Modern Treaty nation • Traditional knowledge • Preservation of lands, waters and resources • Interconnectedness with lands and waters • Role as stewards→spiritual, psychological and emotional components of identity • Intergenerational care and preservation→living on the land • Social relationships	<u>Harvesting</u> • Access to preferred areas and species • Confidence and trust in the resources • Experience of harvesting • Transmitting knowledge around harvesting intergenerationally • Harvesting in accordance with Indigenous knowledge and tradition • Safety while harvesting • Sustainable harvesting and interconnectedness of key species

The relationship between these values are shown in Figure 21, which reflects how Tsawwassen First Nation's rights and culture are inextricably linked. For example, harvesting crab is a component of the Tsawwassen First Nation value of harvesting, but this activity also represents an important element of Tsawwassen First Nation culture and way in which the Nation exercises its stewardship values to ensure its health, abundance and continuation for future generations of Tsawwassen Members. To assist with illustrating the relationship between the core Tsawwassen First Nation values identified for this impact assessment, Tsawwassen First Nation has shared the Venn diagram set out below.

Figure 21: Illustration to show the relationship between the Tsawwassen First Nation values

The following sections focus on potential impacts of TMJ to Tsawwassen First Nation's Treaty Rights and considers potential mitigations and accommodations to address identified impacts.

A. IMPACTS TO RIGHT TO HARVEST FISH AND AQUATIC PLANTS

Fish, as defined under the Tsawwassen Final Agreement, includes fish, intertidal bivalves and other shellfish, crustaceans, and marine animals (excluding cetaceans), the parts of these fish, as well as their eggs, sperm, spawn, larvae, spat, juvenile stages and adult stages. The Tsawwassen right to harvest fish and aquatic plants may be exercised in the Tsawwassen

Fishing Area. Marine resources are largely discussed in Chapter 9 of the Tsawwassen Final Agreement.

Potential Impacts and Other Concerns Raised by Tsawwassen First Nation

The EAO identified the issues raised and potential effects on fishing rights attributable to TMJ which, in the EAO's view, apply broadly to Indigenous Groups in Section 13.3.1. Additional specific issues raised by Tsawwassen First Nation are outlined below and include a discussion of proposed EAC conditions and recommended key mitigations under CEAA 2012. The EAO notes that the summary below is not a fulsome list of concerns raised by Tsawwassen First Nation but represents some of the key technical concerns that were identified during the EA.

- Tsawwassen First Nation raised concerns about potential effects to their fishers and the effect of vessels interfering with access to fishing areas during fish openings in the Fraser River and elsewhere in the marine shipping area. They also noted that access to preferred fishing locations for crab, salmon, groundfish, and rockfish would be affected by TMJ-related shipping activities. Tsawwassen described how industrial shipping activities pose challenges for TFN fishers as follows: "Time and space on the Fraser River are zero-sum; when development is there, harvesters are not. When commercial vessels are there, traditional vessels are not. When others are engaged in trade on the water, we cannot occupy that same space and time." Safety concerns play a large role in this: "Our 'mosquito fleet' can turn on a dime. Large vessels can't…The large commercial vessels need time to stop; we need time to pull our nets.";
- Tsawwassen First Nation is particularly concerned that there is no guarantee that TMJ-related shipping activities would be prohibited in and around DFO openings. As explained in the following quote from a Tsawwassen member: "In some cases, DFO openings are announced less than 24 hours before they begin out on the water; it is entirely possible, if not probable, that an opening and a commercial vessel transit will occur at the same time and the same place. And as more development occurs, the likelihood of those zero-sum interactions increases";
- At the time of drafting, Tsawwassen First Nation's perspective is that TJLP's mitigations and proposed KMMs and conditions are inadequate and non-responsive.
- Tsawwassen First Nation has stated that TJLP's proposed communication protocol for Indigenous fishers would not reduce or eliminate these impacts – it would merely inform Tsawwassen First Nation fishers of when and where they can expect to have their fishing rights curtailed.

- Tsawwassen First Nation has noted that this proposed mitigation measure also does not take into account the reduced availability of fish that may occur when fish avoid the marine jetty site and the shipping lanes. Such a proposal does not amount to meaningful mitigation, but instead places unacceptable increased burdens on Tsawwassen members. Tsawwassen First Nation notes that the proposed increases in marine traffic under the BVS would have potential to cause mortality and other behaviour changes to species of critical importance to Tsawwassen, including sturgeon.

- Tsawwassen First Nation has noted that the increase in the number of TMJ-related vessel movements per year under the BVS (i.e., total vessel call increase from 137 per year under the original Application Scenario up to 365 calls per year under the BVS, on average) represents a substantial expansion compared to the original Application Scenario, which has the potential to greatly exacerbate the negative impacts on Tsawwassen's rights in the Fraser River area. Tsawwassen First Nation emphasize, that since it is already exercising its rights under conditions of scarcity, any additional impacts from increases in Project-related marine traffic should be considered significant.

- TJLP has provided a record of consultation with Tsawwassen outlining its efforts to seek to mitigate potential effects to Tsawwassen. TJLP has also indicated that it is in ongoing discussions with Tsawwassen to mitigate the potential impacts to Tsawwassen. TJLP has provided a letter outlining commitments it has made to Tsawwassen and has indicated that it has expressly agreed to a number of the recommendations put forward by Tsawwassen. Other Tsawwassen recommendations are being proposed as key mitigation measures. Tsawwassen First Nation identified that, notwithstanding its many efforts to try to work with TJLP, TJLP has not agreed to Tsawwassen's requests for mitigation measures that are more certain, enforceable and protective of Tsawwassen's Treaty rights and interests. Tsawwassen First Nation also noted concerns with TJLP's approach to engagement that Tsawwassen has not encountered with other proponents in its territory relating to capacity funding, engagement practices, information sufficiency and mitigation discussions.

- TJLP has indicated that it has committed during the EA process that the Fish Habitat Offsetting Plan will take into consideration the design and success of similar fish habitat offsetting conducted within similar habitats/areas. Tsawwassen First Nation raised concerns regarding the fish habitat offset plan, including site selection and functioning, and regarding the lack of an offsetting plan to address non-habitat impacts (e.g., vessel strikes) to fish such as sturgeon. Tsawwassen First Nation requested a commitment that the

habitat offset plan be reflective of lessons learned from other offset plans in the region and that there be an offsetting plan for non-habitat impacts.

- Tsawwassen First Nation raised concerns regarding potential impacts on sturgeon and changes to their use of the site from TMJ. Concerns regarding the potential effects on fish from underwater noise, such as from construction and marine shipping causing behaviour changes, and direct mortality. With respect to mortality concerns, TJLP identified that it has committed to collaborating with Tsawwassen on a study of vessel strikes on sturgeon. Tsawwassen First Nation requested that TJLP conduct continuous monitoring via side scan sonar for large fish (such as sturgeon) for all construction activities that cause underwater noise and sought project conditions that would more clearly require adaptive management measures in response to monitoring and work under recovery strategies.
- Throughout Application Review Tsawwassen First Nation raised concerns relating to fish arising from the risks that the Project will create for the viability and recovery of culturally important species, such as eulachon and sturgeon, that are currently facing significant challenges and uncertainties. During the EA, and again most recently in its review of TJLP's BVSA Report, Tsawwassen First Nation identified a concern with the level of uncertainty associated with TJLP's findings that potential effect to harm and mortality to white sturgeon due to vessel strikes under the BVS would not have population-level effects. Tsawwassen First Nation expressed that it is inappropriate to approve projects that have the potential, regardless of the likelihood, to add incremental impacts to salmon, sturgeon and eulachon, where uncertainties regarding project effects to those species cannot be eliminated or where species recovery efforts have not yet reached a point where Tsawwassen First Nation can again fully exercise its Treaty rights. TJLP has proposed a number of mitigations related to concerns of potential impacts to White sturgeon, including a fish habitat offset plan and ongoing monitoring, and committed to funding and collaborating with Tsawwassen on a sturgeon study. Upon review of these, Tsawwassen First Nation requested that various proponent-led and Crown-led commitments be implemented to address the uncertainties relating to effect conclusions relating to fish and that TMJ activities not be allowed to commence until there is greater certainty that TMJ would not create any risk to salmon, sturgeon and eulachon. Among other things, Tsawwassen First Nation requested additional baseline data and assessment, a broader offsetting system, that TJLP conduct continuous monitoring via side scan sonar for large fish (such as sturgeon) for all construction activities that cause underwater noise and project conditions that require that TMJ activities be altered as new information becomes available.

- Tsawwassen First Nation submitted a literature review226 of studies and other sources of information on population demographics, vessel effects and dredging effects applicable to White sturgeon. This study provided further evidence that vessels and dredging can injure and kill sturgeon in riverine environments, including the Fraser River. Tsawwassen First Nation emphasized that the importance of the conclusion in the literature review that, according to their review, despite the uncertainty around the magnitude of vessel effects on sturgeon, the cumulative effects of all threats to sturgeon (including but not limited to habitat loss and degradation, dredging, gravel mining, fisheries bycatch, and vessel strikes) are at best hindering population recovery and at worst causing a population decline that may preclude the recovery of White sturgeon in the lower Fraser River to the point where it could sustain an annual harvest by Tsawwassen First Nation fishers. Tsawwassen First Nation has identified that no project-specific mitigation or monitoring has been proposed by the proponent for this concern.
- During the review of TJLP's BVSA Report, Tsawwassen First Nation identified there was uncertainty associated with TJLP's assumptions related to avoidance/displacement of fish in and around the smaller bunkering vessels and determined that TJLP's BVSA Report lacked evidence to conclude no changes in TMJ-related shading. Through the Working Group, Tsawwassen First Nation made requests for further detail on how the conclusions of no predicted changes to shading was determined. TJLP has indicated that it responded to this request for further detail on how it determined its conclusions. However, Tsawwassen First Nation notes that it still has concerns with TJLP's conclusions.
- Tsawwassen First Nation raised concerns regarding potential TMJ impacts on eulachon as eulachon has a high cultural importance to their communities supporting Tsawwassen First Nation with food, social, ceremonial and ecological values. Tsawwassen First Nation raised concerns regarding the potential of the site to support eulachon spawning and requested additional information about site conditions and an egg mat study to collect empirical evidence to inform the conversation. Tsawwassen First Nation noted that TJLP did not address Tsawwassen concerns relating to this information gap during the EA. In April, 2022, TJLP agreed in principle to provide funding to Tsawwassen First Nation to support a eulachon spawning habitat identification proposal to build the body of knowledge about

[226] Impacts of vessels on lower Fraser River White Sturgeon, November 6, 2020, funded by TJLP in response to TFN request.

the species in the Lower Fraser. As this proposal was developed bilaterally and would not be completed until after the conclusion of the EA, the EAO would not consider this as a recommended KMM under CEAA 2012.

- Tsawwassen First Nation raised concerns that water quality is subject to naturally high variation in total suspended solids and turbidity which would make it challenging to detect effects outside of that variability, and request for more water and sediment quality information and robust monitoring programs.

Mitigation measures through proposed conditions and KMMs

Proposed mitigations for potential impacts to Tsawwassen First Nation's right to fish include mitigations to reduce impacts to noise and visual quality in the CEMP and OEMP as well as the recommended key mitigations under CEAA 2012, specifically the Fish Mitigations to Reduce Harm and Mortality, Fish Habitat Offset Plan, and follow-up programs, Marine Communication Plan, Marine Access and Transportation Plan, Vessel Traffic Management Plan, and Cultural Heritage KMM. The summary below sets out additional information about the proposed EAC conditions and recommended KMMs under CEAA 2012 relevant to the effect pathways and concerns raised by Tsawwassen:

- TJLP has proposed developing a communication protocol as a measure for seeking to limit interruptions of treaty related fishing activity in the Fraser River. The EAO has recommended KMMs under CEAA 2012 for a Marine Communications Plan, a Marine Access and Transportation Plan and a Vessel Traffic Management Plan. These plans would identify the procedures of communication to Indigenous Groups and identification of mitigations to reduce disruptions caused by construction and operations for members of Indigenous Groups to carry out traditional use activities, including fishing for FSC purposes;
- In response to the assessment of TJLP's BVSA Report, the EAO is recommending additional mitigation measures intended to help reduce TMJ-related impacts to access for Tsawwassen First Nation when fishing in the lower Fraser River to Sand Heads, in particular during FSC fishing windows (See Section 13.3.1.1.3 of Part C for more information regarding the additional recommended mitigation measures as part of the Marine Access and Transportation Plan KMM). The EAO has also recommended a Cultural Heritage KMM under CEAA 2012, which would require TJLP to develop nation-specific measures to address the effects on tangible and intangible cultural losses caused by the construction and operation of TMJ, in consultation with those Indigenous Groups experiencing the

effects in the lower Fraser River (as described in this Report), and to consider developing or contributing to Indigenous-led programs to preserve and enhance cultural heritage.

- The EAO notes that in addition to several other requirements, as outlined in the Fish Habitat Offset Plan recommended as a KMM under CEAA 2012, the EAO is recommending that the offset plan require a review of previous offsetting plans in the region, where they are publicly available.
- As discussed in section 13.3.1, the proposed mitigation measures to address potential impacts to sturgeon and other fish at the TMJ site are in the recommended KMMs under CEAA 2012 for Fish Mitigations to Reduce Harm and Mortality, including monitoring for sturgeon presence prior to construction, applying additional mitigations if sturgeon are found to be present and undertaking mitigations, as specified by a QP, if works are to be conducted outside of the FLNRORD sturgeon least-risk window. Regarding the request for continuous monitoring during construction, TJLP clarified that noise at the TMJ site would likely discourage fish use from the site once construction has begun, such that it would not be necessary.
- Throughout the EA TJLP responded to Tsawwassen First Nation's questions about site conditions with information that, in their view, suggested the site would not provide suitable eulachon spawning habitat. At the request of Tsawwassen First Nation, TJLP has undertaken additional eulachon spawning habitat characterization in the spring of 2020 and an in-river eulachon spawning assessment during the 2021 spawning season to address uncertainty in the potential for eulachon spawning habitat within the proposed dredge area.
- TJLP developed the 2021 eulachon spawning assessment with input from TFN and modified the study based on Tsawwassen First Nation feedback including extending the duration and frequency of sampling, increasing the number of sampling sites and commencing sampling earlier in the year. This work between TJLP and Tsawwassen First Nation included meetings on the progress of the study and comparison of findings with Tsawwassen First Nation's own eulachon study that was occurring near-by, used Tsawwassen First Nation vessels and expertise to help conduct the study as well as providing opportunities for indigenous monitors all as requested by Tsawwassen First Nation.
- TJLP advised that the conclusions of the additional eulachon spawning assessment supports the previous conclusion and reduces the uncertainty concern raised by Tsawwassen First

Nation. Tsawwassen First Nation advises that the assessment supports the conclusion that eulachon could be negatively impacted by the Project and that further study and cumulative effect management measures pertaining to eulachon are necessary.

As discussed in section 13.3.1, based on the physical and biological information collected, TJLP concluded that habitat within the dredge area is low suitability spawning habitat due to the combination of the salt wedge, lack of suitable spawning substrate, elevated flow velocities that can occur during the spawning period, and lack of direct evidence of spawning. The proposed mitigation measures to address this concern are included in KMMs under CEAA 2012 recommended by EAO for Fish Mitigations to Reduce Harm and Mortality that would include mitigations with respect to timing of work and seasonal restrictions during operations on hydraulic suction and clamshell dredging to avoid entrainment of juvenile salmonids and eulachon. TJLP also concluded that current usage of the dredge area by adult eulachon is temporary and largely limited to the period of migration movements to upstream spawning locations. Fish Mitigations to Reduce Harm and Mortality would also require monitoring for fish presence during in-water works with criteria and triggers to modify or stop in water works, and underwater noise monitoring and mitigation activities; and

- In its conclusion the EAO is proposing a provincial condition for a Water Quality Management Plan to manage potential effects to TSS during Construction and Operations during in-water works. This plan would require TSS monitoring (via turbidity) and management actions if turbidity levels exceeded provincial turbidity water quality objectives. The EAO is also proposing provincial conditions for a Construction Environmental Management Plan and an Operational Environmental Management Plan (OEMP) and key mitigations measures under CEAA 2012 for erosion and sediment control and scour protection mitigations.

The EAO's Assessment of Potential TMJ Impacts to Tsawwassen Fishing Rights

The EAO assessment is that the construction and operation of TMJ, combined with existing conditions, is expected to result in a **moderate-to-serious level of impact** on Tsawwassen First Nation's Fishing Rights. This assessment takes into consideration available information, consultation with Tsawwassen First Nation, Tsawwassen First Nation's engagement with TJLP, TJLP's commitments, the EAO's proposed EAC conditions if an EAC is issued, and the recommended KMMs under CEAA 2012. The spatial extent of this impact would be regional and overlap with a preferred fishing areas in the lower Fraser and marine shipping areas that cannot be replaced with other areas in Tsawwassen's territory and that is already impacted by cumulative effects. The duration of this impact would be long term and extend for multiple generations, making reversibility uncertain. Vulnerable subgroups within Tsawwassen may be particularly affected by this impact, including elders, youth and male Tsawwassen harvesters whose status in the community is especially tied to fishing.

If there were to be an accident or malfunction in the Fraser River or marine shipping area or if TMJ were to cause a greater impact to fish and fish habitat than predicted, the Project impacts to Tsawwassen Fishing Rights would **increase**. Due to the limited duration of DFO fishing windows, if shipping activities were to overlap with a DFO fishing window, TMJ impacts to Tsawwassen Fishing Rights would be **serious**, due to Tsawwassen safety concerns and the potential loss of access of opportunities to fish during the DFO window(s) in that year.

The key factors that were considered in support of that conclusion are summarized below. The EAO notes that these contextual factors and pathways are interlinked and must be considered holistically when considering how these different factors interact (i.e., see Figure 21).

Linkages with Culture and Importance of the TMJ Area

- TMJ could impact Tsawwassen First Nation culture through reducing opportunities to conduct fishing at the TMJ site and in the shipping lanes. During construction, access to the TMJ site would be restricted for three years. During operations, Indigenous mariners and fishers would avoid entering and remaining in the marine terminal area due to the warning signs and notifications regarding elevated public risk, in particular, when vessels would be berthing, loading, or de-berthing at TMJ. As described in Section 13.3.1.1.2, the EAO predicts that under the BVS there could be potential for higher frequency of interactions to occur between TMJ-related vessels and Indigenous Groups engaging in vessel-based FSC fishing activities in the lower Fraser River during FSC fishing windows.

- Restricted access to the TMJ site during construction, and avoidance of the marine terminal area during operations (30 years minimum) could have an impact on the intergenerational transmission of culture and knowledge in those locations during the times when access is limited. It could also create a loss of connection to particular locations and reduce the sense of place and identify. If the TMJ site or areas in the shipping lanes include geographical names in hən̓q̓əmin̓əm̓/ hun'qum'i'num there could be an impact to language related to reduced opportunities to use the place names. Any impacts to fish and fishing could have associated impacts to Tsawwassen First Nation culture as their identity is closely connected to fish resources (particularly salmon, eulachon and sturgeon) and the practice of fishing in the Fraser River and in and around the marine shipping area.
- Tsawwassen First Nation has identified that project effects on harvesting would be intergenerational and therefore irreversible: TMJ activities will continue month after month, year after year, in a way that will interfere with the intergenerational transfer of knowledge. Given the multi-generational scope of TMJ, Tsawwassen First Nation's perspective is that it will have permanent impacts on the cultural components of harvesting.
- Tsawwassen First Nation identified that the location of TMJ and its zone of impact could cause high impacts to Tsawwassen First Nation culture because the areas affected by TMJ activities are crucial and irreplaceable for Tsawwassen cultural well-being. Tsawwassen First Nation has identified that TMJ will constitute a further step in the progressive alienation of Tsawwassen people from the Fraser River that has always been an essential area for maintaining their culture.
- Tsawwassen First Nation explained that TMJ activities are inconsistent with Tsawwassen First Nation's cultural practices that support harvesting, including sense of place, and cover a large, culturally important area: Teaching Tsawwassen's language, practices, and beliefs in culturally relevant places is integral to Tsawwassen First Nation culture and cultural retention. This depends on having a safe, welcoming environment and safe access to travel routes, harvesting areas and cultural sites. The ability to fish under certain conditions is profoundly connected to cultural transmission, the process whereby young fishers learn the value of camaraderie and community responsibility that is fulfilled by harvesting food to feed their people. These concerns are directly linked with considerations below regarding conditions required for harvesting. An increase in safety risks would also affect Tsawwassen's quality of experience.

- Tsawwassen First Nation Members fish in the vicinity of the TMJ site. The TMJ site and a portion of the shipping route are within the Tsawwassen Fishing Area defined in the Final Agreement. The MSA area overlaps the Tsawwassen Intertidal Bivalve Fishing Area.
- Some impacts to cultural practices related to fishing may be reduced by the mitigations to fish noted above, but the EAO acknowledges that the risks have not been fully eliminated.
- Some impacts to access and safety concerns may be reduced by the proposed Condition 17: Indigenous Cultural Awareness, Recognition and Mitigation in some contexts, it cannot fully eliminate the potential that TMJ activities will overlap with short DFO windows and, ultimately, that condition will not eliminate the need for Tsawwassen members to adapt their activities to avoid large inbound and outbound ships due to safety hazards. Given the lack of information and certainty relating to this condition, the EAO acknowledges that there will be project effects on Tsawwassen fishing after implementation of mitigation measures.

Linkages with Governance and Stewardship

- TMJ would be located within the Tsawwassen Fishing Area and, based on the potential impacts listed above, could impact their ability to govern and steward the area for current and future fisheries resources according to Tsawwassen laws, regulations and direction. Impacts to governance would be mitigated through Tsawwassen First Nation's continued involvement in the development of the plans discussed in the mitigations section below, but Tsawwassen has expressed the view that the draft conditions do not reflect the government-to-government relationship intended by Treaty because they are premised on TMJ proceeding in the absence of certainties sought by Tsawwassen and because they have, in Tsawwassen's assessment, limited ability to require necessary adaptive management measures to be undertaken. The EAO also proposes an engagement and reporting provincial condition to offer opportunities for ongoing engagement and issues resolution with TJLP.

Conditions Supporting Harvesting

- **Fish and Fish Habitat**
  - The EAO's conclusions in the Fish and Fish Habitat chapter in Part B that TMJ construction (just over three years in duration) and operations (annual dredging) are likely to result in low magnitude adverse residual effects to fish habitat and potential behavioural responses by fish species at the TMJ site, and low magnitude and frequency impacts to sturgeon due to potential vessel strikes. No residual effects are predicted to fish and fish habitat in the MSA area. However, there is uncertainty with these conclusions and, if these activities have a greater biophysical impact than predicted, the resulting impacts on Tsawwassen First Nation Fishing Rights would likely increase.
  - As described in the section on Fish and Fish Habitat in Part B (Section 5.6), the EAO does not predict changes in TMJ shading due to increase in bunker vessels, primarily because there is a lack of vegetation within dredge pocket, and the effectiveness of the proposed Project design measures, such as such as using grating in the trestle structure to allow for light penetration. The EAO also predicts that underwater noise from vessel traffic associated with TMJ would be within normal ranges of other marine activities, and effects to fish and fish habitat from TMJ-related vessel noise would not be measurable under both operating scenarios.
  - The lower Fraser River is highly industrial and the TMJ site is previously disturbed. The MSA area is a heavily utilized marine environment. These factors increase the seriousness of impact of TMJ on Tsawwassen's Treaty rights to harvest fish.
  - Tsawwassen First Nation has identified that is it currently unable to meet its community harvesting needs with respect to salmon, eulachon and sturgeon. Tsawwassen First Nation members have been observing the changing conditions across their territory for many years, and have found the ongoing decline of Fraser River salmon to be particularly troubling.
- **Access to Fishing Resources**
  - In the Current Use of Lands and Resources for Traditional Purposes chapter of Part B, the EAO concludes that TMJ would result in varying residual effects to access to fishing areas adjacent or within the TMJ area and within shipping lanes out to the 12 nm territorial limit. The predicted residual effects to access would be more pronounced during berthing and fueling of the LNG Carriers and bunker vessels at the TMJ jetty and more likely to occur in areas where topography, important fishing sites, and/or the shipping lanes becomes

increasingly restrictive, such as within the tide-influenced south arm of the Fraser River or preferential fishing sites located within shipping lanes. The EAO also concludes in the Current Use chapter of Part B, that TMJ would, combined with current conditions, contribute to significant cumulative effects to access for some Indigenous fishers requiring access to restrictive fishing areas in the lower Fraser River or within shipping lanes in the MSA.

- During construction, access to the TMJ site would be restricted for three years. During operations, Indigenous mariners and fishers would avoid entering and remaining in the marine terminal area, in particular, when vessels would be berthing, loading, or de-berthing at TMJ. These restrictions would cause a continuous constraint on when and how Tsawwassen can engage in fishing activities in a manner it views as safe and culturally appropriate. The EAO's conclusions in the Current Use section of Part B found that regularly occurring (i.e., up to one vessel call per day, on average, under the BVS) and short-duration vessel movements to pass through known fishing areas in the Fraser River and Salish Sea. The EAO acknowledges that, from the experience of Tsawwassen members, the addition of regular traffic associated with large vessels will be a continuous constraint.
- Of particular consequence is the potential for shipping activities to overlap with short harvesting windows established by DFO. Tsawwassen First Nation has identified that fishing windows are limited to only a few hours once a week between June to October. As a result, many Tsawwassen First Nation members are able to harvest salmon only every four years rather than every year as they did previously.
- While the Communications Protocol will result in dialogue that may assist with reducing some occurrences of conflict with Tsawwassen First Nation access, there will be an annual risk that harvesting windows could be completely lost due to the overlap of fishing windows and TMJ-related activities. This risk cannot be eliminated. Due to the limited duration of DFO fishing windows, if shipping activities were to overlap with a DFO fishing window, TMJ impacts to Tsawwassen Fishing Rights would be **serious**, due to Tsawwassen safety concerns and the potential loss of access of *any* opportunity to fish during the DFO window(s).
    - Based on feedback received from Tsawwassen First Nation, and other Indigenous Groups, and the assessment of TJLP's BVSA Report, the EAO has recommended additional mitigation measures to help reduce TMJ-related impacts to access for fishing in the lower Fraser River, in

particular during FSC windows, through refinement of the Marine Access and Transportation Plan (KMM). The intention with these refinements is to create dialogue and more opportunities for reducing potential interactions between shipping activities and Tsawwassen First Nation harvesting. Tsawwassen has identified limitations with these additional measures with respect to protection of Tsawwassen Fishing Rights due to the lack of certainty for Tsawwassen First Nation, the lack of alignment with how DFO manages fishing windows and TJLP's multi-year refusal to adopt more protective measures for Tsawwassen fishing rights identified by Tsawwassen First Nation during their discussions with TJLP about the Marine Access and Transportation Plan. The EAO acknowledges these concerns and has taken them into account when assessing the impacts of the Project on Tsawwassen First Nation's Fishing Rights.

- The EAO acknowledges Tsawwassen's view that mitigation measures that involve Tsawwassen First Nation members altering their fishing times and locations to accommodate TMJ should not be considered as mitigation and, in fact, may increase negative impacts from TMJ. As described above Tsawwassen First Nation have identified that there are a variety of potential ways that increased vessel traffic, even with synchronization and the implementation of the Marine Access and Transportation Plan and other KMMs, could further impede harvesting by Tsawwassen First Nation on the Fraser River.
- During its review of TJLP's BVSA Report, Tsawwassen First Nation identified that there are a variety of potential ways that increased vessel traffic, even with synchronization, could further impede harvesting by Tsawwassen on the Fraser River including greater potential effects to fish and fish habitat due to increased noise and risks of spills or accidents.
    - Tsawwassen First Nation also identified that synchronous passage could detract from sense of place for Tsawwassen members, which may then reduce access to fish by avoidance of the shipping lanes.
    - Tsawwassen First Nation made requests for more information about how the mitigation would work in practice, and more details on maximum distances related to the proposed synchronous passage. TJLP has indicated that it responded to Tsawwassen First Nation's

information request with a presentation outlining proposed mitigation measures, as well as technical responses through BVSA engagement. Tsawwassen First Nation notes that the additional information has not addressed the substantive concern with impacts from bunker vessel activities.

- As described in Section 13.3.1.1.3 of Part C, the EAO acknowledges that synchronizing bunker vessel traffic with existing traffic does not completely mitigate effects, including potential access disruptions for Tsawwassen First Nation during FSC openings and other cultural activities.
- The EAO understands that Tsawwassen views that the EAO's proposed draft conditions and updated recommended KMMs under CEAA 2012 have inherent limitations, and still fail to provide necessary guarantees respecting Tsawwassen's meaningful right to harvest under Treaty and other Project effects on Tsawwassen's Treaty Rights and interests.

- **Experience and Safety While Fishing**
  - The EAO concluded potential negligible to low magnitude impacts due to a change in noise and visual quality during construction and to changes in visual quality during operation of TMJ in Part B of this Assessment Report. Potential negligible impacts from TMJ-related vessel traffic during operations affecting visual quality, noise and vessel wake (with an increasing magnitude of effect the closer one is to the vessels). Potential impacts to safety of small vessels from large vessels and wake effects as assessed in the Accidents and Malfunctions and Effects of the Environment section of Part B.
  - In its review of TJLP's BVSA Report, Tsawwassen First Nation identified a concern that the report lacked information on risk outcomes of potential spills related to filling bunkering vessels under the BVS, and Tsawwassen First Nation also requested more detailed accounting of risks, and for TJLP to identify and address any incremental risks associated with LNG spills under the BVS. As described in the section on Accidents and Malfunctions in Part B (Section 9.3), TJLP clarified that the risk of a loss of LNG containment during loading operations is similar under the BVS to what was originally assessed in the Application scenario. The EAO is of the view that the potential accidents and malfunctions associated with TMJ, including release of LNG, has been adequately identified and assessed for this EA, including operations under the BVS and Application Scenario.

- Tsawwassen First Nation has identified that TMJ activities are inconsistent with Tsawwassen First Nation's cultural practices, including sense of place, and cover a large, culturally important area: Teaching Tsawwassen's language, practices, and beliefs in culturally relevant places is integral to Tsawwassen First Nation culture and cultural retention. This depends on having a safe, welcoming environment and safe access to travel routes, harvesting areas and cultural sites. The ability to fish under certain conditions is profoundly connected to cultural transmission, the process whereby young fishers learn the value of camaraderie and community responsibility that is fulfilled by harvesting food to feed their people.

Perspective on Cumulative Effects

- There are already five Clear Transit Areas between Tilbury Island and Sand Heads. These are areas where LNG carriers must be unimpeded by any other vessel while transiting through. Deep sea vessels and LNG carriers also have priority status over other smaller vessels transiting in either direction through the South Arm of the Fraser River.
- The Fraser River is highly industrial and the TMJ site is previously disturbed. The MSA area is a highly utilized marine environment.
- Tsawwassen First Nation have stated that they cannot meet their eulachon needs, salmon are below levels Tsawwassen First Nation view as needed to exercise their treaty rights to harvest fish, and they no longer harvest sturgeon due to the state of the resource.
- Tsawwassen First Nation have indicated its reasonable opportunity to harvest fish has been significantly impaired and denied due to pressures from cumulative effects.
- Tsawwassen First Nation have shared that their important cultural practices, which are necessary for Tsawwassen First Nation's survival, cannot occur in conditions where marine traffic is already at an unacceptable level and where approximately 274 additional vessel movements per year are contemplated as part of TMJ. For example, Tsawwassen First Nation have identified that their ability to revive their traditional fishing practices, such as reef net fishing and the use of fishing weirs, is not feasible in an environment saturated with marine traffic.

As noted above, these considerations and pathways must be considered collectively. Tsawwassen First Nation has shared that the connection between culture, stewardship and governance are key in considering how TMJ may impact Treaty rights. For example, Tsawwassen First Nation has shared that loss of harvesting opportunities would also adversely impact the socio-economic health of Tsawwassen members. The EAO's conclusion of medium-to-high impacts of TMJ on Tsawwassen First Nation's right to fish takes into consideration the interaction of these factors.

B. IMPACTS ON RIGHT TO HARVEST WILDLIFE AND MIGRATORY BIRDS

Potential Impacts and Other Concerns Raised by Tsawwassen First Nation

TMJ is located within and TMJ-related vessels cross both the Tsawwassen Wildlife Harvest Area and Tsawwassen Migratory Bird Harvest Area. Under the Tsawwassen Final Agreement, wildlife includes all vertebrate and invertebrate animals, including mammals, birds, reptiles, and amphibians, and the eggs, juvenile stages and adult stages of these animals. Migratory birds mean birds, as defined under federal law enacted further to international conventions, and includes their eggs.

Tsawwassen First Nation's rights to harvest wildlife and migratory birds includes harvesting for domestic purposes and to trade or barter wildlife, wildlife parts, and migratory birds among themselves or with other Aboriginal people resident in BC. Harvested wildlife, wildlife parts (including meat and furs), migratory birds, and inedible migratory bird by-products (including down) may also be sold if the sale is permitted by federal, provincial, and Tsawwassen law. Wildlife and migratory bird harvesting rights may be exercised on private land (with the owner's permission) and, in the case of migratory birds, within National Wildlife Areas (with Canada's permission). With respect to wildlife harvesting specifically, the Tsawwassen Final Agreement provides compensation for the "limited existing opportunity to harvest Wildlife and [there is] the likely future diminution or loss of any meaningful opportunity to harvest Wildlife in the Tsawwassen Wildlife Harvest Area". Tsawwassen First Nation have noted that the amount of development within the territory of Tsawwassen has left scarce locations for Tsawwassen members to exercise their hunting rights.

Tsawwassen First Nation hunters have identified preferred migratory bird harvesting areas (particularly for ducks and geese) including Lulu Island, the small islands, the lower Fraser River as well as the tidal flats at Boundary Bay. Harvesting of wildlife and migratory birds have been recorded at Galiano, Saltspring, Mayne, Pender and Saturna islands.

The EAO understands that, at present, Tsawwassen First Nation is not harvesting any wildlife or migratory bird species for which a conservation risk has been identified. Harvesting of migratory birds is permitted throughout the year. Higher concentrations times for harvesting usually occur in the fall and winter and usually end during the early spring, due to population trends and migratory patterns.

During its review of TJLP's BVSA Report, Tsawwassen First Nation identified concerns regarding the uncertainty in understanding the thresholds for avoidance resulting in changes of behaviour or distribution of marine birds in response to increased vessel traffic under the BVS, and identification of stewardship value related to aquatic birds.

Mitigation measures through proposed conditions and KMMs

Proposed conditions to mitigate impacts to Tsawwassen First Nation's Right to Harvest Wildlife and Migratory Birds are:

- The Vegetation and Wetland Management and Wetland Offsetting Plan, and the wildlife and wildlife habitat management, light management, and noise management components of the CEMP and OEMP, all of which would require consultation with Indigenous Groups;
- The EAO is also proposing these mitigations as KMMs under CEAA 2012 which would include requirements for migratory birds, lighting, noise and wildlife and wildlife habitat management and monitoring, and a Wetland Compensation Plan; and
- All vessels would adhere to the Marine Regulations and Legislation regulating vessel noise and lighting.

The EAO acknowledges Tsawwassen First Nation's opinion that TJLP has provided insufficient information about proposed mitigation plans for them to be considered mitigations. In Tsawwassen First Nation's opinion, none of the mitigation measures appear to be responsive to the concerns raised about cultural well-being.

The EAO's Assessment of Potential TMJ Impacts to Tsawwassen Rights

In consideration of the available information, consultation with Tsawwassen First Nation, Tsawwassen First Nation's engagement with TJLP, TJLP's commitments and the EAO's proposed EAC conditions if an EAC is issued, and the recommended KMMs under CEAA 2012, TMJ is expected to result in a **minor** impact on Tsawwassen First Nation's Right to Harvest Wildlife and Migratory Birds. The likelihood, spatial extent and frequency of this impact are understood to be more limited than fishing impacts, with less uncertainty about reversibility.

The key factors that were considered in support of that conclusion are summarized below.

- The EAO evaluated the potential effects on hunting and trapping rights attributable to TMJ which apply broadly to Indigenous Groups. These are summarized in section 2.2.3. The EAO is satisfied that the key impacts to biophysical components resulting in changes to wildlife and vegetation quantity and quality, changes in access to hunting and trapping areas, and changes to social, cultural, and spiritual values associated with traditional hunting and trapping activities summarized in section 2.2.2 apply to Tsawwassen First Nation. Based on comments submitted during Application Review, the EAO understands that Tsawwassen First Nation did not raise specific issues and concerns with potential TMJ impacts relating to harvesting wildlife and migratory birds.

The key factors that were considered in support of the EAO's conclusion are summarized as follows:

Linkages with Culture and Importance of TMJ Area

- Tsawwassen First Nation report that they do not currently harvest wildlife or migratory birds within the TMJ site. The Fraser River is highly industrial and the TMJ site is previously disturbed. The MSA area is a highly utilized marine environment.
- Tsawwassen First Nations identified preferred migratory bird harvesting areas, including Lulu Island, the small islands, the lower Fraser River, the tidal flats at Boundary Bay and report harvesting wildlife and migratory birds at the Gulf Islands. Tsawwassen's Territory used to host an abundance of healthy resources on which Tsawwassen First Nation relied, including migratory birds. To the extent they are able to, Tsawwassen Members continue to rely on these resources today.
- Any impacts to wildlife and migratory birds could have associated impacts to Tsawwassen First Nation culture. TMJ could impact Tsawwassen First Nation culture

through reducing opportunities to harvest wildlife and migratory birds at the TMJ site and when ships are transiting through a particular area.

- Impacts to culture would be reduced by the mitigations for wildlife and migratory birds noted above, and through the proposed Indigenous Cultural Awareness, Recognition and Mitigation Condition.

Linkages with Governance and Stewardship

- TMJ would be located within the Tsawwassen Wildlife Harvest Area and Tsawwassen Migratory Bird Harvest Area and, based on the potential impacts listed above, could impact Tsawwassen First Nation's ability to govern and steward the area for current and future wildlife and migratory bird resources according to Tsawwassen laws, regulations and direction.
- Impacts to governance would be reduced through Tsawwassen First Nation's involvement in the development of the plans in the mitigations section above. The EAO also proposes an engagement and reporting provincial condition to offer opportunities for ongoing engagement and issues resolution with TJLP.
- Tsawwassen First Nation has identified that the impairment of stewardship values will have a broad geographic effect, as Tsawwassen First Nation cannot simply go somewhere else to escape the effects of TMJ. They note that the impact of this is made more severe by the reality that TMJ may cause Tsawwassen First Nation's lands on the Fraser River to lose value as a focal point for advancing its stewardship aspirations.

Conditions Supporting Harvesting

- The EAO concluded that there would be negligible to low magnitude adverse residual effects to wildlife and wildlife habitat at the TMJ site (see Wildlife section in Part B), due to loss or alteration of wildlife habitat, sensory disturbance from noise and light, and mortality.
- The EAO concluded that there would be negligible to low magnitude residual effects to marine birds in the MSA area (see Wildlife section in Part B) related to mortality. Wetland and riparian ecosystem habitat restoration and creation would result in an overall gain on 0.97 ha.
- Construction (just over three years in duration) and operation (30 years) is unlikely to cause disruptions to Tsawwassen First Nation's access to the Tsawwassen Wildlife Harvest Area and the Tsawwassen Migratory Bird Harvest Area.

- Potential impacts to experience in the vicinity of the TMJ site and along the shipping route due to a change in noise and visual quality (see respective Part B sections) during construction and operations which are anticipated to be negligible to low in magnitude in the Fraser River and Salish Sea.
- For harvesting of marine birds from the water, the small number of TMJ-related vessels relative to current vessel traffic are predicted to have a negligible effect in terms of access.
- As described in Section 13.3.2 of Part C, the EAO did not identify any changes to relevant pathways of effects to Aboriginal hunting, gathering, and trapping rights in the BVSA, including the Wildlife, Wildlife Habitat and Marine Birds VC.
- The EAO is of the view that the potential effects of TMJ during both construction and operations stages would not result in a denial of Tsawwassen First Nation's reasonable opportunity to harvest migratory birds in the Tsawwassen Migratory Bird Area, as per Chapter 11 of the Tsawwassen Final Agreement.

C. IMPACTS ON RIGHT TO GATHER PLANTS

Potential Impacts and Other Concerns Raised by Tsawwassen First Nation

Plants, as defined under the Tsawwassen Final Agreement, includes all flora and fungi but does not include aquatic plants (included in the definition for fish) or trees except for their bark, branches and roots. Tsawwassen First Nation members reported that they used to be able to harvest many of traditional plants within their territory, and traditional plant uses and harvesting used to be passed down through the generations. Members noted that many traditional plants have been subjected to invasive plants, for example invasive blackberries species have replaced traditional berries species, including local blackberries, huckleberries, and thimbleberries. Tsawwassen First Nation members noted that they need to harvest stinging nettle and cedar to make nets and need access to everywhere they used to travel with the seasons to maintain their culture and way of life.

The EAO's Assessment of Potential TMJ Impacts to Tsawwassen Rights

In consideration of the available information, along with TJLP's commitments and the EAO's proposed EAC conditions if an EAC is issued, and the recommended KMMs under CEAA 2012, TMJ is expected to result in **negligible impacts** on Tsawwassen First Nation's Right to Gather Plants. The Tsawwassen Plant Gathering Areas are not located within the TMJ area and there is no indication that the spatial extent of TMJ-related impacts would extend to plants in the

Tsawwassen Plant Gathering Areas (nearest area in Burns Bog is approximately 3 km away from the TMJ-site).

The key factors that were considered in support of the EAO's conclusion are summarized as follows:

- TMJ is not located within a Tsawwassen Plant Gathering Area, and the nearest Plant Gathering Area is approximately 3 km southeast of TMJ in Burns Bog.

The EAO evaluated the potential effects on gathering rights attributable to TMJ which apply broadly to Indigenous Groups. These are summarized in Section 13.2.3.

D. IMPACTS ON TSAWWASSEN FIRST NATION CULTURAL VALUES

Potential Impacts and Other Concerns Raised by Tsawwassen First Nation

Chapter 14 (Culture and Heritage) of the Treaty provides that: *Tsawwassen First Nation has the right to practice the culture of Tsawwassen First Nation, and to use the Hun'qum'i'num language, in a manner that is consistent with this Agreement.* The critical importance of the Salish Sea and the Fraser River to Tsawwassen First Nation's culture, and the relationship between Tsawwassen First Nation's core values (including culture) (Figure 21) are reflected in earlier sections of this chapter; as such, this section will focus on specific cultural components. This section should be considered in conjunction with the cultural values and interactions with those values referenced throughout this chapter.

The Tsawwassen Final Agreement identifies cultural and historic sites of significance to Tsawwassen First Nation to be designated as provincial heritage sites, including:

- *ƛ'eqtinəs (or Tl'ektines* identified as DgRs-17 in the Tsawwassen Final Agreement Appendices), which is directly across the Fraser River about 400 m from the TMJ jetty site;
- *Skʷəkʷexʷqən* (or "Poplar Island" identified as DhRr-000 or "not registered" in the Tsawwassen Final Agreement Appendices), which is roughly 8 km upstream of the TMJ jetty site in the North Arm of the Fraser River; and
- *Xʷlic'əm* (or "Brunswick Point" identified as DgRs-35 in the Tsawwassen Final Agreement Appendices), which is located roughly 8 km downstream of the TMJ jetty site at Brunswick Point on Canoe Pass.

Tsawwassen First Nation Members continue to use the Fraser River for transportation, recreation, and cultural purposes. Members navigate the Fraser River using powered fishing vessels, pleasure craft, and unpowered craft, such as canoes, to get to and from other First Nation communities, sites for harvesting activities, and ceremonial activities, such as the First Salmon ceremony.

Tsawwassen First Nation reports that the viewscape at culturally important locations is tied to the quality of experience that Tsawwassen Members have when engaging in ceremonial and spiritual activities or during those times when Tsawwassen First Nation Members are observing and documenting changes in the environment to transmit knowledge to younger generations.

Another component of a healthy Tsawwassen First Nation culture includes having a strong Tsawwassen First Nation language. The Tsawwassen language is indelibly linked to the lands and waters of Tsawwassen First Nation Territory. The language is not only a way of communicating. It describes place names and their uses, and ways of relating to the lands and waters, and to other people.

Integral to Tsawwassen First Nation culture and cultural retention is being able to teach Tsawwassen First Nation language and practices and beliefs in culturally relevant places. This in turn depends on having a safe, welcoming environment and safe access to travel routes, harvesting areas and cultural sites.

Tsawwassen First Nation expressed a variety of concerns relating to cultural heritage including:

- The further industrialization of the Fraser River, particularly with the addition of LNG vessels, could further remove the community's immediate connection and access to the Fraser River;
- Tsawwassen is concerned they will experience a loss of cultural landscape;
- Intergenerational transfer of cultural knowledge, as well as transmission of place-based language, could be interrupted for an extended time period because of safety concerns and impairment of the Nation's connection to the River;
- TMJ may impede access to and connection with culturally relevant species, specifically salmon, sturgeon, eulachon and Southern Resident Killer Whale;
- Increased ship traffic or vessel size would pose safety hazards to Tsawwassen vessels and members would be required to adapt their activities to avoid large inbound and outbound ships rather than following approaches rooted in Tsawwassen culture and needs;

- Limits on access could impede sharing of traditional foods within the community, which supports a variety of social and cultural norms and practices;
- Any impacts to fish and fishing could have associated impacts to Tsawwassen First Nation culture as their identity is closely connected to fish resources (particularly salmon, eulachon and sturgeon) and the practice of fishing in the Fraser River and in and around the marine shipping area; and
- Project activities may interfere with access to historically and culturally important sites.

Mitigation measures through proposed conditions and KMMs

Proposed conditions to mitigate impacts to Tsawwassen First Nation's cultural values, include the development of the Cultural and Archaeological Resources Management Plan for the TMJ site, the light management, noise and vibration management, and air quality management components of the CEMP and OEMP, an Indigenous Cultural Awareness, Recognition and Mitigation condition, as well as the recommended key mitigations under CEAA 2012, specifically the Marine Communication Plan, Marine Access and Transportation Plan, and Vessel Traffic Management Plan to reduce impacts to access.

As outlined in Section 13.3.2 to ensure access to cultural and archaeological sites at the TMJ site are not disrupted during construction and operations, the EAO proposes a condition for a Cultural and Archaeological Resources Management Plan which would involve TJLP addressing Indigenous concerns around access, both in terms of ensuring Indigenous access to sites during construction and prohibiting unauthorized access by the public. The Heritage Resources chapter of Part B provides further details on the Cultural and Archaeological Resources Management Plan.

The EAO notes that where intact or disturbed resources are found at the TMJ site, TJLP would be required to manage them in accordance with the HCA, employ a Chance Find Protocol and carry out all activities that would affect those resources in compliance with any permits issued for the HCA. The EAO is also recommending KMMs under CEAA 2012 for a Marine Access and Transportation Plan, which would identify mitigations to reduce disruptions to access caused by construction and operations for members of Indigenous Groups to carry out traditional use activities.

As described in the Marine Mammal section in Part B, the EAO recommends the Marine Mammal Management Plan as well as the Vessel Traffic Management Plan as KMMs under CEAA 2012. The Marine Mammal Management Plan would include identification of the activities that could cause injury or behavioural change disturbance to marine mammals, the time periods when marine mammal occupancy is anticipated as well as identification of the TMJ activities that must cease or not start where marine mammals are identified in the area. The Vessel Traffic Management Plan would include identification of how TMJ is participating in regional environmental management measures to protect Southern Resident Killer Whale, such as the federal Ocean Protection Plan Whales Initiative.

The EAO acknowledges that Tsawwassen First Nation is of the opinion that TJLP has provided insufficient information about proposed mitigation plans for them to be considered mitigations. In Tsawwassen First Nation's opinion, none of the mitigation measures appear to be responsive to the concerns raised about cultural well-being.
In response to concerns raised by Tsawwassen First Nation, as well as some other Indigenous Groups, the EAO has also recommended a Cultural Heritage KMM under CEAA 2012, which would require TJLP to develop nation-specific measures to address the effects on tangible and intangible cultural losses caused by the construction and operation of TMJ, in consultation with those Indigenous Groups experiencing the effects in the lower Fraser River, as described in the EAO's Assessment Report.

The EAO's Assessment of Potential TMJ Impacts to Tsawwassen Rights

Given the high value placed on the lower Fraser River and in consideration of the available information and proposed mitigation measures, the EAO is of the view that TMJ, combined with existing conditions, is expected to result in a **serious** impact to cultural values and cultural well-being of the Tsawwassen First Nation. The spatial extent of this impact would be regional and overlap with an area that is understood to be essential for TFN cultural well-being and that is already impacted by cumulative effects.

Project impacts to the transfer of cultural values and knowledge, which require connections to the Fraser River and Marine Shipping Area one generation to the next, would be potentially irreversible given the likely the ongoing and intergeneration duration of the impaired connection to traditional activities and the cultural values in the Fraser River. Vulnerable subgroups within Tsawwassen may be particularly affected by this impact, including elders and youth.

The EAO considered the issues raised and evaluated the potential effects on cultural values attributable to TMJ which apply broadly to Indigenous Groups. These are summarized in Section 13.3.3. The key factors specific to issues raised by Tsawwassen First Nation that were considered in support of that conclusion are summarized as follows:

Linkages with Culture and Importance of the TMJ Area

- The EAO's conclusions in the Heritage Resources section of Part B found no residual effects to paleontological resources or historical and physical heritage, and no residual effects on Heritage Resources from erosion due to wake effects along the shorelines of the Fraser River or Salish Sea;
- Tsawwassen evidence shows that the Project will further exacerbate the loss of connection with an important cultural area. The cultural connection to these resources may be adversely impacted by Project activities and the communication protocol will only, at best, partially mitigate these impacts. The geographic extent of impacts will include a local area that is a cultural keystone location and a broader regional context that is utilized to support cultural values. In particular, access may be impacted to a site of cultural significance in the vicinity of the TMJ site (i.e., *Tl'ektines* which is across the Fraser River about 400 m from the TMJ jetty site);
- The TMJ site is located in a particularly culturally important area within Tsawwassen Territory, the Fraser River. Tsawwassen First Nation has shared that the Fraser River a source of physical and spiritual nourishment and is intrinsic to the health and well-being of Tsawwassen First Nation's culture. Given the foundational role of Tsawwassen's relationship to the aquatic environment, any negative impacts to the marine and riverine systems in Tsawwassen's Territory risk fundamentally altering Tsawwassen's culture; and
- During the TMJ EA Tsawwassen First Nation raised concerns about the cumulative effects to Southern Resident Killer Whales (SRKW) not only to individual SRKWs, but the future viability of the entire population in the event that current efforts to mitigate adverse effects are unsuccessful. Through the RBT2 process, Tsawwassen First Nation explained that SRKW are central to Tsawwassen First Nation culture and identity. A disruption to this species constitutes a strong negative impact to Tsawwassen First Nation, given the importance of this species to the members. Tsawwassen First Nation has shared that effects on SRKW directly threaten Tsawwassen First Nation cultural well-being and identified that the recent Review Panel Report for the RBT2 Project stated that any effect to the SRKW population would result in an adverse effect to Tsawwassen First Nation's cultural practices and

cultural heritage. In Part B section on Marine Mammals, the EAO concluded that TMJ would not result in significant residual effects to Marine Mammals; however, the EAO noted that the current baseline of cumulative effects to SRKW are already high and that TMJ would contribute additional residual effects from shipping noise and potential avoidance behaviour by SRKW to ships, such that cumulative effects to SRKW are considered significant.

- The EAO acknowledges that a Cultural Heritage KMM under CEAA 2012 will not completely mitigate these effects.

Linkages with Governance and Stewardship

- Tsawwassen First Nation has shared that they are stewards of their entire Territory. Tsawwassen First Nation's health is a balance of physical, cultural, and spiritual well-being and is tied to Tsawwassen First Nation stewardship values, which are interwoven with several components of Tsawwassen Member's way of life. Stewardship is integral to community health, prosperity, and self-determination. Tsawwassen First Nation's goal is for their members to be united with a strong connection to their culture, the land, and its resources; and
- Tsawwassen First Nation has identified that their law-making is rooted in their connection to the land and waters and tied to their traditions and culture. Any impairment of Tsawwassen First Nation's ability to protect the land, water, and resources in their Territory is a negative impact on Tsawwassen First Nation's long-term goals for their community.

Site Use and Access:

- During construction, access to the TMJ site would be restricted for three years. During operations, Indigenous mariners and fishers would avoid entering and remaining in the marine terminal area due to the warning signs and notifications regarding elevated public risk, in particular when vessels would be berthing, loading, or de-berthing at TMJ ;
- Even with a communication protocol, the EAO understands that Tsawwassen has identified that its members would alter how they access the Fraser for cultural practices and are likely to experience limits on their access. The potential effect would persist beyond one generation; and

- Because of the role that the Fraser River plays in cultural transmission, an impact to TFN access to engage in cultural practice will reverberate through a broad swath of components that support TFN culture.

Experiential:

- The ability for Tsawwassen to safely and peacefully use the lands and waters for traditional purposes affects their quality of experience which is important for cultural practices and teaching. There would be noticeable disturbances to Tsawwassen's current use of the River and resources within it for traditional purposes that cannot be fully mitigated;
- If TMJ is approved, new physical infrastructure and changed vessel movements will become a permanent feature of the Tsawwassen landscape, both of which will alienate Tsawwassen Members from areas that are important for maintaining cultural connections to and practice in their territory;
- Given the high value placed on the Fraser River by Tsawwassen, Tsawwassen First Nation has identified that TMJ is likely to affect the ability of Tsawwassen to maintain their connection to sturgeon, eulachon and create additional fears for the future of salmon;
- The EAO's conclusion in the Current Use Chapter of Part B acknowledges that concerns that noise and visual disruptions and concerns about safety could then lead to reduced opportunities for cultural transmission including Indigenous language acquisition by younger generations. Tsawwassen is a young and growing Nation. More than 40% of their Members are less than 20 years old, and over 70% of the Members are under 40. This population is particularly at risk of loss of cultural knowledge; and
- TFN members have noted that the presence of large ships makes them more fearful about bringing – and so less likely to bring – youth out on to the water to learn. While on the water, the presence of large LNG vessels will make it more challenging to effectively instill a connection to this landscape and the species within it.

Perspective on Cumulative Effects

- Tsawwassen First Nation has shared that the exercise of Tsawwassen First Nation's rights has been heavily constrained by historic and existing impacts, and that many rights-based thresholds have already been surpassed and that the potential adverse effects and increased risks from TMJ will take place in a context of many existing cumulative effects from existing development; and

- Tsawwassen First Nation have shared that their important cultural practices, which are necessary for Tsawwassen First Nation's survival, cannot occur in conditions where marine traffic is already at an unacceptable level and where approximately 274 additional vessel movements per year are contemplated as part of TMJ. For example, Tsawwassen First Nation have identified that their ability to revive their traditional fishing practices, such as reef net fishing and the use of fishing weirs, is not feasible in an environment saturated with marine traffic.

E. IMPACTS ON TSAWWASSEN FIRST NATION STEWARDSHIP ASPIRATIONS

Potential Impacts and Other Concerns Raised by Tsawwassen First Nation

Tsawwassen's Declaration of Tsawwassen Nationhood and Identity emphasizes that Tsawwassen are stewards of their land, waters and resources. The ability to act as stewards over the lands, waters and resources will be directly impeded by the Project. Tsawwassen raised a variety of concerns that approval of TMJ would be fundamentally inconsistent with Tsawwassen's stewardship values in the following ways:

- Approval would add further incompatible uses to an area of Tsawwassen's territory that Tsawwassen has prioritized for restoration and cumulative effects management;
- Approval would create additional risk of collapse of Tsawwassen fishing and cultural practices without there being clear needs-based thresholds established for the Fraser River;
- Tsawwassen First Nation's ability to govern its territory in accordance with Tsawwassen law-making authority was eroded by decades of development in Tsawwassen territory, which proceeded without taking into account Tsawwassen First Nation knowledge or principles. Tsawwassen First Nation raised concern that, if the project is approved, Tsawwassen First Nation will permanently be alienated from being able to have a future where the lands being taken up by TMJ could be part of a Tsawwassen First Nation future that involves protection of those areas or management of them in a way that support rights-based activities;
- The EAO understands that Tsawwassen First Nation is leading a three-year eulachon study as part of the Coastal Environmental Baseline Program (see Section 2.1) with the support of DFO. The EAO understands that the purpose of the study is to compare relative abundance during the migration period, understand preferred spawning habitat, and movement patterns in the salt wedge to facilitate further efforts to enhance the abundance of eulachon. This work is occurring from Deas Island to Maple Ridge. Tsawwassen First Nation is concerned that approval of TMJ may restrict the range

of potential management options available to address findings of this study by facilitating further incremental impacts to eulachon; and

- The sense of pride and strength that comes from being able to uphold traditional stewardship values and be a Treaty people is an important component of Tsawwassen First Nation social and cultural health. The health of the Tsawwassen Nation is linked to their territory. Tsawwassen First Nation expressed concern that TMJ will cause members to not feel as though they are able to exercise their stewardship roles, which will impact their mental and cultural health.

Tsawwassen First Nation also noted that approval of TMJ could restrict or undermine the opportunities and commitments they see in British Columbia's DRIPA Action Plan for developing new partnerships between the provincial government and Tsawwassen First Nation relating to advancing stewardship values and managing the cumulative effects that undermine those values.

Mitigation measures through proposed conditions and KMMs

The EAO has recommended that project conditions be drafted in a way Tsawwassen First Nation would be consulted about the development of mitigation plans. The EAO recognizes that Tsawwassen First Nation has expressed that this approach does not adequately recognize Tsawwassen as a government and provides little effective way for Tsawwassen to have a meaningful stewardship role.

The EAO's Assessment of Potential TMJ Impacts to Tsawwassen Rights

The EAO acknowledges that, particularly given Tsawwassen's experience with cumulative effects, approval of TMJ without Crown or TJLP commitments to address cumulative effects on the Fraser River is inconsistent with Tsawwassen's stewardship aspirations under Treaty.

The EAO recognizes that approval of TMJ based on current proposed conditions and mitigation measures will not fully address the sense of loss from the project being approved despite being inconsistent with Tsawwassen First Nation stewardship values and that those impacts are guaranteed. Similarly, the EAO understands the sense of Tsawwassen First Nation as a Treaty Nation will be undermined if the Project is approved as it will represent a fissure in the Government-to-Government relationship that Tsawwassen First Nation sought to establish through Treaty.

The EAO understands that Tsawwassen First Nation's stewardship is tied to the territory in which the Nation has lived for thousands of years. If TMJ is approved, it will have far reaching effect on Tsawwassen First Nation's relationship with its lands and its ability to uphold stewardship values by embodying a decision-making process that is inconsistent with Tsawwassen First Nation's ability to govern their resources in accordance with their laws and traditions. Tsawwassen First Nation stewardship goes beyond simply ensuring resource sustainability; it is a relationship built on respect and gratitude for the species in the territory that exist in equilibrium with the Tsawwassen members. It is this relationship that is threatened when Tsawwassen is rendered unable to maintain the relationship in accordance with its laws and knowledge due to large projects that disrupt the equilibrium and harmony of the people, resources and the lands. Given the scale of TMJ, the extent of the effect on stewardship values will reverberate throughout the entire Territory, and will be fell by all Tsawwassen members, including those who do not live on the lands.

The impairment of Tsawwassen First Nation stewardship values will have a broad geographic effect as Tsawwassen First Nation may not simply 'go somewhere else' to escape the effects of TMJ. The impact of this is made more severe by reality that Tsawwassen lands are surrounded by industry, including the ferry and existing port that lie in the sea in front of their lands.

The EAO notes that there are limited measures that it can require of TJLP to mitigate any current conditions that impede Tsawwassen First Nation's stewardship aspirations and that this is an area where Tsawwassen First Nation views the role of the Crown as particularly important. The EAO is aware that TJLP has committed to contribute up to $2 million to the First Nations Fisheries Legacy Fund (FNFLF)[75], and that contribution could support recovery programs for chinook salmon, eulachon and sturgeon in the Fraser River and Salish Sea. The EAO acknowledges that Tsawwassen First Nation has sought further information about how the efficacy of that contribution would be measured and that Tsawwassen has noted that the contribution is not specific to impacts to Tsawwassen sense as a Treaty Nation, its stewardship values or its relationship with British Columbia as a treaty partner. For more information about the EAO's consideration of TJLP's contribution proposal with respect to non-Tsawwassen factors, refer to Section 13.1 on Current Context and Cumulative Effects.

F. IMPACT CONCLUSION SUMMARIES

The EAO finds, taking into account the mitigation measures proposed by TJLP and those proposed to be included in TMJ provincial conditions and recommended KMMs under CEAA 2012, that the Project will have the following impacts to Tsawwassen First Nation's rights and aspirations under Treaty:

1. Harvesting Fish and Aquatic Plants: Moderate-to-serious Impact of a regional and long-term nature within a preferred area that is already impacted by cumulative effects. Potential for impacts to further increase
2. Harvesting other resources (migratory birds and gathering plants): Minor Impact for harvesting migratory birds. Negligible impact for gathering plants
3. Cultural Well-being: Serious Impact of a regional and long-term nature within an area essential for Tsawwassen cultural well-being
4. Stewardship Aspirations under Treaty: Project is understood to be inconsistent with Tsawwassen's stewardship aspirations under treaty.

Alignment with Reconciliation Commitments

Tsawwassen First Nation requested that EAO provide its perspective of this EA in the context of the broader goal of reconciliation, which EAO has provided below.

> *The province is committed to implementing the UN Declaration on the Rights of Indigenous Peoples (UNDRIP) and the EAO is supporting this by bringing specific principles of UNDRIP into action in the context of EA.*

The following sections focus on describing the consultation process used by the EAO and Tsawwassen in this EA and describing the measures that the Tsawwassen First Nation has requested that the Crown adopt to minimize or accommodate residual Project effects on Tsawwassen's Treaty rights and to address the uncertainties Tsawwassen has identified during the EA.

G. TSAWWASSEN FIRST NATION'S INVOLVEMENT IN THE CONSULTATION PROCESS

With respect to the TMJ EA and EAO's engagement with Tsawwassen First Nation, the EAO and Tsawwassen have sought to engage in a manner that is consistent with the Tsawwassen Final Agreement, given that the Treaty reflects a significant step towards reconciliation, solidifying a government-to-government relationship between the three parties.

The EAO and Tsawwassen First Nation have met and exchanged materials at all stages of the EA, beginning with the pre-Application phase of TMJ (2015 to 2018) and continuing to the present. The EAO and Tsawwassen First Nation have approached consultation with a focus on discussion of issues and concerns raised by Tsawwassen First Nation in relation to TMJ's potential impacts on (i) Tsawwassen First Nation's treaty rights and (ii) valued components in general. Notwithstanding capacity constraints on Tsawwassen First Nation as a result of the many EAs occurring concurrently in Tsawwassen First Nation territory, Tsawwassen First Nation

has provided considerable submissions, technical reviews, working group comments, among other forms of input, to TJLP, IAAC and the EAO during the EA that have enriched the EAO's understanding of impacts of TMJ on Tsawwassen First Nation and informed the assessment report.

Through the course of the EA, the EAO and Tsawwassen First Nation have not always seen eye to eye on the consultation and EA processes but have endeavoured to find ways to work through challenges. In April 2020, Tsawwassen First Nation provided the EAO with a preferred methodology of assessment of impacts to Tsawwassen First Nation's rights for the TMJ assessment. Since then, the EAO and Tsawwassen First Nation worked toward a mutually agreeable approach to the assessment of impacts to rights, which has resulted in the EAO reaching conclusions in Part C that Tsawwassen First Nation supports. In the latter stages of the EA process, the EAO and Tsawwassen First Nation undertook enhanced engagement in response to Tsawwassen First Nation expressing serious concern with how the EAO was dealing with substantive Tsawwassen submissions relating to information gaps, assessment uncertainty, methodological concerns with biophysical assessments and British Columbia's role in addressing accommodation measures beyond the narrow scope of project conditions. This led to the co-development of a set of engagement principles and an increased frequency of meetings where productive, collaborative dialogue took place relating to Chapter 5, Part C, and mitigation measures.

During Application Review, the EAO, the Agency, and Tsawwassen First Nation engaged in an iterative tripartite dialogue regarding the EAO's recommended KMMs under CEAA 2012, the related federal conditions, and Tsawwassen First Nation's feedback on both. The EAO has endeavored to develop KMMs that are responsive to Tsawwassen First Nation concerns. The KMMs recommended by the EAO are an area of non-consensus between the EAO and the Tsawwassen First Nation: whereas Tsawwassen First Nation's position is that certain KMMs needed to be enhanced, the EAO believes it has recommended the best suite of KMMs possible within its authority in the EA process. Through the consultation process the EAO and Tsawwassen First Nation have had extensive discussions about whether, how and to what extent project conditions adequately mitigate impacts to Tsawwassen's Treaty Rights. While the EAO and Tsawwassen First Nation may disagree on various KMMs, the EAO and Tsawwassen First Nation agree that, even with the recommended KMMs, TMJ is likely to result in outstanding impacts to Tsawwassen First Nation and its Treaty rights, particularly relating to cumulative effects.

The EAO understands and respects that Tsawwassen First Nation continues to have outstanding concerns relating to TMJ in three substantive areas: (1) TJLP proposals and the updated recommended KMMs under CEAA 2012 fail to avoid or adequately mitigate effects on Tsawwassen Treaty rights; (2) the EA process for TMJ is nearing completion without the Crown having made commitments to accommodate unmitigated impacts; and (3) that approval of TMJ could undermine the promise and scope of the DRIPA Action plan as it relates to the Treaty. Please refer to the section directly below ("Impacts to Reconciliation") for more information about potential interaction between TMJ and the promise and scope of the DRIPA Action plan as it relates to Treaty.

H. IMPACTS TO RECONCILIATION

Throughout the EA process, the EAO and Tsawwassen First Nation kept in mind the broader imperative for tangible and meaningful progress in reconciliation. The EAO and Tsawwassen share the view that the decision-making process for the TMJ Project is an opportunity to continue to build a relationship between the governments based on mutual respect and understanding and to further support the Treaty relationship between the Province and Tsawwassen First Nation.

The EAO and Tsawwassen First Nation recognize that fostering strong relationships is an important part of advancing reconciliation. To this end, the EAO and Tsawwassen First Nation engaged during the EA of TMJ with the intent to foster and support relationship-building between the governments based on mutual respect and understanding. As noted in the previous section, the EAO sought, with guidance from Tsawwassen First Nation, to adjust its approach to engagement at various stages of the EA to reflect the Treaty relationship between the Province and Tsawwassen First Nation. The EAO believes this is reflected in its work with Tsawwassen First Nation on referral materials and its efforts to communicate Tsawwassen First Nation's accommodation proposals, among other steps, recognizing that the EAO and Tsawwassen First Nation may not have reached consensus on the adequacy of some of the proposed conditions and recommended KMMs.

Tsawwassen First Nation has reiterated its view that an iterative consultation process, while a part of reconciliation, is not the only lens for considering the implications a project decision may have for reconciliation between British Columbia and Tsawwassen First Nation. In this

regard, Tsawwassen First Nation noted that the DRIPA Action Plan[227] sets out a number of objectives and actions that are central to advancing tangible and meaningful progress on Tsawwassen-British Columbia reconciliation and explained how approval of TMJ (in the absence of improved project condition and Crown accommodation measures) would undermine various objectives and commitments in the DRIPA Action Plan that hold great promise for advancing reconciliation with Tsawwassen First Nation as a modern Treaty Nation. The EAO understands that in Tsawwassen First Nation's view, considering the importance of the TMJ project area for its Treaty rights and aspirations – and the significant existing cumulative effects in the area – approval of TMJ would be inconsistent with and undermine ways the DRIPA Action Plan could otherwise advance reconciliation with Tsawwassen First Nation.

Tsawwassen First Nation has also shared its view that an approval of TMJ is inconsistent with British Columbia and Canada's acknowledgement in Preamble K of the Treaty, related to Tsawwassen aspiration to participate more fully in the economic, political, cultural and social life of British Columbia in a way that preserves and enhances the collective identity of Tsawwassen people as Tsawwassen First Nation, and to evolve and flourish in the future as a self-sufficient and sustainable community.

Tsawwassen First Nation has also expressed that approval of projects when there are unmitigated impacts does not advance reconciliation. Tsawwassen has expressed that TMJ is presently such a case because the EAO and Tsawwassen First Nation have concluded that there are unmitigated impacts from TMJ after taking into account project conditions and recommended KMMs. Tsawwassen First Nation has identified nine "Unresolved Treaty Issues", which include (1) mitigations remaining inadequate; (2) marine shipping impacts remaining unaddressed; (3) problems with TJLP's BVS-related assumptions; (4) underestimating of TMJ's contribution to cumulative effects (i.e., accepts "scorched Earth" reasoning) in the EAO's referral materials; (5) the flawed approach to consideration of cumulative effects when Tsawwassen will disproportionally bear project impacts; (6) inadequate oversight if TMJ is approved; (7) lack of mitigations and accommodations for cultural impacts; (8) potential for the

[227] Reconciliation Transformation and Strategies Division BC Ministry of Indigenous Relations and Reconciliation. March 30, 2022. Declaration on the Rights of Indigenous Peoples Act Action Plan – 2022-2027. https://declaration.gov.bc.ca. Accessed August 23, 2022.

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approval of TMJ to undermine the Declaration on the Rights of Indigenous Peoples Act Action Plan; and (9) the outstanding need for Crown accommodation.

Tsawwassen submits that an approval that has the potential to deny Tsawwassen First Nation the reasonable opportunity to harvest Fish and that has serious impacts to Tsawwassen First Nation culture – as this project does in Tsawwassen's view – is harmful to reconciliation in addition to creating serious Treaty issues.

In Tsawwassen First Nation's view, the context of this application – where a large project is proposed to be constructed and operated in a cultural keystone area for Tsawwassen First Nation that is experiencing massive cumulative pressures and where the Crown and the Nation agree that the project will have serious, regional and irreversible impacts to the modern treaty rights of the Tsawwassen First Nation that cannot be fully mitigated with project conditions alone – means that the proponent, British Columbia and Canada must make real commitments to create mechanisms for protecting Tsawwassen's stewardship values and addressing cumulative effects in the Lower Fraser River to address the negative consequences that approval of the Project would otherwise have on the ability of British Columbia to advance reconciliation with Tsawwassen First Nation.

In May 2020, Chief Baird wrote to Ministers Heyman and Rankin seeking confirmation that British Columbia would enter accommodation negotiations as a priority matter in the consultation process. In follow-up correspondence to the EAO, Tsawwassen First Nation has requested accommodation commitments from either Crown relating to TMJ's contribution to cumulative effects or the serious impacts from TMJ on aspects of Tsawwassen First Nation's Treaty rights and interests relating to culture, stewardship, governance, or reconciliation.

With respect to requests for further commitments from either Crown, Tsawwassen First Nation presented 20 recommendations to accommodate impacts to Tsawwassen First Nation from TMJ. Tsawwassen has articulated measures that may assist with addressing TMJ impacts to Tsawwassen First Nation that are beyond the authority of the EAO, but which Tsawwassen First Nation argues the Crown must undertake should the project be approved, if TMJ is to avoid seriously harming reconciliation progress with Tsawwassen First Nation. The EAO, IAAC and Tsawwassen First Nation had several iterative discussions on the 20 recommendations, both through meetings and in writing. Of the 20 commitments sought by Tsawwassen, the two it has identified as most central to reconciliation and respect for the Treaty relationship (in addition

to improving project conditions relating to shipping beyond what is currently recommended in order to better protect Tsawwassen First Nation Fishing rights) include:

1. The Crown to develop measures with TFN relating to šxʷkʷecxənəm, in the event the Project is approved, that include:

    a. Establishing a long-term initiative to study, correct and manage cumulative impacts in the Lower Fraser;
    b. Providing long term resources to support *šxʷkʷecxənəm* and other community development goals.

2. The Crown to establish and fund a government-to-government oversight body for the Project, inclusive of TFN, to assist with regulatory oversight and compliance of the Project. This oversight body must have broad power in respect of any draft mitigation and monitoring plans not to approve inadequate plans, give further directions with respect to steps that must be taken to remedy any deficiencies, or to impose terms or conditions.

Commitments sought by Tsawwassen First Nation are still under discussion between Tsawwassen First Nation and the provincial and federal Crown but none have been confirmed at this time. The EAO acknowledges the relationship between these commitments and advancing reconciliation and will continue to work with Tsawwassen First Nation and other branches of government to seek creative solutions on these important matters, including development of measures relating to šxʷkʷecxənəm.

14.8 TSLEIL-WAUTUTH NATION

14.8.1 TSLEIL-WAUTUTH NATION AND EAO JOINT SUMMARY

The EAO and Tsleil-Waututh Nation have worked together to identify concerns with TMJ and the potential impacts to Tsleil-Waututh Nation's constitutionally protected (Section 35) rights, title and interests. The EAO and Tsleil-Waututh Nation hold different responsibilities, obligations and rights. The EAO and Tsleil-Waututh Nation acknowledge the importance of implementing the United Nations Declaration on the Rights of Indigenous Peoples in all EA processes.

Tsleil-Waututh Nation are the People of the Inlet and have lived in and along the Inlet since time out of mind. It is Tsleil-Waututh People's obligation and birthright to care for the land and

water. In every decision regarding Tsleil-Waututh Nation Territory, Tsleil-Waututh works to put the Tsleil-Waututh "face" back on the Territory, to steward the lands, resources and important use areas, and to rebuild the health of the Territory. Under the UN Declaration and the Declaration on the Rights of Indigenous Peoples Act (DRIPA) Tsleil-Waututh Nation has:

- the right to self-determination (Article 3);
- the right to self-government (Article 4);
- the right to maintain and strengthen their distinct political and legal institutions (Article 5);
- the right to not be subjected to destruction of their culture (Article 8);
- the right to maintain and protect their culture, cultural sites, cultural heritage, traditional knowledge and traditional cultural expressions (Article 11, 12, 31);
- the right to participate in decision-making in matters which would affect their rights (Article 18);
- the right to maintain their health practices including the conservation of vital medicinal plants, animals and minerals (Article 24);
- the right to maintain and strengthen their distinctive spiritual relationship with their traditional territory (Article 25);
- the right to the lands, territories and resources which Tsleil-Waututh Nation has traditionally owned, occupied or otherwise used or acquired (Article 26);
- the right to the conservation and protection of the environment and the productive capacity of their lands or territories and resources (Article 29);
- the right to determine and develop priorities and strategies for the development or use of their Territory (Article 32); and
- the right to just and fair procedures for the resolution of conflict and disputes with the EAO, as well as to effective remedies for all infringements of their individual and collective rights (Article 40).

The EAO is a neutral regulatory agency within the provincial government of B.C. which follows a defined process, as established in the *Environmental Assessment Act*, 2018 and associated regulations and policies, to conduct the assessment of major projects proposed in B.C. Under the *Environmental Assessment Act*, 2018, one of the purposes of the EAO is to apply the UN Declaration. For TMJ, the EA is being conducted under the *Environmental Assessment Act*, 2002 (The Act), and CEAA 2012. Under DRIPA, the B.C. government committed to implement the UN

Declaration in consultation and cooperation with Indigenous peoples in British Columbia. This commitment includes the responsibility to:

- consult and cooperate in good faith with Tsleil-Waututh Nation in order to obtain their free, prior and informed consent before adopting and implementing legislative or administrative measure that may affect them (Article 19);
- give protection to Tsleil-Waututh Nation's traditional lands, territories and resources (Article 26);
- establish and implement, in conjunction with Tsleil-Waututh Nation, a fair, independent, impartial, open and transparent process, giving due recognition to Tsleil-Waututh Nation laws, traditions and customs, to recognize the rights of Tsleil-Waututh Nation pertaining to their lands, territories and resources (Article 27);
- take effective measures to recognize and protect the exercise of Tsleil-Waututh Nation's right to maintain, control, protect and develop their cultural heritage, traditional knowledge and traditional cultural expressions, in conjunction with Tsleil-Waututh Nation (Article 31);
- consult and cooperate in good faith with Tsleil-Waututh Nation in order to obtain their free and informed consent prior to the approval of any project affecting their lands or territories and other resources, particularly in connection with the development, utilization or exploitation of water or other resources (Article 32);
- take appropriate measures to mitigate adverse environmental, economic, social, cultural or spiritual impact (Article 32); and
- take the appropriate measures to achieve the ends of the UN Declaration (Article 38).

Due to the EAO and Tsleil-Waututh Nation's different responsibilities, obligations and perspectives, Tsleil-Waututh Nation requested to represent their own impacts on rights in Part C. The EAO would like to thank Tsleil-Waututh Nation for sharing their traditional knowledge and the EAO respectfully acknowledges that Tsleil-Waututh Nation's assessment included in Part C of this Report (in italics below) was provided in their own words to express Tsleil-Waututh Nation's concerns regarding the potential project effects and cumulative effects to their Aboriginal Interests. The assessment presented below provides a better understanding, directly from Tsleil-Waututh Nation of their assessment methods (Section 14.8.2), perspectives related to consultation and the EA process (Section 14.8.3), community profile (Section 14.8.4), cultural health (Section 14.8.5), and potential impacts to Tsleil-Waututh Nation's cultural health and right to practice culture (Section 14.8.6), impacts to Tsleil-Waututh Nation fisheries and right to fish (Section 14.8.7), hunting, trapping and gathering rights (Section 14.8.8), and self-governance, food sovereignty and stewardship responsibilities (Section 14.8.9).

The EAO greatly appreciates the collaborative and positive relationship in working with Tsleil-Waututh Nation throughout the EA, and the continued relationship building between the EAO, the Agency and Tsleil-Waututh Nation. The EAO is of the view that it has approached consultation with Tsleil-Waututh Nation with the intent of substantially understanding and addressing potential TMJ-related effects identified by Tsleil-Waututh Nation. At the onset of consultation to support Application Review, the EAO and Tsleil-Waututh Nation have been jointly drafting shared principles to guide engagement on TMJ:

- Government-to-Government Relationship;
- Mutual Accountability;
- Transparency; and
- Working Together to Create a Path Forward.

The EAO and Tsleil-Waututh Nation endeavoured to work cooperatively to find mutually agreeable solutions and timelines. In addition to bi-weekly teleconferences, the EAO also organized several technical meetings with Tsleil-Waututh Nation and provincial and federal regulators to address questions and concerns related to accidents and malfunctions, air quality and GHG emissions, and SRKW. The EAO and Tsleil-Waututh Nation also met to work collaboratively and iteratively on draft provincial conditions and recommended KMM's under CEAA 2012. Potential effects to cultural heritage and intangible cultural heritage were also discussed during the EA, and the EAO recommended a Cultural Heritage KMM under CEAA 2012. However, TWN has expressed that this measure does not address potential effects on intangible cultural heritage and the effects on the health and wellbeing of TWN associated with SRKW.

Tsleil-Waututh Nation has drafted this Part C chapter using their own methods. While the EAO has an obligation to reflect the Crown's conclusions in this chapter, the EAO considered information from Tsleil-Waututh Nation's Part C, as well as information gathered during consultation, and during the review of the Application in forming its conclusions using EAO's methods.

The EAO and Tsleil-Waututh Nation have worked together to identify concerns with TMJ, including in the broader context of cumulative effects. While the EAO and Tsleil-Waututh Nation may not have reached consensus on some items, there was meaningful dialogue to seek understanding, clarity, and perspective of the various points of view. The EAO and Tsleil-Waututh Nation worked together to structure this section to reflect the consensus-seeking approach and values identified by Tsleil-Waututh Nation and co-drafted the conclusions. EAO views the meaningful effort to seek consensus as supporting the broader goal of reconciliation.

Tsleil-Waututh Nation's Part C chapter is presented (in italics), followed by the EAO's Crown conclusions. Where consensus on conclusions was not reached, the parties endeavoured to reach consensus on the level of engagement. Part C presents both Tsleil-Waututh Nation's and the EAO's analyses and conclusions for provincial and federal decision maker's consideration. The EAO understands that Tsleil-Waututh Nation may disagree with the EAO's conclusions and that Tsleil-Waututh Nation is of the view that their Part C assessment and conclusion are the appropriate conclusions for provincial and federal decision makers to consider for understanding the potential impacts on Tsleil-Waututh's Aboriginal Interests, including Tsleil-Waututh Nation's cultural health and practices and fisheries interests within Tsleil-Waututh Nation's traditional territory. As such, this chapter presents both analyses for consideration by decision makers.

14.8.2 TSLEIL-WAUTUTH NATION METHODS

The assessment of impacts to Tsleil-Waututh Nation's Aboriginal rights includes consideration of pathways of effects from the proposed TMJ on sufficiency of resources, access and experience, as well as culture, governance, knowledge and other components which may be "intangible" for this purpose. Assessing the potential impacts of TMJ to Tsleil-Waututh Nation's Aboriginal interests requires careful consideration of the expected effects of the construction and maintenance of the project on Tsleil-Waututh Nation's asserted Aboriginal right to fish and hunt, and to maintain and practice their traditional culture. Such an assessment of the potential effects of TMJ on these Aboriginal rights must be considered within the current constraints under which Tsleil-Waututh Nation presently exercises those rights, and the context of the cumulative effects that have already greatly curtailed Tsleil-Waututh Nation's ability to harvest important traditional food species, and restricted aspects of participation in and preservation of their traditional Coast Salish culture.

Tsleil-Waututh Nation's Aboriginal interests in the Project study area were identified by Tsleil-Waututh Nation's assertion of their Aboriginal right to fish and the right to hunt, and the evidence supporting such an assertion[228,229]. Tsleil-Waututh Nation's right to fish sockeye and

[228] *Morin, Jesse (2015) Tsleil-Waututh Nation's History, Culture and Aboriginal Interests in Eastern Burrard Inlet. Prepared for Gowlings, Lafleur, Henderson LLP. Submitted to the National Energy Board.*

[229] *Morin, Jesse (2016) Tsleil-Waututh Nation Traditional Use Study Review in Relation to the WesPac Tilbury Marine Jetty Project (14-211). Report prepared for Tsleil-Waututh, Treaty, Lands and Resources Department. Tsleil-Waututh Nation.*

chinook salmon and crab in the vicinity of the project area is especially salient. Tsleil-Waututh Nation's desire to fish sturgeon and eulachon is also notable.

In addition to these Aboriginal rights to fish and hunt, Tsleil-Waututh Nation also holds the Aboriginal right to practice and preserve their traditional culture, the right to gain economic benefit from the lands and resources of their territory, and the right to self-governance and self-determination (UNDRIP Articles 3, 4, 5, 8, 11). With relevance to TMJ, this includes cultural relationships with killer whales, preservation of archaeological materials, food sovereignty as well as gaining economic benefit from the project location.

The TMJ project assessment, which includes TJLP's Application[230], bunker vessel scenario assessment[231], and the additional marine shipping assessment[232] identifies many potential effects on the local ecology, human health, and economy within the study area associated with both construction and operation of TMJ. The numerous potential impacts to fish habitat and migratory behaviour identified in the assessment are clearly relevant to Tsleil-Waututh Nation's right to fish. In addition to these potential effects identified within the project assessment, many other potential effects with relevance to Tsleil-Waututh Nation Aboriginal rights were also identified. These include effects associated with marine shipping and ecosystems related effects not considered in the TMJ project assessment. Tsleil-Waututh Nation has also identified potential concerns about marine shipping through both the cultural and ecological study areas impacting stellar sea lions, humpback whales, forage fish, salmon, SRKW, culturally significant places, and more broadly, about GHGs and climate change, and climate-change driven ecological changes. Studies have shown that climate change–induced reduction of everyday beach use and associated damage to archaeological sites weakens Tsleil-Waututh Nation's community health as it disrupts Tsleil-Waututh Nation's members' connections to their ancestors, a foundation/cornerstone of their cultural responsibility[233]. Food security and food sovereignty in coastal First Nation's Traditional food systems are already under pressure from

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[230] *WesPac (2019) WesPac Tilbury Marine Jetty Project: Environmental Assessment Certificate Application. Submitted to BC Environmental Assessment Office by WesPac Midstream – Vancouver LLC.*

[231] *TJLP (2022). Tilbury Marine Jetty: Bunker Vessel Scenario Assessment. Submitted to the BC Environmental Assessment Office by Tilbury Marine Jetty Limited Partnership.*

[232] *WesPac (2020) WesPac Tilbury Marine Jetty Project: Marine Shipping Assessment. Submitted to BC Environmental Assessment Office by WesPac Midstream-Vancouver LLC.*

[233] *Donatuto, Jamie, Eric Grossman, John Konovsky, Sarah Grossman & Larry Campbell (2014) Indigenous Community Health and Climate Change: Integrating Biophysical and Social Science Indicators, Coastal Management, 42:4, pp. 355-373.*

various stressors, including climate change, and may be further impacted by the ongoing development of the area and associated marine shipping.

The specific context of Tsleil-Waututh Nation's efforts to exercise their Aboriginal rights in an urbanized and industrialized landscape was also considered in determining the seriousness of impacts to these Aboriginal rights. Many of the preferred fish species that Tsleil-Waututh Nation formerly harvested in the project area are endangered (e.g., eulachon, white sturgeon) or severely depleted (e.g., chinook), and much of the Lower Fraser River is already heavily modified and industrialized. It is important to note that the Lower Fraser River area is Tsleil-Waututh Nation's only source of sockeye, and one of only two other locations for harvesting other salmon species.

Given the overlap of the project area within Tsleil-Waututh Nation's fishery area, the potential negative impacts to salmonids and other fish in the project area, the potential impact to the Tsleil-Waututh Nation fish harvest in the area, the impact to SRKW, impacts to Tsleil-Waututh Nation's ability to practice their culture and the cumulative effects of more than a century of development in the area, several specific project related activities are anticipated to negatively impact Tsleil-Waututh Nation's Aboriginal right to fish, right to practice and preserve their traditional culture and right to self-governance.

There are many mitigations to compensate for or ameliorate these various effects within the TMJ assessment, and many more possible mitigations are identified (see Appendix 7: Tsleil-Waututh Nation's Part C Table of Effects). Because the efficacy of any future mitigation is uncertain[234], potential impacts to Tsleil-Waututh's rights were considered in light of a range from fully effective mitigations ("high efficacy") to partially successful or unsuccessful mitigations ("low efficacy").

It is worth noting that Tsleil-Waututh Nation has actively engaged with TJLP, Federal Agencies and provincial and federal regulators in the development of the Draft Referrals Material and has thoroughly reviewed the mitigation measures and plans proposed and described in the draft Provincial and Federal Conditions, which were originally provided by the Agency and the EAO. For each impact and corresponding proposed mitigation, the probability of that mitigation achieving high to low efficacy was assessed based on Tsleil-Waututh Nation's experience with similar mitigation measures. An associated probability was estimated for the proposed

[234] *It has been Tsleil-Waututh Nation's experience that proposed mitigation measures have been variably successful -- some mitigation measures have offset effects while others have been largely unsuccessful. From Tsleil-Waututh Nation's perspective, there is no guarantee of high efficacy of proposed mitigation measure, and the effectiveness of such measures needs to be tracked and quantified after implementation.*

mitigations being entirely effective in offsetting the identified impacts, and for the proposed mitigations being ineffective in offsetting the identified impacts. These associated probability values were estimated based on Tsleil-Waututh Nation's extensive experience with proposed mitigations for projects such as TMJ.

Thus, the residual effect (or RE) was calculated by adding the project impact (PI) to the product of the mitigation (M) and the probability of efficacy (PE), or:

$$RE = PI+M*PE$$

If the proposed mitigations for Project related activities have, in Tsleil-Waututh Nation's view, a low or moderate probability of being entirely effective, then that residual effect is anticipated to impact Tsleil-Waututh Nation's rights.

The severity of the residual effects (SRE) of the potential impacts to Tsleil-Waututh's rights and other Aboriginal interests were considered in terms of:

- *the duration of the impact (DI);*
- *the reversibility of the impact (RI); and*
- *the cumulative impacts to that resource or activity since First Contact (AD 1792) (CI).*

Thus:

$$SRE = D*RI*CI$$

The calculation detailed above describes how the qualitative attributes of the project were considered in assessing a residual effect and assessing the severity of the residual effect. This approach is used in assessing the severity of Project-related residual effects on Tsleil-Waututh Nation's Aboriginal interests as identified below.

In addition to determining the severity of a residual effect or the intensity of a specific impact (low to extreme), Tsleil-Waututh Nation knowledge and judgment was used to assess a residual effect seriousness due to its significance to Tsleil-Waututh Nation values. The seriousness criterion of potential impacts or cumulative impacts on the community and their rights, is based on the effects outcome, and serves as a guide for defining the risks associated to those impacts. That is, the seriousness and irremediability (any limits to mitigate or restore) of those impacts. For example, if a cultural event or ceremony can only be practiced in specific areas at a given time and a project would impede the ability to carry out the right, people's health and wellbeing could be negatively affected. By limiting their spiritual connection to their landscape, the impact on the right may pose a serious impact to the integrity of Tsleil-Waututh Nation laws and practices, and therefore is considered to be more serious.

The above methodology is a first step in viewing impacts to Tsleil-Waututh Nation's Rights in a holistic manner and trying to address Tsleil-Waututh Nation's ongoing concerns with the efficacy of mitigations and the cumulative impacts of Projects since First Contact (AD 1792). The impacts described below highlight the significant concerns Tsleil-Waututh Nation has with TMJ. However, the impacts below are not finite and do not describe all potential TMJ-related impacts to Tsleil-Waututh Nation's rights, title and interests.

14.8.3 TSLEIL-WAUTUTH NATION CONSULTATION PROCESS

This section broadly describes the TMJ-related consultation and engagement process between Tsleil-Waututh Nation and the EAO and where relevant, between Tsleil-Waututh Nation and TJLP. As a basis for meaningful Consultation, Tsleil-Waututh Nation's Stewardship Policy (2009) outlines who Tsleil-Waututh people are, describes our legal principles and community objectives, and asserts our principles and standards for effective engagement, including Consultation and Accommodation. For this purpose, we have applied this Policy and its provisions as an overarching framework and analysis from what Tsleil-Waututh Nation defines as "meaningful consultation".

A. PROVISION OF NOTICE AND RESOURCING BY THE RESPONSIBLE AGENCY TO THE TSLEIL-WAUTUTH NATION TO PARTICIPATE EFFECTIVELY IN THE CONSULTATION PROCESS

In July of 2015, the EAO included an initial assessment of potential impacts of the Project to Tsleil-Waututh Nation's Aboriginal rights and title. However, based on limited research and the inadequate assessment of the scope of Tsleil-Waututh Nation's Aboriginal rights and interests to the Fraser River and project location, Tsleil-Waututh Nation was wrongly placed in Schedule C of Section 11. Tsleil-Waututh Nation strongly contested this determination and could not adequately comment on the draft Section 11 Order. Participation in the TMJ EA was only considered after the EAO placed Tsleil-Waututh Nation on Schedule B of Section 11 in September 2015, and as such, was only then notified about EA regulatory milestones for TMJ, missing opportunities and notices and the opportunity to provide information in crucial stages of the process. For instance, Tsleil-Waututh Nation could not meaningfully engage during the pre-application phase for the selection of relevant VCs and discussions on the draft AIR.

Tsleil-Waututh Nation was supported throughout the remaining EA process with notice of Project changes through regular contact with the EAO, the Agency and through the Working Group.

B. PROVISION OF INFORMATION IN SUFFICIENT FORM AND DETAIL TO ENABLE TSLEIL-WAUTUTH NATION IN DECISION MAKING AND TO PREPARE AND PRESENT THEIR VIEWS

ON IMPACTS OF THE PROJECT

Methodological concerns: Baseline data, existing conditions and cumulative effects

Tsleil-Waututh Nation has raised a number of methodological concerns regarding the baseline data used to measure existing conditions around TMJ and assessing the cumulative impacts that are likely to result from TMJ in combination with other development projects. Tsleil-Waututh Nation acknowledges that the EAO uses methods outlined in the EAO's Guideline for the Selection of Value Components and Assessment of Potential Effects[235], and the Agency uses methods outlined in the Agency's Technical Guidance for Assessing the Current Use of Lands and Resources for Traditional Purposes under CEAA 2012[236]. Tsleil-Waututh Nation has stated that the characterization of existing conditions in the LAA and RAA is integral to developing a baseline case to which potential TMJ-related change can be compared, and is of the view that a baseline case is characterized by pre-contact conditions or at minimum, prior to intense industrialization. Baseline data for this assessment was characterized as existing conditions, resulting in a flawed assessment. The MSA in particular relied heavily on other projects, mostly RBT2 and TMX to understand baseline conditions versus gaining information as provided by Indigenous Groups.

Tsleil-Waututh Nation has a number of concerns regarding the exclusion of VCs and subcomponents for the TMJ assessment and the lack of a holistic and cumulative approach to reviewing these components. Tsleil-Waututh Nation mandates (based on our Stewardship Policy) that a cumulative effects assessment must be conducted for all effects, not just for residual effects. Simply conducting a cumulative effects assessment on residual effects is not representative of the impact nor the infringement of the Project on Tsleil-Waututh Nation 's rights, title, and interests.

Further building on the lack of baseline data and the concerns around utilizing existing conditions, the assessments of Current Use, for example, are generally based on practices that are happening presently and assess impacts only to those, without including future case scenarios of what rights could be re-established and practiced in the future; this causes an even larger gap in the information provided and needed for Tsleil-Waututh Nation decision making and meaningful consultation. Assessments do not consider socio-economic, environmental, regulatory or cultural impacts that have occurred to prevent rights from being practiced now.

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[235] https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/environmental-assessments/guidance-documents/eao-guidance-selection-of-valued-components.pdf

[236] https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/technical-guidance-assessing-current-use-lands-resources-traditional-purposes-under-ceaa-2012.html

Past impacts include contamination, depletion of key species, and policies that restrict access and exercise of rights.

Most VCs in the original Application area and the MSA were determined to be "Non-Significant" and were ranked with Negligible TMJ-related residual effects precisely because the assessment criteria rely on "mitigation measures" that are not necessarily proven to reduce adverse effects. Under paragraph 16(1)(a) of CEAA 2012, every environmental assessment must consider "the environmental effects of the project, including the environmental effects of malfunctions or accidents that may occur in connection with the project and any cumulative environmental effects that are likely to result from the project in combination with other projects or activities that have been or will be carried out" i.e. TMX, Delta Grinding Facility and RBT2. In addition, section 16.2 of CEAA recognizes the value of regional studies as a means of identifying possible future projects that may occur within a region and that may contribute to cumulative environmental effects.

As noted in the EAO's Assessment Report, the EAO did not conduct a comprehensive regional cumulative effects assessment on all the various existing constraints and pathways of impact for Current Use or Cultural Heritage for the TMJ EA. While the EAO considered that existing constraints and cumulative effects in the lower Fraser River and in the shipping lanes in the Salish Sea may increase the overall seriousness of impact of TMJ on Aboriginal Interests and Treaty rights, they underestimate TMJ's contribution to these overall cumulative effects as being minimal. Tsleil-Waututh Nation views this as a flaw in the assessment methodology and an underassessment of TMJ-related impacts and TMJ's contribution to cumulative effects.

Specific concerns regarding the assessment of Health and its implications for Tsleil-Waututh Nation Community well-being

Tsleil-Waututh Nation has also reiterated the health assessment criteria as insufficient to address how TMJ may impact Aboriginal Cultural Health. The human health assessment is based on biophysical aspects and relevant Information Requests did not provide any information to understand TMJ's implication on Tsleil-Waututh Nation's Cultural Health and its implications for the community well-being.

The current limitations of EA methodology cause Tsleil-Waututh Nation to be uninformed in relation to assessing infringement on rights, and any effects to the environment and Tsleil-Waututh Nation culture; this methodology does not allow Tsleil-Waututh Nation to make informed decisions.

Specific concerns regarding the MSA and the lack of spatial and temporal scope

Tsleil-Waututh Nation expressed their concerns regarding the revised scope of assessment for the MSA in a letter written to the Minister of Environment and Climate Change (Minister

McKenna) on August 30, 2019 and in a meeting with the Agency in September 2019. These concerns include the geographic scope of the MSA from Sand Heads to the 12 nm limit. Tsleil-Waututh Nation has continuously reached out to the Minister of Environment and Climate Change outlining the inadequacy of the marine shipping scoping decision for TMJ and requesting the Minister to revise the decision to not include TMJ-related marine shipping within Canada's Exclusive Economic Zone (200 nautical mile limit).

In a meeting with the Agency, representatives explained that staff at the table were unable to discuss legal matters regarding jurisdiction (one of Tsleil-Waututh Nation's arguments for a 200 nautical mile limit scope) and the Agency stated that they were unable to comment on the Minister's reply to the August 2019 letter.

With no response from the Minister, Tsleil-Waututh Nation wrote a letter to the newly appointed Minister of Environment and Climate Change (Minister Wilkinson) re-iterating our scoping concerns on December 17, 2019. Receiving no response yet again, Tsleil-Waututh Nation sent a third letter in January 2020. On March 10, 2020, almost 7 months after our original letter, Minister Wilkinson provided a response that did not address any of our concerns and encouraged Tsleil-Waututh Nation to continue dialogue with the EAO. The letter provided by the Minister did not provide sufficient information or reasoning to dismiss our request of an extension of Project scope, and thus, did not result in meaningful dialogue with Tsleil-Waututh Nation.

The MSA also originally lacked Tsleil-Waututh Nation input on Indigenous knowledge. During the review of the Information Request for the MSA, TJLP committed to reviewing transcripts from the RBT2 Panel Hearings. TJLP did not complete a full transcript review from the RBT2 hearings and did not offer Tsleil-Waututh Nation an opportunity to complete a TUS of the marine shipping area resulting in no Tsleil-Waututh Nation TMJ-specific information being included in the MSA. In March 2020, TJLP agreed to support the completion of a TUS specifically for the marine shipping area and this was completed by Tsleil-Waututh Nation in August 2020. Tsleil-Waututh Nation continues to view some of our concerns to be inadequately addressed in the EA and in the Referrals Materials.

C. PROVISION OF A REASONABLE PERIOD OF TIME IN WHICH TSLEIL-WAUTUTH NATION MAY PREPARE AND PRESENT THEIR VIEWS OF THE POSSIBLE IMPACT OF TMJ AND GET RESPONSES FROM TJLP AND REGULATORS TO ADDRESS TSLEIL-WAUTUTH NATION CONCERNS AND VIEWS AND IDENTIFY AREAS OF DISAGREEMENT

Tsleil-Waututh Nation actively participated in the consultation activities and opportunities provided by both the EAO and TJLP. However, Tsleil-Waututh Nation raised concerns with the timelines imposed on them throughout the EA process.

Tsleil-Waututh Nation worked with the EAO to address the MSA information request once the scope of assessment for TMJ was revised to include a marine shipping component. Both during a meeting with the EAO on October 31, 2019 and in an email to the EAO on November 14, 2019, Tsleil-Waututh Nation expressed concerns with the number of outstanding issues with the MSA information request. Tsleil-Waututh Nation requested that the information request not be issued until Tsleil-Waututh Nation had received adequate responses from TJLP and until TJLP, the EAO and Tsleil-Waututh Nation had reached mutually satisfactory solutions to the concerns. The EAO ignored Tsleil-Waututh Nation's request and issued the MSA information request on November 15, 2019.

In a letter sent in February 2020 to the Associate Deputy Minister, Kevin Jardine, Tsleil-Waututh Nation expressed concerns about the MSA workplan. The workplan provided did not give Tsleil-Waututh Nation sufficient time for dialogue and resolution seeking for Tsleil-Waututh Nation's significant outstanding concerns with TMJ's Environmental Assessment Original Application and MSA. The rushed timelines did not constitute meaningful Consultation as described in Tsleil-Waututh Nation's Stewardship Policy (2009).

At the start of the COVID-19 pandemic, Tsleil-Waututh Nation raised concerns to both TJLP and the EAO regarding current notices to continue with business-as-usual during the COVID-19 pandemic, causing additional burdens on the Tsleil-Waututh Nation government and community as a whole. Indigenous groups have been deeply impacted by the COVID-19 pandemic and the news of unmarked graves at former residential school sites. However, the province continues with business-as-usual practices with Indigenous Nations. The Province has issued interim guidelines on consultation activities during the ongoing COVID-19 pandemic but these guidelines were developed without engagement from Indigenous governance. The business-as usual approach continues to negatively impact Indigenous Nations while supporting industry with deferrals and exemptions. The approach to Consultation during the pandemic contravenes the spirit and intent of commitments from the Crown, including UNDRIP, 10 Draft Principles and TRC Calls to Action.

While the entire EA process has been burdensome to Tsleil-Waututh Nation, Tsleil-Waututh Nation appreciates the EAO and the Agency's efforts in addressing our concerns. During the last year of this assessment, the EAO and the Agency have been responsive to our concerns with regard to TMJ impacts and timelines. However, we continue to emphasize that adequate time based on Tsleil-Waututh Nation's priorities is needed to ensure meaningful consultation takes place during the current global pandemic while allowing Tsleil-Waututh Nation to put the community's needs first.

D. PROVISION FOR FULL AND FAIR CONSIDERATION OF THE INFORMATION PROVIDED BY TSLEIL-WAUTUTH NATION INCLUDING AN ISSUE RESOLUTION PROCESS IN RESPONSE TO ANY OUTSTANDING ISSUES AND THE OPPORTUNITY TO ADDRESS ANY OUTSTANDING ISSUES PRIOR TO A FINAL DECISION BY THE STATUTORY DECISION MAKER

As indicated through continuous correspondence and conversations with the EAO, Tsleil-Waututh Nation has significant outstanding concerns with the TMJ MSA Information Request, the MSA, the EA original Application area, the connection between TMJ and the FortisBC Tilbury LNG Phase 2 Expansion Project, and the inadequate assessment of impacts on Cultural Values. These can be summarized as follows:

Environmental Assessment Certificate Original Application Area

Tsleil-Waututh Nation still has outstanding comments and concerns from TMJ's original Application area. These concerns include, but are not limited to, the inadequacy of the Upstream Greenhouse Gas Assessment. Tsleil-Waututh Nation has continuously expressed these concerns with the EAO, TJLP and regulators, specifically ECCC, and believe these issues require adequate time to be addressed prior to the finalization of the EAO's referral materials including the TOC. Tsleil-Waututh Nation has also raised outstanding concerns regarding the segregation of the MSA from the original EAC Application and the resulting undercalculation of cumulative effects. We require adequate time to address these outstanding concerns with the EAO and the Agency. Tsleil-Waututh Nation, the EAO, the Agency and TJLP have had multiple online meetings to begin to address our outstanding concerns.

Marine Shipping Assessment

Tsleil-Waututh Nation has expressed significant concerns regarding the MSA. Since the beginning of the EA process, Tsleil-Waututh Nation raised concerns regarding the scope of TMJ and the necessity to include a MSA into the Salish Sea. Tsleil-Waututh Nation supported the extension of scope to include a MSA in 2019, however, Tsleil-Waututh Nation continues to have significant concerns with the scope being extended to the 12 nm limit instead of the 200 nm limit as described above. On January 27, 2020, Tsleil-Waututh Nation provided to the EAO over 90 comments and questions regarding the MSA. Our significant concerns include, but are not limited to the following:

- *Originally, Tsleil-Waututh Nation was not provided with an opportunity to conduct a TUS Summary or a Knowledge Study for the MSA. As a result, there was a lack of accurate Indigenous Knowledge, specifically Tsleil-Waututh Nation Knowledge, in the MSA as TJLP relied heavily on available information that was not project specific. The Fish and Fish Habitat Chapter for the TMJ MSA says "TU/TEK sources at the time of writing provided limited specific TU/TEK information on fish and fish habitat including information on harvest location and abundances of anadromous and other fish of interest in the LSA" (3.2.4.1.1.). It is Tsleil-Waututh Nation's*

expectation that should necessary information be missing for an EA, that the proponent conducts the necessary research and information gathering to ensure an accurate assessment. Simply concluding that information was not available at the time of writing does not constitute meaningful Consultation. Tsleil-Waututh Nation requested adequate time to complete an extension to our TUS Summary for the MSAA. In March 2020, TJLP agreed to support the completion of a TUS specifically for the marine shipping area and this was completed by Tsleil-Waututh Nation in August 2020. TJLP subsequently responded with a technical memorandum. However, after reviewing this memo, Tsleil-Waututh Nation did not agree with the rationale provided for the assessment of effects of marine shipping activities. TJLP did not take into consideration the cumulative destruction of Tsleil-Waututh Nation traditional territory, and understated interactions and overlaps with the Cultural Study Area. The analysis by TJLP of Tsleil-Waututh Nation's supplemental TUS were that all effects on Tsleil-Waututh Nation's marine resources (including FSC fisheries, and Southern Resident Killer Whales) and cultural sites (including Sacred Tunnels) would be negligible after mitigation measures are implemented. This determination is based on subjective assumptions (i.e. minor changes, no perceptible changes, no detectable changes), resulting overall in no changes to the effects conclusions from what was assessed in the EAC application or the MSA. TJLP has minimized interactions and overlaps with the Cultural Study Area arguing "occasional transit of vessels, infrequent, intermittent, with short interacting periods of time, or small increase of vessel traffic (only adds an average of 3 vessels per week)". Tsleil-Waututh Nation expressed their concern with the EAO arguing their concerns including acknowledgement of serious cumulative impacts were not adequately incorporated in the assessment. There will be significant TMJ-related impacts on Tsleil-Waututh Nation intangible cultural heritage and their continued ability to exercise their rights and that this should be accurately reflected in the conclusions.

- *Tsleil-Waututh Nation expressed concerns with the increase in cargo and tanker traffic in the Salish Sea. Tsleil-Waututh Nation does not agree with any increase in tanker and cargo traffic in the Salish Sea until appropriate thresholds have been determined for the recovery and survival of SRKW. These thresholds and management objectives to promote the survival and recovery of SRKW are required for evidence-based, scientific decisions under the Act and CEAA 2012. Once thresholds and appropriate management objectives have been established, TMJ-related effects on SRKW must be assessed in relation to those thresholds and management objectives. Adequate and effective adaptive management strategies and mitigation measures cannot be determined until TMJ-related effects in relation to thresholds have been determined. To prevent continued impacts to SRKW and infringement on Tsleil-Waututh Nation rights, the Crown should not consider permitting additional developments and SRKW habitat degradation until there is a good understanding of how to ensure the recovery and survival of SRKW; and*
- *Tsleil-Waututh Nation has expressed their concerns with the TJLP's heavy reliance on the RBT2 Project Assessment and the TMX Project Assessment. Relying almost exclusively on these assessments does not create a TMJ-specific assessment. Tsleil-Waututh Nation expects TJLP to take the necessary amount of time to conduct research and gather information to ensure that a*

Project Assessment is Project-specific. Tsleil-Waututh Nation continues to diligently assess and communicate Project impacts and we therefore expect appropriate, Project-specific mitigations responsive to our Nation's specific and focused concerns. Tsleil-Waututh Nation has requested that TJLP and the EAO work with Tsleil-Waututh Nation to develop appropriate mitigations to the impacts and concerns identified. Only once the consultation process has sufficiently identified impacts and mitigations will we be in a position to identify accommodations. Ultimately, TJLP must create commitments that are TMJ-specific and do not rely on the recommendations and accommodations from other projects.

Tilbury Marine Jetty and the FortisBC Tilbury Phase 2 Expansion Project

Throughout the EA review for TMJ, Tsleil-Waututh Nation has continuously raised concerns around the potential link between TMJ and increased LNG production. TJLP has maintained throughout the process that TMJ would occur irrespective of an expansion at the Fortis BC site. The Project Description (2015) states "[The Proponent] will not have care or control over the Tilbury LNG Plant, nor any ability to direct or influence the carrying out of that activity; nor will the Tilbury LNG Plant be expanded for WesPac's exclusive benefit"[237]. In the Upstream GHG Assessment Chapter, TJLP asserts that "the Project does not represent a new source of demand for upstream production. Rather it represents an alteration of transportation method for existing liquified natural gas production that will alter GHG emissions"[238]. Should this statement be incorrect, TJLP's Upstream GHG Emissions Assessment must be recalculated, including the 'No Project Case' as per ECCC's guidelines for Upstream Greenhouse Gas Assessments. Furthermore, in responses to Tsleil-Waututh Nation's questions and comments throughout the EA process, TJLP has stated that "the proposed development and operation of the Tilbury Marine Jetty Project is not contingent [on] any potential changes in the rate of production of LNG".

In July 2019, Tsleil-Waututh Nation was informed of the proposed FortisBC Tilbury LNG Phase 2 Expansion Project which will produce 3.5 million tonnes per annum of LNG and have 4 petajoules of LNG storage. In November 2019, Tsleil-Waututh Nation met with FortisBC to discuss the proposed LNG Expansion Project. At this meeting, Tsleil-Waututh Nation raised concerns around the dependence of TMJ on the FortisBC Tilbury Expansion Project. FortisBC clearly explained that the "existing [FortisBC] facilities would be sufficient to support the LNG

[237] *WesPac (2015) WesPac Tilbury Marine Jetty Project Tilbury Island, Delta, BC: Project Description, Section 1.1. Presented under the Canadian Environmental Assessment Act, and the British Columbia Environmental Assessment Act.*

[238] *WesPac (2019) WesPac Tilbury Marine Jetty Project: Environmental Assessment Certificate Application, Section 4.4.3. Submitted to BC Environmental Assessment Office by WesPac Midstream – Vancouver LLC.*

bunkering jetty but the export jetty would rely on LNG production from the Phase 2 [FortisBC] LNG expansion"[239]. The FortisBC Initial Project Description provides clear references to TMJ stating that "the [FortisBC Tilbury Expansion] Project will receive natural gas at the site…and will connect to existing LNG facilities…as well as the proposed…Tilbury Marine Jetty Project"[240].

Tsleil-Waututh Nation is very concerned with the clear contradiction between the information we were provided throughout the TMJ EA and the information received from FortisBC regarding the proposed Tilbury Phase 2 LNG Expansion Project. FortisBC's clear indication that TMJ is dependent on LNG production from the FortisBC Phase 2 LNG Expansion has major and severe implications for the TMJ EA including the Upstream GHG Assessment, and cumulative effects. Recently, FortisBC has repealed this statement and are adamant that the FortisBC Phase 2 Expansion is not dependent on TMJ or vice versa. Tsleil-Waututh Nation emailed ECCC on February 5, 2020 and again on April 9th 2020 to receive clarification regarding the Upstream GHG Assessment and the link between the two Projects. ECCC continues to highlight "the uncertainty with the likely feasibility of a No Project Case that sees significant volumes of LNG shipped in ISO containers"[241] due to the lack of information regarding relative costs and competitiveness of ISO container trade. Tsleil-Waututh Nation views this issue as outstanding and expects our concern be acknowledged and considered for decision-making.

Concerns regarding the assessment of Cultural Impacts and the incorporation of Indigenous Knowledge

Tsleil-Waututh Nation has raised throughout the assessment concerns regarding the assessment of impacts on cultural values. The application failed to capture either the interrelatedness of biophysical and cultural impacts, or the ripple effect that project impacts often have with respect to non-tangible dimensions of key cultural values, and this was not adequately addressed throughout the consultation process. The "Cultural Component" of Aboriginal Interests, particularly impacts on Tsleil-Waututh Nation intangible cultural heritage and Tsleil-Waututh Nation cultural health, are still missing. Tsleil-Waututh Nation is of the view that the potential for adverse effects on Tsleil-Waututh Nation 's Aboriginal Interests has not yet been avoided, minimized or otherwise accommodated to an acceptable level. These cultural components are underrepresented from the Crown's residual effects analyses because they are

[239] *TWN and FortisBC Nov. 28, 2019 Meeting Minutes.*

[240] *FortisBC Tilbury Expansion Project Initial Project Description.*

[241] *Email from ECCC to Tsleil-Waututh Nation, dated August 5, 2020.*

more difficult to measure. Consequently, it is imperative that Indigenous perspectives be acknowledged and used for decision making when determining impacts on culture.

E. CONCLUSION

Despite collaborative efforts during the EA process with the EAO and the Agency, not all of Tsleil-Waututh Nation concerns or interests regarding TMJ have been addressed or resolved. The outstanding major issues highlighted in this section are a mere summary of the many significant concerns raised by Tsleil-Waututh Nation with the EAO and the Agency throughout the EA process, including our detailed comments on the Assessment Report (Part B and Part C) and EAO documents. Tsleil-Waututh Nation's critique of the review process falls into four primary categories:

- *Failure to adequately consider impacts to Aboriginal rights and title;*
- *Failure to appropriately characterize and assess impacts;*
- *Failure to adequately consider cultural values; and*
- *Unnecessary burdens on the Nation due to continuing with a business-as-usual scenario during a global pandemic.*

Given this, and as mentioned above, Tsleil-Waututh Nation has a number of outstanding concerns with the TMJ assessment and with the overall infringement on Tsleil-Waututh Nation rights due to TMJ effects. Tsleil-Waututh Nation currently expects and requires that no decision maker come to a decision on TMJ until Tsleil-Waututh Nation's major concerns regarding TMJ are addressed. If an EAC is issued for TMJ considering current Project effects, Tsleil-Waututh Nation will view that decision as a contradiction to UN Declaration.

14.8.4 COMMUNITY PROFILE

The Tsleil-Waututh Nation are the people of Burrard Inlet, where their First People were created, and their ancestors have lived since time out of mind. Tsleil-Waututh Nation is a distinct community within the broader Coast Salish Nations. The modern Tsleil-Waututh Nation is governed by a chief and six councillors with four-year terms and is presently engaged in the BC Treaty process. Planning and decision making by Tsleil-Waututh Nation within their territory is guided by the Tsleil-Waututh Stewardship Policy[242], the modern articulation of Tsleil-Waututh

[242] *Tsleil-Waututh Nation (2009) Tsleil-Waututh Nation Stewardship Policy.*

Nation's traditional stewardship responsibilities. Tsleil-Waututh Nation is also part of the Naut'sa Mawt Tribal Council[243].

In pre-contact and early historic times, Tsleil-Waututh Nation people spoke the down-river dialect of Halkomelem called həńqəmińəm[244]. Resulting from a series of marriages in historic times, many Tsleil-Waututh Nation people also began speaking the Squamish language. Presently there are very few aboriginal language speakers within the Tsleil-Waututh Nation community and expanding traditional language education is a high priority for the community.

The majority of registered Tsleil-Waututh Nation members live at Burrard Inlet IR No. 3 (Sleil-Waututh or Burrardview), just east of Second Narrows in North Vancouver. Tsleil-Waututh Nation has two additional small reserves (Inlailawatash IR No.4 and IR No.4a) on opposite banks of the Indian River, just upstream of the Indian River estuary. As of October 2018, there were 597 registered members of the Tsleil-Waututh Nation, of which 336 (or 56 percent) live on IR No.3[243]. The Tsleil-Waututh Nation community is growing rapidly due to both internal growth and expanding membership to previously disenfranchised relatives.

The Tsleil-Waututh Nation Consultation Area encompasses much of the Lower Mainland (including the TMJ area), extending from Mount Garibaldi and the Squamish Valley in the north, to Gibsons in the west, the 49th parallel in the south, and the lower Fraser River to about the Alouette River in the east. This consultation area is defined by TUS evidence of Tsleil-Waututh Nation member land and resource use, and includes both Tsleil-Waututh Nation's traditional territory, and the territories of other First Nations that were accessed via traditional protocols.

In pre-contact times, Tsleil-Waututh Nation ancestors accessed the resources of the Consultation Area, including the TMJ area, from their primary homes in Burrard Inlet via a seasonal round. The lower Fraser River was accessed by Tsleil-Waututh Nation people via canoe (from around Point Grey) and by foot via a trail from New Westminster to Port Moody[245,246].

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[243] *Aboriginal Affairs and Northern Development Canada (2018) First Nations Profiles. http://fnp-ppn.aandc-aadnc gc.ca/fnp/Main/Search/FNRegPopulation.aspx?BAND_NUMBER=549&lang=eng. Accessed November 14, 2018.*

[244] *Arnett, Chris, and Jesse Morin (2018) The Rock Art/Xela:ls of the Tsleil-Waututh: A Historicized Coast Salish Practice. Ethnohistory 65:101-128.*

[245] *Hayes, Derek (2005) Historical Atlas of Vancouver and the Lower Fraser Valley. Douglas & McIntyre, Vancouver pp. 31.*

[246] *Morin, Jesse (2015) Tsleil-Waututh Nation's History, Culture and Aboriginal Interests in Eastern Burrard Inlet. Prepared for Gowlings, Lafleur, Henderson LLP. Submitted to the National Energy Board pp. 230-232.*

In the late summer, Tsleil-Waututh Nation people would move to the lower Fraser River to mass-harvest and dry sockeye salmon[247]. In the spring, Tsleil-Waututh Nation people would move to the lower Fraser River to mass-harvest and dry eulachon[248]. These dried fish were brought back to the primary Tsleil-Waututh Nation settlements in Burrard Inlet where they were consumed during winter months. While the sockeye and eulachon fisheries were the most important to Tsleil-Waututh Nation, sturgeon, chum salmon, pink salmon, chinook/spring salmon and steelhead were also fished on the lower Fraser River.

While eulachon is no longer harvested, sockeye salmon is still harvested from the lower Fraser River and is the most important traditional food still available to Tsleil-Waututh Nation[249,250]. Tsleil-Waututh Nation's TUS information indicates that the lower Fraser River from the Salish Sea to about the Allouette River has been actively fished by Tsleil-Waututh Nation people in recent decades, including the TMJ area. TMJ is located within Tsleil-Waututh Nation's FSC salmon fishing area on the lower Fraser River[251].

For the past century, industrial development has increased rapidly in and along the Fraser River, resulting in a steady decline in the resources and limitations in accessing marine foods.

Tsleil-Waututh Nation, who are stewards of the lands and waters throughout the territory, has been actively aiming to restore the health of the waters of the territory throughout numerous initiatives, such as implementing habitat restoration projects and removing creosote pilings. Tsleil-Waututh Nation stands by the principle of "net environmental gain" for all projects throughout the territory, rather than a perspective based on mitigating impacts for "no net environmental loss", as a means to improve the health of the territory. This Tsleil-Waututh Nation principle considers that current conditions throughout the territory are already at a loss, compared to pre-industrial times. Tsleil-Waututh Nation also issues Cultural Heritage Investigation Permits for archaeological work across the territory and sends Tsleil-Waututh Nation archaeological monitors to work on-site with project archaeologists. In addition, Tsleil-

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[247] *Morin, Jesse (2015) Tsleil-Waututh Nation's History, Culture and Aboriginal Interests in Eastern Burrard Inlet. Prepared for Gowlings, Lafleur, Henderson LLP. Submitted to the National Energy Board pp. 308-310.*

[248] *Morin, Jesse (2015) Tsleil-Waututh Nation's History, Culture and Aboriginal Interests in Eastern Burrard Inlet. Prepared for Gowlings, Lafleur, Henderson LLP. Submitted to the National Energy Board pp. 298-301.*

[249] *Morin, Jesse (2015) Tsleil-Waututh Nation's History, Culture and Aboriginal Interests in Eastern Burrard Inlet. Prepared for Gowlings, Lafleur, Henderson LLP. Submitted to the National Energy Board pp. 336,399.*

[250] *Morin, Jesse (2016) Tsleil-Waututh Nation Traditional Use Study Review in Relation to the WesPac Tilbury Marine Jetty Project (14-211). Report prepared for Tsleil-Waututh, Treaty, Lands and Resources Department. Tsleil-Waututh Nation pp. 25.*

[251] *Aboriginal Fisheries Strategy (2016) Department of Fisheries and Oceans AFS2016-MLT-1650-0.*

Waututh Nation sends environmental monitors to work on-site with project environmental monitors. Tsleil-Waututh Nation monitors are fulfilling the stewardship responsibilities of the Nation in addition to gaining valuable experiential training in the fields of natural and cultural resource management.

Tsleil-Waututh Nation undertakes a holistic approach in their review of projects across the territory as the impacts on Tsleil-Waututh Nation are also holistic and cumulative in scope.

Tsleil-Waututh Nation has witnessed the cumulative, declining health of the lands and waters of the territory, largely due to settlement and industrialization which are intrinsically linked to climate change. The declining health of the territory not only impacts the environment, but in turn, the cultural, physical, mental, social and economic health of the Tsleil-Waututh Nation community. Climate change is projected to negatively alter the abundance of marine species harvested by coastal First Nations in British Columbia[252] and to better understand cumulative effects (particularly within Burrard Inlet), Tsleil-Waututh Nation has begun a Cumulative Effects Monitoring Initiative as well as the development of a Climate Change Resiliency Action Plan. Tsleil-Waututh Nation has developed relationships with industry and governmental agencies and organized conferences, such as the Climate Summit and the Burrard Inlet Science Symposium, to promote the importance of taking action to restore the health of the lands and waters for everyone's benefit.

Tsleil-Waututh Nation currently owns or is part of a diverse array of businesses which are run through the Economic Development Department. This includes, but is not limited to: Inlailawatash Limited Partnership (natural and cultural resources management), SPAL General Contractors Corporation (joint ventures/construction services), Takaya Developments (real estate), MST Development Corporation (real estate), Salish Seas (fisheries), Takaya Golf Centre (golf), and Takaya Tours (Aboriginal Tourism).

In summary, Tsleil-Waututh Nation aims to expand its participation in all planning and development processes that take place within the Consultation Area in order to fulfill the Nation's role as stewards of the lands, waters and resources of the territory, to protect Tsleil-Waututh Nation Aboriginal rights, title and interests, and to create greater economic and social results that can be equitably shared.

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[252] *Marushka L, Kenny TA, Batal M, Cheung WWL, Fediuk K, et al. (2019) Potential impacts of climate-related decline of seafood harvest on nutritional status of coastal First Nations in BC, Canada. PLOS ONE 14(2): e0211473. https://doi.org/10.1371/journal.pone.0211473*

14.8.5 TSLEIL-WAUTUTH NATION CULTURAL HEALTH

Cultural health is defined here as the relative state of an individual's or group's (collection of individuals) affiliation with, knowledge of and fluency in practice and transmission of the ideas and principles of a specific culture, and the sense of belonging and meaning attained through participation in that culture. High levels of cultural health include high rates of participation and fluency in a given culture, high rates of a sense of meaning and belonging from participating/practicing that culture, and low rates of culture stress.

In relation to Tsleil-Waututh Nation's traditional Coast Salish culture, Tsleil-Waututh Nation's cultural health refers to:

- *The ability of Tsleil-Waututh Nation people to actively participate in all aspects of their traditional culture;*
- *The ability of Tsleil-Waututh Nation people to transmit (teach) their culture to younger generations; and*
- *The sense of identity, meaning and satisfaction derived by people from participating in their traditional culture.*

The term culture stress is used here as description of a range of factors and attributes that negatively affect an individual's cultural health. That is, the greater the culture stress one experiences, the poorer one's cultural health. As defined by the Canadian Royal Commission Report:

Culture stress is a term used to refer to the loss of confidence in the ways of understanding life and living that have been taught within a particular culture. It comes about when the complex of relationships, knowledge, languages, social institutions, beliefs, values, and ethical rules that bind a people and give them a collective sense of who they are and where they belong is subjected to change. For aboriginal people, such things as loss of land and control over living conditions, suppression of belief systems and spirituality, weakening of social and political institutions, and racial discrimination have seriously damaged their confidence and thus predisposed them to suicide, self-injury and other self-destructive behaviours[253].

[253] *Canada (1995) Suicide Among Aboriginal People. Royal Commission Report. Research Branch, Library of Parliament, Ottawa pp 4-5. https://publications.gc.ca/site/eng/9.564711/publication.html*

Cultural fluency as used here refers to one's knowledge of a given culture and ability to teach and transmit that culture. No one can be an expert in all aspects of one's culture, but high levels of cultural fluency with respect to Tsleil-Waututh Nation's Coast Salish culture include:

- *A general understanding of Coast Salish culture in diverse settings or occasions;*
- *Internalized or emotive responses for specific cultural events;*
- *The ability to teach and explain the culture to younger generations or outsiders; and*
- *The ability to seek out specialists within the culture for advice or teachings.*

These three concepts – cultural health, culture stress, and cultural fluency – are interrelated and essential for understanding Tsleil-Waututh Nation's perspective of their cultural health. It is a high priority for Tsleil-Waututh Nation to increase the cultural health of community members by increasing opportunities for members' participation in aspects of their traditional Coast Salish culture.

14.8.6 IMPACTS TO TSLEIL-WAUTUTH NATION CULTURAL HEALTH AND RIGHT TO PRACTICE THEIR CULTURE

14.8.6.1 IMPACTS TO TSLEIL-WAUTUTH NATION'S RIGHT TO PRACTICE THEIR CULTURE (SOUTHERN RESIDENT KILLER WHALES)

14.8.6.1.1 TRANSIT OF VESSELS

While the exact number of vessels docking/loading at TMJ is expected to vary with market conditions, TJLP estimates that up to 68 LNG carriers and 69 LNG bunker vessels could dock at the jetty per year in the Application scenario[254,255]. Of those 69 bunker vessels, a maximum of 50 bunker vessels would transit the marine shipping area. All 68 LNG carriers would transit the marine shipping area. TJLP assumed that there would be three tugs per carrier or bunker vessel. For the BVS[256], TJLP estimates up to 365 LNG vessel calls per year (on average, one call daily), with a vessel mix of 307 bunker vessels and up to 58 LNG carriers. These ship movements would result in approximately 730 trips inbound and outbound annual maximum. For the BVS, TJLP

[254] *WesPac (2019) WesPac Tilbury Marine Jetty Project: Environmental Assessment Certificate Application. Section 1.0: Overview of the Proposed Project Proponent.*

[255] *WesPac (2020) WesPac Tilbury Marine Jetty Project: Marine Shipping Assessment. Section 1.0 Introduction. Submitted to BC Environmental Assessment Office by WesPac Midstream-Vancouver LLC.*

[256] *Tilbury Jetty Limited Partnership (2022). Tilbury Marine Jetty Project: Bunker Vessel Scenario/ Submitted to BC Environmental Assessment Office by Tilbury Jetty Limited Partnership.*

assumed that no tugs would be required for bunker vessels. However, if the bunker vessels are not built in the anticipated time for this Project, there is still uncertainty if tugs will be required as the EAO states that it is the Port of Vancouver's decision. Furthermore, TJLP is unable to provide the proportion of LNG versus diesel fueled vessels if the bunker vessels are built. This uncertainty does not allow TWN to make an informed decision. In addition, there will be annual tug-assisted barges loads every year to support maintenance dredging. These ship movements would result in additional vessel movements through the TMJ area per year. In addition, construction will result in additional movements of vessels (barge and a tug) due to dredging.

Given the extensive shipping that already passes through the southern Salish Sea between the project area and the Pacific Ocean, and the additional marine shipping through these channels proposed by several other major projects in the region (e.g., TMX, RBT2 and Port Mann), TMJ will certainly increase the frequency of vessel transit through an already busy shipping area.

All available evidence indicates that increased marine shipping through SRKW critical habitat will: decrease SRKW feeding opportunities through masking from increased underwater noise, affect SRKW communication due to underwater noise, and increase the frequency of vessels striking SRKWs[257]. As the TMJ project assessment relies on mitigations that are either not true mitigations (ex. Reporting of accidental contacts between vessels and marine mammals) or are not TMJ specific with adequate enforcement (ex. Regional initiatives), Tsleil-Waututh Nation concludes that there is very high probability that such project-related negative effects will impact SRKWs. The precarious state of present SRKW populations makes any possible negative effects to SRKW likely to drive them to extinction[258,259].

As discussed above, Tsleil-Waututh Nation maintains an important and ongoing cultural relationship with killer whales that links them to spiritual power, to their past ancestors, the passage of their ancestors to the hereafter, and view the presence of killer whales as a

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[257] *Roberts Bank Terminal 2 Project (2020). Federal Review Panel Report for the Roberts Bank Terminal 2 Project. Prepared by the Review Panel for the Roberts Bank Terminal 2 Project. March 27, 2020. Impact Assessment Agency of Canada.*

[258] *Fisheries and Oceans Canada (2018). Recovery Strategy for the Northern and Southern Resident Killer Whales (Orcinus orca) in Canada. https://www.sararegistry.gc.ca/virtual_sara/files/plans/Rs- ResidentKillerWhale-v00-2018Aug-Eng.pdf. Accessed May 29, 2020.*

[259] *Roberts Bank Terminal 2 Project (2020). Federal Review Panel Report for the Roberts Bank Terminal 2 Project. Prepared by the Review Panel for the Roberts Bank Terminal 2 Project. March 27, 2020. Impact Assessment Agency of Canada, pp 208-209.*

barometer of the health of their territory[260,261,262]. Tsleil-Waututh Nation people assert that the loss of killer whales from their territory would partially sever the means of connecting with their ancestors, interfere with the passage of deceased Tsleil-Waututh Nation people to the hereafter, and demonstrate the poor state of health of their territory. Tsleil-Waututh Nation people view their cultural connection to killer whales as a significant part of their traditional Coast Salish culture, and that the maintenance of this cultural connection is important for the cultural health of Tsleil-Waututh Nation people.

14.8.6.1.1.1 Severity of Residual Effects -- Impacts on Tsleil-Waututh Nation Cultural Health

In the section above, the TMJ-related residual impacts to Tsleil-Waututh Nation cultural health were identified: the increased incidence of vessels strikes of SRKWs and an increase in underwater noise reducing SRKW foraging times possibly resulting in the extinction of SRKWs. Because of Tsleil-Waututh Nation's close cultural relationship with killer whales, from Tsleil-Waututh Nation's perspective, the loss of SRKWs would negatively impact the cultural health of their community members. The severity of this impact on Tsleil-Waututh Nation's cultural heritage can be assessed using the methods described above.

- *The duration of the impact (i.e., the decrease in Tsleil-Waututh Nation's ability to practice their traditional culture resulting from the extinction of SRKW) would be permanent;*
- *The impact to Tsleil-Waututh Nation's ability to practice their traditional culture would be irreversible; and*
- *The cumulative effects to Tsleil-Waututh Nation's ability to practice their traditional culture with killer whales has been extreme since AD 1792.*

Thus, the loss of SRKWs would be a profound negative impact to Tsleil-Waututh Nation's traditional culture. The severity of this impact to Tsleil-Waututh Nation's ability to practice their ongoing traditional Coast Salish culture is assessed at extreme.

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[260] Barnett, Homer (1955). The Coast Salish of British Columbia. University of Oregon Press, Eugene, Oregon, pp. 79.

[261] MacDonald, Colleen, Diana Drake, John Doerksen, and Michael Cotton (1998). Between Forest and Sea: Memories of Belcarra. Belcarra Historical Group, Belcarra B.C., pp. 15.

[262] Morin, Jesse (2018a). Review of the Impact of the Trans Mountain Expansion Project on Tsleil-Waututh Nation's Cultural Relationship with Killer Whales Prepared for Gowlings, Lafleur, Henderson LLP. Submitted to the National Energy Board.

14.8.6.1.2 ACCIDENTS AND MALFUNCTIONS

Accidental spills, emissions, or explosions have a low probability of occurring, but carry very significant potential negative effects to salmonids, particularly Chinook Salmon. Such accidents would, of course, vary in magnitude, and smaller accidents would have a much higher probability of occurring than large catastrophic accidents. If spills or accidents occurred during a time when spawning salmon were ascending the Fraser River, or when juvenile salmon were descending it and were to harm the fish, even relatively small spills or accidents could decrease the quantity of returning Chinook salmon. Furthermore, larger spills could affect water quality and important fish habitat, resulting in negative impacts on Chinook salmon populations. Relatively large spills or accidents at important migration and breeding times or in important fish habitat would have catastrophic negative effects on Chinook salmon and consequently, could have a catastrophic effect on SRKW.

Furthermore, environmental pollutants have been identified as one of the main threats facing SRKW. Any increase in pollutants and reduction in water quality in SRKW Critical Habitat could have a significant effect on SRKWs including the impairment of immune responses and lower fecundity. SRKWs are already endangered and may currently be at a tipping point beyond which further reduction of their primary food source (chinook salmon) and further increase in pollutants could realistically drive SRKWs to extinction[258,259].

Tsleil-Waututh Nation people hold a close cultural relationship with killer whales[263,261]. This relationship includes a complex network of beliefs and practices including: tribal identity, obtaining spirit power from killer whales, transporting the souls of passed Tsleil-Waututh Nation people to the land of the dead, cultural visits by past ancestors in the form of killer whales, and perhaps reincarnation of past Tsleil-Waututh Nation leaders as killer whales[262]. Further, Tsleil-Waututh Nation people view the presence of killer whales in their territory as a barometer of health of the environment. Loss of killer whales would greatly impair Tsleil-Waututh Nation's ability to practice their traditional Coast Salish culture, and would be viewed by Tsleil-Waututh Nation as a sign of the poor health of their territory.

14.8.6.1.2.1 Severity of Residual Effects -- Impacts on Tsleil-Waututh Nation Cultural Health

The potential TMJ-related residual effect on Tsleil-Waututh Nation's cultural relationship with killer whales was identified above, via a cascade of negative effects to chinook habitat, mature

[263] *Barnett, Homer (1955) The Coast Salish of British Columbia. University of Oregon Press, Eugene, Oregon, pp. 79.*

chinook populations, impacts to water quality from increased pollution resulting in a corresponding loss of SRKW populations (i.e., extinction). This potential impact is considered, by Tsleil-Waututh Nation, as a negative impact to Tsleil-Waututh Nation's cultural health as defined above. The severity of this residual effect on Tsleil-Waututh Nation's cultural relationship with killer whales can be assessed using the methods described above.

- *The duration of the impact (loss of cultural connection with killer whales via extinction of SRKW) would be permanent;*
- *The loss of the Tsleil-Waututh Nation's cultural connection to killer whales would not be reversible if SRKW populations were driven to extinction; and*
- *The cumulative effects to Tsleil-Waututh Nation's ability to practice their traditional culture with killer whales has been extreme since AD 1792.*

The severity of this impact to Tsleil-Waututh Nation's cultural relationship with killer whales and their ability to practice their ongoing traditional Coast Salish culture is assessed at extreme. It is emphasized that Tsleil-Waututh Nation views ongoing participation in their traditional Coast Salish culture as a key part of maintaining and improving their cultural health.

14.8.6.1.3 DESTRUCTION OF FISH HABITAT

Several components of TMJ are anticipated to result in a loss of fish habitat[264] that TJLP indicates will be fully mitigated[230,232]. It is Tsleil-Waututh Nation's perspective that there is a low probability that the proposed mitigations would result in no net loss of fish habitat (especially chinook salmon), and a much higher probability that the proposed mitigations will result in a net loss of fish habitat (further described below). A net loss of habitat for chinook salmon is anticipated to decrease adult chinook populations[265]. A further decrease in chinook salmon populations will decrease the availability of preferred prey of SRKW. SRKWs are already endangered and may currently be at a tipping point beyond which further reduction of their primary food source (chinook salmon) could realistically drive SRKWs to extinction[258,259].

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[264] *WesPac (2019) WesPac Tilbury Marine Jetty Project: Environmental Assessment Certificate Application. Section 4.2: Fish and Fish Habitat. Submitted to BC EAO by WesPac Midstream- Vancouver LLC.*

[265] *COSEWIC (2018). COSEWIC assessment and status report on the Chinook Salmon Oncorhynchus tshawytscha, Designatable Units in Southern British Columbia in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xxxi + 283 pp*. (https://publications.gc.ca/collections/collection_2019/eccc/CW69-14-469-2019-eng.pdf).

Tsleil-Waututh Nation people hold a close cultural relationship with killer whales[263,261]. This relationship includes a complex network of beliefs and practices including: tribal identity, obtaining spirit power from killer whales, transporting the souls of passed Tsleil-Waututh Nation people to the land of the dead, cultural visits by past ancestors in the form of killer whales, and perhaps reincarnation of past Tsleil-Waututh Nation leaders as killer whales[262]. Further, Tsleil-Waututh Nation people view the presence of killer whales in their territory as a barometer of health of the environment. Loss of killer whales would greatly impair Tsleil-Waututh Nation's ability to practice their traditional Coast Salish culture, and would be viewed by Tsleil-Waututh Nation as a sign of the poor health of their territory.

14.8.6.1.3.1 Severity of Residual Effects -- Impacts on Tsleil-Waututh Nation Cultural Health

The potential TMJ-related residual effect on Tsleil-Waututh Nation's cultural relationship with killer whales was identified above, via a cascade of negative effects to chinook habitat, mature chinook populations, and a corresponding loss of SRKW populations (i.e., extinction). This potential impact is considered, by Tsleil-Waututh Nation, as a negative impact to Tsleil-Waututh Nation's cultural health as defined above. The severity of this residual effect on Tsleil-Waututh Nation's cultural relationship with killer whales can be assessed using the methods described above.

- *The duration of the impact (loss of cultural connection with killer whales via extinction of SRKW) would be permanent.*
- *The loss of the Tsleil-Waututh Nation's cultural connection to killer whales would not be reversible if SRKW populations were driven to extinction.*
- *The cumulative effects to Tsleil-Waututh Nation's ability to practice their traditional culture with killer whales has been extreme since AD 1792.*

The severity of this impact to Tsleil-Waututh Nation's cultural relationship with killer whales and their ability to practice their ongoing traditional Coast Salish culture is assessed at extreme. It is emphasized that Tsleil-Waututh Nation views ongoing participation in their traditional Coast Salish culture as a key part of maintaining and improving their cultural health.

14.8.6.2 IMPACTS TO TSLEIL-WAUTUTH NATION'S RIGHT TO PRACTICE THEIR CULTURE (SACRED TUNNELS)

14.8.6.2.1 TRANSIT OF VESSELS

The transit of TMJ-related vessels and tugs through the study area, especially near Tsawwassen and Point Roberts, pass close to a place of profound spiritually significance to Tsleil-Waututh Nation people who follow their traditional Coast Salish culture. Traditional Coast Salish cosmology includes the belief in a network of underwater tunnels or passageways (mystical tunnels) that connect various places around the Halkomelem-speaking world of the Lower Mainland and the Lower Fraser River area[266,267,268,269,270,271].

These tunnels are not simply caves or passageways, but rather link to the realms of the xá:xa (sacred)[272]*. Fierce spiritual beings called stl'aleqem are understood to inhabit the areas near the entrances and exits of these tunnels*[268]*. Traditional Coast Salish ritual practice for people training to become shxwna:m (shaman, Indian Doctor) includes ritual bathing and spirit questing at these stl'aleqem places. According to recorded oral histories, the First Ancestor of the Tsawwassen people was granted "power over all the underground channels that lead from Point Roberts to Sechelt, Pitt Lake, and other places" by the Creator*[268]*. Then, the Creator launched him to the north, but "his vitality went into the deep water off Point Roberts, where it gave rise to the innumerable monsters that haunt the place. Right down to the middle of the nineteenth century the Indians used to bathe and purify themselves there in order to obtain supernatural power"*[268]*.*

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[266] *Carlson, Keith T. (2010) The Power of Place, The Problem of Time: Aboriginal Identity and Historical Consciousness in the Cauldron of Colonialism. University of Toronto Press, Toronto. pp. 7-11.*

[267] *Duff, Wilson (1952) The Upper Stalo Indians of the Fraser Valley, British Columbia. Anthropology in British Columbia Memoir 1. British Columbia Provincial Museum, Victoria. pp. 124.*

[268] *Jenness, Diamond (1955) The Faith of a Coast Salish Indian. British Columbia Provincial Museum, Department of Education, Victoria. pp. 11.*

[269] *Maud, Ralph (editor) (1978) The Salish People: The Local Contribution of Charles Hill-Tout Volume III: The Mainland Halkomelem. Talon Books, Vancouver. pp. 65.*

[270] *Robbins, Margaret (2010) Re-Imagining S'olh Temexw: Tunnel Narratives in a Sto:lo Spiritual Geography.*

Unpublished MA thesis, Department of History, University of Victoria.

[271] *Suttles, Wayne (1955) Katzie Ethnographic Notes. Anthropology Memoir In British Columbia 3. Provincial Museum, Department of Education, Victoria.*

[272] *Carlson, Keith T. (2010) The Power of Place, The Problem of Time: Aboriginal Identity and Historical Consciousness in the Cauldron of Colonialism. University of Toronto Press, Toronto. pp. 7, 64, 374.*

Tsleil-Waututh Nation-specific information and testimony is considered highly confidential and is not detailed directly here. Tsleil-Waututh Nation have raised concern of the potential impacts of increased marine shipping associated with large projects such as TMX and RBT2[273]. The findings of the RBT2 panel are cited at length below because, in Tsleil-Waututh Nation's opinion, the marine shipping from the two projects have the same potential impact. The RBT2 panel concluded the following regarding Tsleil-Waututh Nation's cultural relationship with the marine area of Tsawwassen and Point Roberts:

"The Panel believes that if the Project were to proceed, Tsleil-Waututh Nation would face a potential loss of preferred cultural and spiritual areas and the potential interruption of cultural practices resulting in reduced ability to transmit a way of life to future generations. Additionally, the Panel is of the view that the potential impairment of land use would result in an associated diminishment of cultural and spiritual experience including reduced ability to practice culture in a preferred manner, and reduced confidence in strength or power of cultural practices, particularly those associated with Transformer sites and sacred tunnels. The Panel recognizes that as a result, Tsleil-Waututh Nation may experience a loss of land and water-based opportunities for language transmission and loss of specific vocabulary associated with particular places or specific place-based orally transmitted cultural stories. The Panel understands that the resulting loss of knowledge would affect the entire Tsleil-Waututh Nation, and their desire to use their cultural practices to heal their community. The Panel concludes that there is a residual effect on Tsleil-Waututh Nation's access to preferred cultural heritage locations that encompass the cultural landscape of the Transformer sites and sacred tunnels within the Fraser River estuary and the Salish Sea, and more specifically the Stl'áleqem site near Roberts Bank. The potential effect on cultural practices may persist beyond one generation given the intergenerational transfer of knowledge required to continue the practice and may be permanent. ***The Panel concludes that there is a residual effect on the intangible cultural heritage of the Tsleil-Waututh. The potential effects of the Project are likely to cause an interference with the preferred manner of practice, including limiting use of, or access to sites that maintain a high community cultural and spiritual value despite previous industrial development in the Fraser River estuary. The marine shipping associated with the Project***

[273] *Morin, Jesse (2018b) Review of the Impact of the Trans Mountain Expansion Project on Tsleil-Waututh Nation's Mystical Tunnels. Prepared for Gowlings, Lafleur, Henderson LLP. Submitted to the National Energy Board.*

would also interact occasionally, but on a repeated basis in an area that overlaps with this cultural practice *(emphasis added)*[274]*.*

In Tsleil-Waututh Nation's opinion, the marine shipping associated with TMJ has the same potential impact to Tsleil-Waututh Nation's ongoing participation in their traditional Coast Salish culture as recognized by the RBT2 panel. That is, the potential residual effect would be interference with Tsleil-Waututh Nation people's ability to undertake traditional cultural practices in spiritually significant areas located in proximity to Tsawwassen and Point Roberts. There are no mitigations for this impact.

14.8.6.2.1.1 Severity of Residual Effects – Impacts on Tsleil-Waututh Nation Cultural Health

The preceding section identified TMJ-related negative impacts (via marine shipping) to Tsleil-Waututh Nation people's ability to undertake traditional cultural practices in the marine waters around Tsawwassen and Point Roberts. The severity of this impact on Tsleil-Waututh Nation's cultural health can be assessed using the methods described above.

- *The duration of the impact (shipping dissuading cultural use of the area) would be episodic (i.e., individual vessel transits), but these episodes would be frequent enough to make the duration of the impact the life of TMJ (AD 2053);*
- *The impact (increased shipping dissuading cultural use of the area) would be reversible through a reduction in vessel traffic; and*
- *The cumulative impact to Tsleil-Waututh Nation's cultural use of this area since AD 1792 would be extreme.*

Based on these attributes, the severity of the impact on Tsleil-Waututh Nation people's ability to participate in their traditional Coast Salish culture is assessed as extreme and impairs members' cultural health.

14.8.6.2.2 ACCIDENTS AND MALFUNCTIONS

As described above, the marine waters off of Tsawwassen and Point Roberts hold profound spiritual significance to Tsleil-Waututh Nation people who follow their traditional Coast Salish culture. The supernatural beings and features in this area are, in Tsleil-Waututh Nation's opinion, negatively affected by pollution, including light, noise, and physical/chemical

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[274] *Roberts Bank Terminal 2 Project (2020) Federal Review Panel Report for the Roberts Bank Terminal 2 Project. Prepared by the Review Panel for the Roberts Bank Terminal 2 Project. March 27, 2020. Impact Assessment Agency of Canada. pp. 308.*

pollution[275]. Further, Tsleil-Waututh Nation people require clean water that is free from noise and light pollution for undertaking ritual bathing[276,277]. If an accidental spill of any magnitude were to occur in this area, Tsleil-Waututh Nation would perceive the resulting pollution to impair the spiritual forces of the area and dissuade Tsleil-Waututh Nation people from ritually bathing in the area[275]. If pollution impairs the spiritual forces in this area, it follows then that Tsleil-Waututh Nation people would be less able to obtain spirit power from them. And if the general area becomes polluted, Tsleil-Waututh Nation people will be dissuaded from undertaking ritual bathing in the area. The impact of accidental spills or pollution in the marine waters off of Tsawwassen and Point Roberts would negatively affect Tsleil-Waututh Nation peoples' ability to participate in their traditional culture and spiritual practices.

Even with the proposed mitigations, an accident or malfunction could still occur. Given that there are no mitigations for such a potential impact, this effect is considered residual (see also conclusions of the RBT2 panel 2020:308 cited above).

14.8.6.2.2.1 Severity of Residual Effects -- Impacts on Tsleil-Waututh Nation Cultural Health

Accidents or spills in the vicinity of Tsawwassen and Point Roberts were identified as having a potential negative impact on Tsleil-Waututh Nation people's ability to participate in their traditional Coast Salish culture. From Tsleil-Waututh Nation's perspective, this would negatively affect members' cultural health. The severity of this impact on Tsleil-Waututh Nation's cultural health can be assessed using the methods described above.

- *The duration of the impact (accident or spill impacting spiritual powers or dissuading Tsleil-Waututh Nation use) would be permanent for the life of TMJ (AD 2053);*
- *The impact would not be reversible through spill cleanup procedures; and*
- *The cumulative impact to Tsleil-Waututh Nation's cultural use of this area since AD 1792 would be extreme.*

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[275] Morin, Jesse (2018b) Review of the Impact of the Trans Mountain Expansion Project on Tsleil-Waututh Nation's Mystical Tunnels. Prepared for Gowlings, Lafleur, Henderson LLP. Submitted to the National Energy Board. pp. 14-15.

[276] Morin, Jesse (2015) Tsleil-Waututh Nation's History, Culture and Aboriginal Interests in Eastern Burrard Inlet. Prepared for Gowlings, Lafleur, Henderson LLP. Submitted to the National Energy Board. pp. 404.

[277] Morin, Jesse (2018b) Review of the Impact of the Trans Mountain Expansion Project on Tsleil-Waututh Nation's Mystical Tunnels. Prepared for Gowlings, Lafleur, Henderson LLP. Submitted to the National Energy Board. pp. 7.

Based on these attributes, the severity of the impact on Tsleil-Waututh Nation people's ability to participate in their traditional Coast Salish culture is assessed as extreme and impairs members' cultural health.

14.8.6.3 IMPACTS TO COAST SALISH HERITAGE

14.8.6.3.1 DREDGING

Dredging of the Fraser River within the TMJ area has the potential to impact archaeological materials. More specifically, there is the potential to damage waterlogged organic archaeological materials (wet sites) and artifacts that are buried and embedded in the silts of the Fraser River[278,279]. Significant archaeological wet sites are recorded just upstream of the project area (Eldridge 2017), and a large archaeological Coast Salish fishing area and possible fish weir have been recorded on the north bank of the Fraser River immediately opposite the TMJ area (DgRs-17)[280,281]. The proximity of known wet sites to the TMJ area makes the presence of wet site archaeological materials in the river bed within the TMJ area very likely. Given the scientific and cultural importance of wet site archaeological deposits, and the rarity of wet sites in this area due to the extensive development that has likely destroyed wet sites during past development activities, every precaution should be taken to protect and preserve archaeological wet site materials.

Given that TJLP (2015, 2020) has provided no indication that they will have archaeologists inspect or examine the dredge sediments from the Fraser River, there is essentially no chance of recovery of potential wet site archaeological materials. If potential archaeological materials are destroyed through the construction of TMJ, then this would directly and negatively impact Tsleil-Waututh Nation's Aboriginal interests. More specifically, the dredging associated with TMJ has the potential to negatively impact Coast Salish cultural heritage and Tsleil-Waututh Nation's ability to protect, to gain knowledge of, and to celebrate their traditional culture and history. Since TJLP offers no mitigation for this potential impact, it can be considered a residual effect.

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[278] *Borden, Charles (1969) The Skagit River Atlatl: A Reappraisal. BC Studies 1:13-19.*

[279] *Fladmark, Knut, D.E. Nelson, T.A. Brown, J.S. Vodel, and J.R. Southon (1987) AMS Dating of Two Wooden Artifacts from the Northwest Coast. Canadian Journal of Archaeology 11:1-12.*

[280] *Maclachlan, Morag (editor) (1998) The Fort Langley Journals, 1827-30. UBC Press, Vancouver. pp. 8.*

[281] *McHalsie, Albert (Sonny) (2007) We Have to Take Care of Everything That Belongs to Us. In Be of Good Mind: Essays on the Coast Salish, edited by B. Miller, pp. 82-130. UBC Press, Vancouver. pp. 141.*

14.8.6.3.1.1 Severity of Residual Effects -- Impacts on Tsleil-Waututh Nation Cultural Health

The TMJ-related dredging was identified above as having potential residual effect of negative impact on Coast Salish cultural heritage. The severity of this impact on Tsleil-Waututh Nation's cultural heritage can be assessed using the methods described above.

- *The duration of the impact (negative impacts to cultural heritage) would be brief, but permanent;*
- *The impact to cultural heritage would be irreversible; and*
- *The cumulative effects of negative impacts to Tsleil-Waututh Nation's cultural heritage since AD 1792 has been extreme.*

The potential negative impacts of dredging on cultural heritage is assessed at low to high.

14.8.6.3.2 TRANSIT OF VESSELS

While the exact number of vessels docking/loading at TMJ is expected to vary with market conditions, TJLP estimates that up to 68 LNG carriers and 69 LNG bunker vessels could dock at the jetty per year in the Application scenario[254,255]. Of those 69 bunker vessels, a maximum of 50 bunker vessels would transit the marine shipping area. All 68 LNG carriers would transit the marine shipping area. TJLP assumed that there would be three tugs per carrier or bunker vessel. For the BVS[282], TJLP estimates up to 365 LNG vessel calls per year (on average, one call daily), with a vessel mix of 307 bunker vessels and up to 58 LNG carriers. These ship movements would result in approximately 730 trips inbound and outbound annually. In addition, there will be annual tug-assisted barges loads every year to support maintenance dredging. These ship movements would result in additional vessel movements through the TMJ area per year. In addition, construction will result in additional movements of vessels (barge and a tug) due to dredging.

Given the extensive marine shipping traffic that currently passes through the southern Salish Sea between the project area and the Pacific Ocean, and the additional marine shipping proposed by several other major projects in the region (e.g., TMX, RBT2), the increase in marine vessel traffic proposed by TMJ will contribute to the cumulative erosion of cultural heritage.

Tsleil-Waututh Nation has continuously raised concerns regarding the impacts of increase vessel traffic and vessel wake. Vessel wake can cause increased shoreline erosion which can

[282] *Tilbury Jetty Limited Partnership (2022). Tilbury Marine Jetty Project: Bunker Vessel Scenario/ Submitted to BC Environmental Assessment Office by Tilbury Jetty Limited Partnership.*

result in the destruction of important Coast Salish heritage. Vessel wake caused by TMJ will likely impact known and potential archaeological materials located along the shorelines of the proposed marine shipping routes for this project. TJLP has committed to bathymetry studies close to the TMJ site however, Tsleil-Waututh Nation continues to raise concerns around the effectiveness of this methodology. In addition, there are no mitigations for the potential effects described above beyond the immediate TMJ site[232].

14.8.6.3.2.1 Severity of Residual Effects -- Impacts on Tsleil-Waututh Nation Cultural Health

An increase in vessel traffic and resulting wake and shoreline erosion could cause further destruction of important Coast Salish heritage. The severity of this impact on Tsleil-Waututh Nation's cultural heritage can be assessed using the methods described above.

- *The duration of the impact (negative impacts to cultural heritage) would be brief, but permanent;*
- *The impact to cultural heritage would be irreversible; and*
- *The cumulative effects of negative impacts to Tsleil-Waututh Nation's cultural heritage since AD 1792 has been extreme.*

The potential negative impacts of dredging on cultural heritage is assessed at low to high.

14.8.6.4 CLIMATE CHANGE AND IMPACTS TO TSLEIL-WAUTUTH NATION'S CULTURAL HEALTH AND RIGHT TO PRACTICE THEIR CULTURE

TMJ is anticipated to emit GHGs throughout all phases. Emissions include CO_2, methane and nitrous oxide. Tsleil-Waututh Nation raised numerous concerns throughout the EA regarding the inadequacy of the GHG assessment and the Upstream GHG assessment. The scope did not include all potential downstream and upstream effects (including indirect emissions) resulting in a faulty assessment. In addition, the No Project Case for the Upstream GHG Assessment relied on the conclusion that TMJ did not consist of a new source of LNG. Tsleil-Waututh Nation raised concerns regarding this conclusion, the feasibility of the No Project Case and the link between TMJ and the FortisBC Phase 2 Expansion Project (as described above).

Climate change has the potential to profoundly impact Tsleil-Waututh Nation and many aspects of community life and cultural health. The IPCC has highlighted the importance of immediate and large-scale action to address climate change and the drastic consequence of

inaction[283]. As an Indigenous Nation, Tsleil-Waututh Nation is and will continue to be disproportionately affected by the impacts of climate change.

As described in Tsleil-Waututh Nation's Climate Change Vulnerabilities Report, Tsleil-Waututh Nation will be affected by climate change related sea level rise as well as changes in precipitation, temperature and oceanic changes. These hazards further give rise to coastal flooding and erosion, creek flooding and erosion, over land flooding, coastal squeeze and reduction of intertidal areas, ocean acidification, increased risk of forest fire, and more[284]. Due to the cross-boundary effects of climate change, any impacts of climate change will be felt throughout the entirety of Tsleil-Waututh Nation's territory, not simply in the Project area.

Hazards from climate change are impacting and will continue to impact Tsleil-Waututh Nation community, lands and culture in many ways. Sea level rise and more severe storm events will result in coastal flooding which will impact important infrastructure and cultural sites and increase coastal erosion threatening building, archaeological, and other cultural sites. Ocean acidification from climate change poses an acute threat to species, particularly shellfish. As sea level rises, the intertidal level will shift landward resulting in "coastal squeeze". This will have significant impacts on species that live in the intertidal zone (e.g., shellfish) or that forage for food in these areas (e.g., marine birds and salmon). Many of these species are critically important to Tsleil-Waututh Nation and Tsleil-Waututh Nation cultural health and serve as important opportunities to share traditional teachings.

Waters will become increasingly vulnerable to Harmful Algal Blooms which can severely reduce dissolved oxygen levels and lead to accumulation of toxins, affecting the health of marine plants and animals. Increasing ocean temperatures, changing ocean salinity and reduced amount of oxygen are expected to have significant and broad-reaching impacts on the health of marine life and lead to further impacts on terrestrial species that rely on the ocean as a food source. Climate change also has the potential to make local waters more habitable for invasive and non-native species.

Further hazards from climate change include creek flooding, creek erosion and urban flooding in Tsleil-Waututh Nation territory from increased rainfall resulting in damage to roads, infrastructure and archaeological sites. Anticipated extreme heat waves are expected to cause

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[283] *Global Warming of 1.5oC: IPCC Special Report.*

[284] *Tsleil-Waututh Nation (2019) Understanding Our Community's Climate Change Vulnerabilities Community Climate Change Resilience Planning PHASE 1 Summary. pp. 16-23.*

heat exhaustion or heat stroke, particularly among vulnerable community members. Increased frequency and intensity of wildfires will impact Tsleil-Waututh Nation members' health and opportunities for recreation, cultural practices, and job productivity due to poor air quality and smoke. As air temperatures warm and precipitation patterns change, vector borne diseases are expected to migrate and could affect the health of Tsleil-Waututh Nation members with potential impacts to cultural activities and job productivity[285]*.*

Through a Climate Change Vulnerability Report (TWN 2019), Tsleil-Waututh Nation has already identified areas in which Tsleil-Waututh Nation is expected to be most vulnerable and thus, will be most severely impacted by climate change. These vulnerabilities which may impact Tsleil-Waututh Nation's health and cultural practices include:

- *Beaches and Shorelines: Beach erosion, causing more challenging access to the shoreline by community members;*
- *Social Cultural and Spiritual Well-being: Extreme heat or wildfire events limiting recreation and cultural practices (e.g., Canoe racing);*
- *Forested Areas and Medicinal Plants: Cedar and plant die back from drought, along with an increasing risk of wildfire;*
- *Tsleil-Waututh Nation Community Housing: Possible flood damage during storms, particularly on properties near creek mouths. Increased risk of wildlife impacts;*
- *Roads and Emergency access: Road damage at creek crossings could close roads and slow emergency response times;*
- *Employment and Productivity: Road closures and traffic delays could make it difficult for Tsleil-Waututh Nation members to get to work;*
- *Vulnerable People: Elders and young children are especially vulnerable to heat stress, respiratory illness from wildfire smoke and reduced access to healthy marine foods;*
- *Other cultural and traditional use sites: Damage and challenging access to harvest and other traditional use sites form flooding and erosion. Declining shellfish and salmon populations affecting traditional harvest opportunities and opportunities for knowledge transmission;*
- *Salmon: Declining growth and reproduction rates, along with mortality due to higher water temperatures will affect salmon populations and food source for other species (e.g., SRKW); and*

[285] *Tsleil-Waututh Nation (2019) Understanding Our Community's Climate Change Vulnerabilities Community Climate Change Resilience Planning PHASE 1 Summary. pp. 20-23.*

- *Archaeological sites: Possible damage to sites along the foreshore or creeks from erosion and flooding. Forested areas vulnerable to drought and wildfire.*

The above hazards will result in impacts to Tsleil-Waututh Nation health, Tsleil-Waututh Nation cultural practices and Tsleil-Waututh Nation cultural health.

14.8.6.4.1.1 Severity of Residual Effects -- Impacts on Tsleil-Waututh Nation Cultural Health

Potential TMJ-related residual effects to Tsleil-Waututh Nation's health, cultural practices and cultural health were identified above. From Tsleil-Waututh Nation's perspective, any TMJ-related GHG Emissions will contribute to climate change and will result in impacts on Tsleil-Waututh Nation's cultural practices and health. TJLP has identified some mitigation measures for emissions including BMPs for emissions and leak detection and limiting the number of vessels with crude oil-based fuels. However, the Project does not provide any offsets for emissions during TMJ construction or operation including burning of LNG.

The severity of this residual effect on Tsleil-Waututh Nation's health, cultural practices and cultural health can also be assessed using the methods described above.

- *The duration of the impact would persist through the life of TMJ (up to AD 2053);*
- *This impact would be irreversible due to the long-term impacts that climate change is having on Tsleil-Waututh Nation; and*
- *The cumulative impact of this additional impact on Tsleil-Waututh Nation's health, cultural health compared to an AD 1792 baseline would be significant.*

The severity of these negative impacts on Tsleil-Waututh Nation peoples' health and right to practice culture would be very high.

14.8.7 TSLEIL-WAUTUTH NATION FISHERIES

Continued access to the fisheries of the Lower Fraser River is of significant importance to Tsleil-Waututh Nation in relation to TMJ[286]. Tsleil-Waututh Nation's assertion of their Aboriginal interests in the fisheries of the Fraser River is not new, and Tsleil-Waututh Nation chiefs are signatories on petitions asserting their interests on the Lower Fraser as early as the AD

[286] *Morin, Jesse (2016) Tsleil-Waututh Nation Traditional Use Study Review in Relation to the WesPac Tilbury Marine Jetty Project (14-211). Report prepared for Tsleil-Waututh, Treaty, Lands and Resources Department. Tsleil-Waututh Nation. pp. 12-13, 20, 25-26.*

1860's[286]. The very large historic Coast Salish fishing village – Dl'akti'nes (DgRs-17) - located on the north bank of the South Arm approximately opposite the TMJ area speaks to the richness of the salmon fishery here[287, 280].

Of these fisheries, sockeye is most important, as it is a preferred food species, and by far the single largest source of traditional seafood that is available for harvest by Tsleil-Waututh Nation people anywhere within their territory. Very small numbers of chinook, also a preferred species, are available to Tsleil-Waututh Nation only within the Lower Fraser River area. Tsleil-Waututh Nation's access to salmon extends to include pink, chum and coho (incidental). Alternative sources of sockeye and chinook are not available elsewhere in Tsleil-Waututh Nation territory besides the Lower Fraser River, and approaches to the Fraser River, and these areas are already very constrained by shipping activities and other Indigenous and commercial fishermen.

Tsleil-Waututh Nation currently has allocations for sockeye and chinook on the Lower Fraser River through their FSC fisheries. However, due to low sockeye returns in recent years, Tsleil-Waututh Nation has not been able to obtain this full allocation. This means that in most years, Tsleil-Waututh Nation's food fish distribution to the community is curtailed, and individual community members receive only a few fish each, if any.

Sockeye salmon is very important to Tsleil-Waututh Nation for FSC purposes. First, sockeye is a preferred food and one of the only traditional types seafood available from Tsleil-Waututh Nation territory (the others being pink and chum salmon). From Tsleil-Waututh Nation's perspective, Tsleil-Waututh Nation diets should contain local foods to maintain ones' personal health and to maintain a healthy relationship with the lands and waters of their territory[288]. Tsleil-Waututh Nation has a goal of obtaining 10% of their protein from local sources (ibid) and that goal can only be achieved with a substantial sockeye salmon harvest.

Second, it is a cultural requisite that at all large community social events, and especially at events including guests from other Indigenous, traditional foods are served. Sockeye salmon is

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[287] McHalsie, Albert (Sonny) (2001) Halq'emeylem Place Names in Stó:lō Territory. In A Coast Salish Historical Atlas, edited by Keith Thor Carlson, pp. 134-153. Douglas and McIntyre, Vancouver. pp. 141.

[288] Tsleil-Waututh Nation (2015) Assessment of the Trans Mountain Pipeline and Tanker Expansion Proposal. Tsleil-Waututh Nation, Treaty, Lands and Resources Department. pp. 80-81.

the staple at practically all such Tsleil-Waututh Nation community events[289]. It would be very difficult for Tsleil-Waututh Nation to host larges social events in the culturally appropriate way without a secure sockeye harvest.

Third, Tsleil-Waututh Nation people use sockeye salmon for ritual purposes. More specifically, Tsleil-Waututh Nation ritualists undertake seasonal burnings (involving the burning of food and other goods) to take care of their ancestors and supernatural beings[290, 291, 292]. As described in Morin (2015:390), Tsleil-Waututh Nation ritualists say that the ancestors and supernatural spirits want local traditional foods because these are the foods they know and remember. Part of Tsleil-Waututh Nation's stewardship obligation to their ancestors and local supernatural spirits is to take care of those beings/spirits by ritually sending them local traditional food. Sockeye or chinook salmon have been the focal food at every recent Tsleil-Waututh Nation burning ceremony. Without access to sockeye and chinook salmon from the Fraser River, Tsleil-Waututh Nation ritualists cannot fulfill their religious obligation to take care of their ancestors.

Crab is likely the next most important contemporary source of local traditional food[293]. Tsleil-Waututh Nation obtains the bulk of its FSC crab from the Tsawwassen area. The crab fishery is already very competitive with frequent interactions with larger vessels and tugs resulting in a significant decrease in access and/or decrease in crab harvest.

In addition to FSC licenses, Tsleil-Waututh Nation currently holds Allocation Transfer Program communal commercial fishing licenses in the TMJ area. This includes crab, herring, prawn, sockeye and other salmon gill net licenses. Tsleil-Waututh Nation is also involved in commercial fisheries through Salish Seas Limited Partnership, a business owned jointly with Musqueam Indian Band and Tla'aminNation. Species harvested commercially through this enterprise include halibut, sablefish, prawn, crab, herring, and salmon.

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[289] Morin, Jesse (2015) Tsleil-Waututh Nation's History, Culture and Aboriginal Interests in Eastern Burrard Inlet. Prepared for Gowlings, Lafleur, Henderson LLP. Submitted to the National Energy Board. pp. 364, 389-391.

[290] Kew, Michael (1970) Coast Salish Ceremonial Life: Status and Identity in a Modern Village. Unpublished PhD dissertation, Department of Anthropology, University of Washington, Seattle. Pp. 210-230.

[291] McHalsie, Albert (Sonny) (2007) We Have to Take Care of Everything That Belongs to Us. In Be of Good Mind: Essays on the Coast Salish, edited by B. Miller, pp. 82-130. UBC Press, Vancouver. pp. 119-120.

[292] Morin, Jesse (2015) Tsleil-Waututh Nation's History, Culture and Aboriginal Interests in Eastern Burrard Inlet. Prepared for Gowlings, Lafleur, Henderson LLP. Submitted to the National Energy Board. pp. 364, 389-391.

[293] Tsleil-Waututh Nation (2020) WesPac Tilbury Marine Jetty Project – Marine Shipping and Interactions with TWN Aboriginal Interests (Confidential).

14.8.7.1 IMPACTS TO TSLEIL-WAUTUTH HARVEST AND RIGHT TO FISH

14.8.7.1.1 MOORING OF VESSELS

Tsleil-Waututh Nation TUS records describe recent salmon fishing activities in the South Arm of the Fraser River in the immediate vicinity of TMJ. It is Tsleil-Waututh Nation's perspective that the docking and mooring of vessels at TMJ will physically interfere with Tsleil-Waututh's salmon fisheries there. As described above, the presence of large vessels and associated tugs can and regularly do displace Tsleil-Waututh Nation fishermen operation on the Lower Fraser River. The wakes from these large vessels also interfere with Tsleil-Waututh Nation fishing activities undertaken on small boats. More specifically, the presence of the vessels at the marine jetty will preclude Tsleil-Waututh Nation fishermen from harvesting sockeye and chinook in the TMJ area. As described above, Tsleil-Waututh Nation sockeye openings are very brief, usually a few days, and even very short disruptions of fishing can have a major impact on total harvest.

The mooring of ships from TMJ are expected interfere with Tsleil-Waututh Nation's ability to harvest chum and pink salmon in the project area as well. Unlike sockeye and chinook, alternative sources of chum and pink are available to Tsleil-Waututh Nation at the Indian River[294].

It is important to note that much of the South Arm of the Fraser River is similarly industrialized and heavily trafficked by shipping vessels. Tsleil-Waututh Nation fishermen who are displaced from the TMJ area cannot necessarily replace such a fishing location with another comparable location. The cumulative effects of 150 years of development in this region have greatly reduced the locations where Tsleil-Waututh Nation fishermen can harvest sockeye and chinook on the Lower Fraser River. Further, there is very high demand for Fraser River sockeye from many other First Nations and commercial fishermen.

As noted above, sockeye and chinook salmon are preferred food species for Tsleil-Waututh Nation and are not available elsewhere in Tsleil-Waututh Nation territory beyond the Lower Fraser River and approaches to the Fraser. Again, sockeye is one of the remaining sources of traditional marine food available to Tsleil-Waututh Nation in their territory, and is perhaps the sole remaining preferred traditional marine food that is safe to harvest and consume within Tsleil-Waututh Nation territory.

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[294] *Morin, Jesse (2015) Tsleil-Waututh Nation's History, Culture and Aboriginal Interests in Eastern Burrard Inlet. Prepared for Gowlings, Lafleur, Henderson LLP. Submitted to the National Energy Board. pp. 364, 306-310.*

14.8.7.1.1.1 Severity of Residual Effects -- Impacts on Tsleil-Waututh Nation Fisheries and Right to Fish (Sockeye Fishery)

Potential TMJ related negative impacts to Tsleil-Waututh Nation's sockeye fishery were identified from the mooring of vessels, namely increased vessel interactions and displacement of Tsleil-Waututh Nation fishermen from the TMJ area. The proposed measures included in the assessment[295,296] do not offer any mitigations for increased vessel interactions and harvesting interruptions, or displacement of Indigenous fishermen, and suggests such vessel interactions will only have a negligible effect on Tsleil-Waututh Nation sockeye fishery. In the Bunker Vessel Assessment Report[297], TJLP proposed synchronizing bunker vessel arrivals and departures with existing vessel traffic during FSC openings (subject to minimum vessel separation requirements), to reduce the potential frequency that Indigenous fishers would be required to remove or retract their nets. However, Tsleil-Waututh Nation and other Indigenous groups will have fewer fish openings, less fish available for harvesting and fewer fishing opportunities. TWN is not confident that the proposed mitigations will successfully mitigate impacts on TWN's rights and interests. TJLP will be conditioned to create a Marine Access and Transportation plan including mitigations to relieve disruptions however these mitigations have not been explicit or shown to be effective. Tsleil-Waututh Nation's perspective is that such vessel interactions will definitely interfere with their sockeye fishery.

Given that TJLP has offered no effective mitigations for such vessel interactions, or displacement of Indigenous fishers, the probability of these mitigations being successful can be considered to be nil. Fishing areas will be busier with increased vessel traffic from TMJ-related passing of LNG carriers, bunker vessels, barges and tugs, causing increased stress and competition due to the cumulative effect of access restrictions to key fishing areas. Therefore, it is Tsleil-Waututh Nation's perspective, that the mooring of ships in the TMJ area will result in a residual negative effect on Tsleil-Waututh Nation's current and future sockeye harvesting activities. The severity of this residual effect on Tsleil-Waututh Nation's sockeye harvesting activities can also be assessed using the methods described above.

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[295] *WesPac (2020-4.2) WesPac Tilbury Marine Jetty Project: Marine Shipping Assessment. Section 4.2 Current Use of Land and Resources for Traditional Purposes and Aboriginal and Treaty Rights Assessments. Submitted to BC Environmental Assessment Office by WesPac Midstream-Vancouver LLC. pp. 125.*

[296] *TJLP (2022). Tilbury Marine Jetty: Bunker Vessel Scenario Assessment. Submitted to BC Environmental Assessment Office by Tilbury Jetty Limited Partnership.*

[297] *Ibid.*

- *The duration of individual vessel interactions would be brief, but persistent throughout the life of TMJ (up to AD 2053);*
- *The physical displacement of Indigenous fishermen from the TMJ location would persist through the lifetime of TMJ, but would be reversible (i.e., decommissioning the mooring area); and*
- *The cumulative impacts to Tsleil-Waututh Nation's ability to harvest sockeye compared to an AD 1792 baseline would be significant.*

Based on these three attributes, the significance of the residual effect on Tsleil-Waututh Nation's ability to harvest sockeye is assessed at very high. TMJ's impact of mooring vessels is expected to interfere with Tsleil-Waututh Nation sockeye harvesting activities and to decrease their sockeye harvests.

14.8.7.1.2 TRANSIT OF VESSELS

Tsleil-Waututh Nation fishermen harvest sockeye and chinook from various locations on the Lower Fraser River and approaches to the Fraser River depending on local conditions and fish behaviour. The South Arm of the Fraser River, including the marine portion of the project area, and approaches to the Fraser River are presently and historically have been prime fishing locations.

While Tsleil-Waututh Nation seeks to increase their FSC allocations of sockeye and chinook, they are often not able to even harvest their presently low allocations due to low returns and short, regulated harvesting windows. However, due to low sockeye returns in recent years, Tsleil-Waututh Nation has not been able to obtain this full allocation. Tsleil-Waututh Nation chum and pink salmon harvests are also important in the Lower Fraser River area, including the TMJ area. Tsleil-Waututh Nation also has commercial fishery interests in the marine shipping are. This includes three crab licences off the mouth of the Fraser River, and two commercial salmon licences for the area between the Fraser River and Galiano Island. All of these fishery areas are intersected by TMJ-related marine shipping.

The transit of ships from TMJ are expected interfere with Tsleil-Waututh Nation's ability to harvest chum and pink salmon in the TMJ area. Unlike sockeye and chinook, alternative sources of chum and pink are available to Tsleil-Waututh Nation at the Indian River[294].

While the exact number of vessels docking/loading at the TMJ is expected to vary with market conditions, in the Application scenario, TJLP[254, 255] estimates that up to 68 LNG carriers and 69 LNG bunker vessels could dock at the jetty per year. Of those 69 bunker vessels, a maximum of 50 bunker vessels would transit the marine shipping area. All 68 LNG carriers would transit the marine shipping area. TJLP assumed that there would be three tugs per carrier or bunker vessel.

For the BVS[298], TJLP estimates up to 365 LNG vessel calls per year (on average, one call daily), with a vessel mix of 307 bunker vessels and up to 58 LNG carriers. These ship movements would result in approximately 730 trips inbound and outbound annually. For the BVS, TJLP assumed that no tugs would be required for bunker vessels. However, there will be annual tug-assisted barges loads every year to support maintenance dredging. These ship movements would result in additional vessel movements through the TMJ area per year. In addition, construction will result in additional movements of vessels (barge and a tug) due to dredging.

From Tsleil-Waututh Nation's perspective, the transit of vessels to and from TMJ is expected to interfere with Tsleil-Waututh Nation's ability to harvest sockeye, chinook and crab in the vicinity of the project area and the marine shipping route. Alternative locations are similarly very constrained by shipping activity and intense competition from other Indigenous and commercial fishermen. The fishing areas that vessels will transit are currently used by multiple Indigenous groups for traditional purposes and the exercise of rights, therefore the presence of large vessels and associated tugs can and regularly do further displace Tsleil-Waututh Nation fishermen operation on the Lower Fraser River and the Salish Sea. The wakes from these large vessels also interfere with Tsleil-Waututh Nation fishing activities undertaken on small boats.

Access to current Tsleil-Waututh Nation sockeye fisheries on the Lower Fraser River are already constrained by considerable shipping traffic through this area. The transit of LNG vessels and associated tugs through Tsleil-Waututh Nation's sockeye fishing area would further negatively impact Tsleil-Waututh Nation's ability to harvest sockeye. Although carriers, bunkers and tugs would only briefly be in this fishing area, this area already experiences heavy shipping traffic and Tsleil-Waututh Nation fishermen are already constrained by the passage of large vessels through their primary fishing area during their very brief fish openings. Regulatory restrictions have shortened windows for fishing, which not only limits the amount of fish to be caught but also their personal safety and the time available to practice and transmit traditional fishing knowledge.

For example, in AD 2014 Tsleil-Waututh Nation's sockeye openings were less than six days[299]. During these six days, Tsleil-Waututh Nation fishermen position themselves in advantageous positions on the Fraser River and its approaches to set their nets and to intercept the migratory sockeye to obtain nearly all their community's traditional food. Even relatively brief

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[298] *TJLP (2022). Tilbury Marine Jetty Project: Bunker Vessel Scenario Assessment. Submitted to BC Environmental Assessment Office by Tilbury Jetty Limited Partnership.*

[299] *Fisheries and Oceans Canada (2018) Recovery Strategy for the Northern and Southern Resident Killer Whales (Orcinus orca) in Canada. https://www.sararegistry.gc.ca/virtual_sara/files/plans/Rs- ResidentKillerWhale-v00-2018Aug-Eng.pdf. Accessed May 29, 2020. pp. 4, 11.*

interruptions of these fishing activities caused by the transit of vessels and tugs wherein Tsleil-Waututh Nation fishing vessels need to move or relocate their nets, can result in a considerable decrease in daily catch. Several repeated interruptions of this kind can significantly decrease Tsleil-Waututh Nation's total sockeye landings.

An analogous situation exists for Tsleil-Waututh Nation's commercial and FSC crab fishery off of Tsawwassen. While this crab fishery is less significant to Tsleil-Waututh Nation, it still supplies almost the entire Tsleil-Waututh Nation FSC crab and economic benefit to Tsleil-Waututh Nation through leasing their two commercial licenses. FSC crab are obtained in small vessels usually just once per year. The Tsleil-Waututh Nation FSC crab opening in the Tsawwassen area lasted for only 48 hours in AD 2014[299]. As with sockeye, Tsleil-Waututh Nation is concerned about the interactions between large vessels and tugs travelling through this area and Tsleil-Waututh's small crab fishing boat. Again, when large vessels travel through an area, they displace small fishing vessels, and their large wakes negatively impact crab harvesting activities, by reducing the amount of time spent harvesting over very brief openings.

14.8.7.1.2.1 Severity of Residual Effects -- Impacts on Tsleil-Waututh Nation Fisheries and Right to Fish (Sockeye Fishery)

Potential project related negative impacts to Tsleil-Waututh Nation's sockeye fishery were identified from the transit of vessels, namely increased vessel interactions and disruptions of very narrow harvesting windows. The proposed measures included in the assessment do not offer any concrete mitigations for increased vessel interactions and harvesting interruptions, and suggests such vessel interactions will only have a negligible effect on Tsleil-Waututh Nation sockeye fishery. In the Bunker Vessel Assessment Report[300], TJLP proposed synchronizing bunker vessel arrivals and departures with existing vessel traffic during FSC openings (subject to minimum vessel separation requirements), to reduce the potential frequency that Indigenous fishers would be required to remove or retract their nets. However, the proposed mitigation measures will not address traditional rights-based practices. TWN does hold licenses (e.g., FSC, ATP) but also relies on traditional fishing and harvesting practices that are not under DFO regulatory framework (e.g., cultural protocols, family connections). TJLP will be conditioned to create a Marine Access and Transportation plan including mitigations to relieve disruptions however, these mitigations have not been explicit or shown to be effective. Tsleil-Waututh Nation's perspective is that such vessel interactions will definitely interfere with their sockeye fishery.

[300] *TJLP (2022). Tilbury Marine Jetty: Bunker Vessel Scenario Assessment. Submitted to BC Environmental Assessment Office by Tilbury Jetty Limited Partnership.*

Given that the TJLP (WesPac 2019, 2020) has offered no substantial mitigations for such vessel interactions, the probability of these mitigations being successful can be considered to be nil. It is Tsleil-Waututh Nation's perspective, then, that the increased shipping from TMJ will result in a residual negative effect on Tsleil-Waututh Nation sockeye harvesting activities.

The severity of this residual effect on Tsleil-Waututh Nation's sockeye harvesting activities can also be assessed using the methods described above.

- *The duration of individual vessel interactions would be brief, but persistent throughout the life of the project (up to AD 2053);*
- *The impact of interactions would be reversible (i.e., cessation of shipping traffic) though the impacts could be permanent due to the conservation status of the species; and*
- *The cumulative impacts to Tsleil-Waututh Nation's ability to harvest sockeye compared to an AD 1792 baseline would be significant*[301].

Based on these three attributes, the significance of the residual effect on Tsleil-Waututh Nation's ability to harvest sockeye is assessed at very high. TMJ-related vessel traffic is expected to interfere with Tsleil-Waututh Nation's sockeye harvesting activities and to decrease their sockeye harvests and no concrete or effective mitigations are offered.

14.8.7.1.2.2 Severity of Residual Effects – Impacts on Tsleil-Waututh Nation Fisheries and Right to Fish (Crab Fishery)

Potential TMJ-related negative impacts to Tsleil-Waututh Nation's crab fishery were identified from the transit of vessels, namely increased vessel interactions and disruptions of very narrow harvesting windows. The proposed measures included in the assessment do not offer any mitigations for increased vessel interactions and harvesting interruptions, and suggests such vessel interactions will only have a negligible effect on Tsleil-Waututh Nation crab fishery. TJLP will be conditioned to create a Marine Access and Transportation plan including mitigations to relieve disruptions however, these mitigations have not been explicit nor have been shown to be effective. Tsleil-Waututh Nation's perspective is that such vessel interactions will definitely interfere with their crab fishery and the economic value of their crab licenses.

[301] Early historic and pre-contact Fraser River sockeye returns have been estimated as about 100 million in a big year (every fourth year) and 20 million in the intervening three off-years (Ricker 1987:i, 5-7), and recent sockeye returns are about 85% lower than this. In pre-contact times Tsleil-Waututh Nation people harvested the quantity of sockeye required by their communities according to Coast Salish laws and protocols. The cumulative effects of progressively fewer harvestable sockeye and progressively restrictive fisheries regulations since AD 1792 have already been significant to Tsleil-Waututh Nation's ability to harvest sockeye.

Given that the Proponent has offered no strong mitigations for such vessel interactions, the probability of these mitigations being successful can be considered to be nil. It is Tsleil-Waututh Nation's perspective, then, that the increased shipping from TMJ will result in a residual negative effect on Tsleil-Waututh Nation's crab harvesting activities and the commercial value of their crab leases.

The severity of this residual effect on Tsleil-Waututh Nation's crab harvesting activities can also be assessed using the methods described above.

- *The duration of individual vessel interactions would be brief, but persistent throughout the life of TMJ (up to AD 2053);*
- *The impact of interactions would be reversible (i.e., cessation of shipping traffic); and*
- *The cumulative impacts to Tsleil-Waututh Nation's ability to harvest crab compared to an AD 1792 baseline would be significant.*

Based on these three attributes, the significance of the residual effect on Tsleil-Waututh Nation's ability to harvest crab is assessed at very high. TMJ-related vessel traffic is expected to interfere with Tsleil-Waututh Nation's crab harvesting activities, decrease their crab harvests and the value of crab licences, and no effective mitigations are offered.

14.8.7.1.3 ACCIDENTS AND MALFUNCTIONS

Accidental spills, emissions, or explosions have a low probability of occurring, but carry very significant potential negative effects to salmonids and other fish migrating through the TMJ area as well as negative effects to fish habitat. Such accidents would, of course, vary in magnitude, and smaller accidents would have a much higher probability of occurring than large catastrophic accidents. If spills or accidents occurred during a time when spawning salmon were ascending the Fraser River, or when juvenile salmon were descending it and were to harm the fish, even relatively small spills or accidents could decrease the quantity of returning salmon that would be available for harvest four years later and have a severely negative effect on Tsleil-Waututh Nation's ability to harvest salmonids. Furthermore, larger spills could affect water quality and important fish habitat, resulting in negative impacts on crab and salmon populations. Relatively large spills or accidents at important migration and breeding times or in important fish habitat would have catastrophic negative effects on Tsleil-Waututh Nation's ability to harvest salmonids, crab and other traditional foods by both killing large numbers of migrating salmon and destroying and/or preventing Tsleil-Waututh Nation fishermen from operating in the area of the spill. Reductions in populations from a spill would also impact Tsleil-Waututh Nation's experience of fishing even after a spill has been cleaned up due to residual pollution of the area (Changes to experience are discussed further below).

14.8.7.1.3.1 Severity of Residual Effects -- Impacts on Tsleil-Waututh Nation Fisheries and Right to Fish

If a spill or major accident were to occur involving an LNG vessel or supporting tug, it is expected that this would negatively affect salmon and other fish, crab and wildlife populations in the vicinity of the accident location, and thus also negatively affect Tsleil-Waututh Nation fisheries. Estimating the severity of residual effects impacts of an accidental spill depends entirely on the timing, location and extent of the accidental spill.

The severity of this residual effect (accidental spills) on Tsleil-Waututh Nation's sockeye, chinook and crab fisheries can also be assessed using the methods described above.

- *The probability of a small localized spill killing fish and crab is relatively high, while the probability of a catastrophic spill killing fish and crab over a wider area is probably very low;*
- *The duration of the impact (a spill killing fish or crab) would be of short duration (days or weeks);*
- *Depending on the extent and impacts of a spill, the impacts of a spill could be reversible, with large spills not being reversible; and*
- *The cumulative impacts to Tsleil-Waututh Nation's ability to harvest sockeye, chinook, crab and other species compared to an AD 1792 baseline would range from low to extreme, depending on the scope and timing of an accidental spill.*

Because of the extreme variation of potential scope of spills and accidents, ranging from moderate probability to low probability, the severity of negative impacts to Tsleil-Waututh Nation's ability to harvest salmonids and crab is assessed to be low to extreme.

14.8.7.1.4 DESTRUCTION OF FISH HABITAT

In addition to the potential direct impacts to Tsleil-Waututh Nation's sockeye/chinook fishery resulting from TMJ-related activities described above, TMJ activities are anticipated to have negative effects on preferred food fish (e.g., sockeye, chinook, sturgeon and eulachon) habitat and hence food fish populations. TMJ activities including dredging, construction and TMJ infrastructure have the potential to negatively affect habitat for juvenile sockeye and chinook salmon, sturgeon and eulachon, all preferred food species for Tsleil-Waututh Nation[264, 232]. Any net decrease in habitat for these species will very likely reduce each species' population, and hence further decrease their availability for Tsleil-Waututh Nation harvest.

In addition to the salmonids described above, Tsleil-Waututh Nation also traditionally partook in eulachon and sturgeon fisheries on the Lower Fraser River[302, 303]. Over recent decades, Tsleil-Waututh Nation people have not been able to harvest these species due to their very low population numbers and protected status[250]. Eulachon and sturgeon are preferred foods that Tsleil-Waututh Nation seeks to increase their access to. As with sockeye and chinook salmon, there are no alternative sources of eulachon and sturgeon within Tsleil-Waututh Nation territory besides the Lower Fraser River area.

If eulachon and sturgeon populations increased to levels allowing a sustainable harvest, then Tsleil-Waututh Nation people would harvest them in the South Arm of the Fraser River. Further reduction of eulachon and sturgeon habitat will not aid Tsleil-Waututh Nation in achieving their goal of obtaining a sustainable harvest of sturgeon and eulachon. As described above, Tsleil-Waututh Nation are not able to obtain their modest allocation of sockeye and chinook. TMJ activities resulting in a reduction of fish habitat will reduce salmon populations, and reduce the salmon available for Tsleil-Waututh Nation harvest. Low availability of preferred foods increases competition and forces Tsleil-Waututh Nation fisherman to change fishing practices to rely more strongly on Nation to Nation agreements, eroding self-governance and Tsleil-Waututh Nation's ability to secure their food sovereignty (See Section 14.8.9).

14.8.7.1.4.1 Severity of Residual Effects -- Impacts on Tsleil-Waututh Nation Fisheries and Right to Fish (Salmonids, Eulachon and Sturgeon)

Potential TMJ-related negative impacts to Tsleil-Waututh Nation's sockeye and chinook fishery, and Tsleil-Waututh Nation's aspired eulachon and sturgeon fisheries were identified from destruction of fish habitat associated with TMJ-related activities including dredging, construction and TMJ infrastructure. While mitigations are offered to offset the loss of fish habitat[230, 232], it is Tsleil-Waututh Nation's opinion that there is a low probability that the proposed mitigations would result in no net loss of fish habitat, and a much higher probability that the proposed mitigations will result in a net loss of fish habitat. It is Tsleil-Waututh

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[302] *Morin, Jesse (2015) Tsleil-Waututh Nation's History, Culture and Aboriginal Interests in Eastern Burrard Inlet. Prepared for Gowlings, Lafleur, Henderson LLP. Submitted to the National Energy Board. pp. 171, 195, 211-216, 289-299.*

[303] *Morin, Jesse (2016) Tsleil-Waututh Nation Traditional Use Study Review in Relation to the WesPac Tilbury Marine Jetty Project (14-211). Report prepared for Tsleil-Waututh, Treaty, Lands and Resources Department. Tsleil-Waututh Nation. pp. 21.*

Nation's opinion that there will be a residual effect to fish habitat from TMJ-related construction activities.

The severity of this residual effect on Tsleil-Waututh Nation's sockeye and chinook fisheries and Tsleil-Waututh Nation's aspired eulachon and sturgeon fisheries can also be assessed using the methods described above.

- *The duration of the impact (habitat loss) would be permanent due to habitat loss from infrastructure;*
- *Habitat loss could be irreversible due to the placement of TMJ infrastructure and no plan to fully recommission the site for no future development; and*
- *The cumulative impacts to Tsleil-Waututh Nation's ability to harvest sockeye, chinook, eulachon, and sturgeon compared to an AD 1792 baseline would be significant.*

Given the context of extensive cumulative effects of habitat loss and degradation around the South Arm of the Fraser River and the Fraser estuary in general, additional habitat loss is anticipated as negatively affecting Tsleil-Waututh Nation's ability to harvest salmonids (especially sockeye and chinook), and precluding future Tsleil-Waututh Nation harvest of sturgeon and eulachon. The severity of this negative impact to Tsleil-Waututh Nation's ability to harvest salmonids, sturgeon and eulachon is assessed at very high.

14.8.7.1.5 CLIMATE CHANGE AND IMPACTS ON TSLEIL-WAUTUTH NATION FISHERIES AND RIGHT TO FISH

TMJ is anticipated to emit GHGs throughout all project phases. Emissions include CO_2, methane and nitrous oxide. Tsleil-Waututh Nation raised numerous concerns throughout the EA regarding the inadequacy of the GHG assessment and the Upstream GHG assessment. The scope did not include all potential downstream and upstream effects (including indirect emissions) resulting in a faulty assessment. In addition, the No Project Case for the Upstream GHG Assessment relied on the conclusion that TMJ did not consist of a new source of LNG. Tsleil-Waututh Nation raised concerns regarding this conclusion, with the feasibility of the No Project Case and with the link between TMJ and the FortisBC Phase 2 Expansion Project (as described above).

Climate change has the potential to profoundly impact Tsleil-Waututh Nation and many aspects of community life including Tsleil-Waututh Nation's fisheries. The IPCC has highlighted the importance of immediate and large-scale action to address climate change and the drastic consequence of inaction[283]. As an Indigenous Nation, Tsleil-Waututh Nation is and will continue to be disproportionately affected by the impacts of climate change.

As described in Tsleil-Waututh Nation's Climate Change Vulnerabilities Report, Tsleil-Waututh Nation will be affected by climate change related sea level rise as well as changes in precipitation, temperature and oceanic changes. These hazards further give rise to coastal flooding and erosion, creek flooding and erosion and over land flooding, coastal squeeze and reduction of intertidal areas, ocean acidification, increased risk of forest fire, and more[284]. Due to the cross-boundary effects of climate change, any impacts of climate change will be felt throughout the entirety of Tsleil-Waututh Nation's territory, not simply in the TMJ area.

Hazards from climate change are impacting and will continue to impact Tsleil-Waututh Nation community, lands and culture in many ways. Ocean acidification from climate change poses an acute threat to species (particularly shellfish). As sea level rises, the intertidal level will shift landward resulting in "coastal squeeze". This will have significant impacts on species that live in the intertidal zone (e.g., shellfish) or that forage for food in these areas (e.g., marine birds and salmon). Waters will become increasingly vulnerable to Harmful Algal Blooms which can severely reduce dissolved oxygen levels and lead to accumulation of toxins, affecting the health of marine plants and animals. Increasing ocean temperatures, changing ocean salinity and reduced amount of oxygen are expected to have significant and broad-reaching impacts on the health of marine life and lead to further impacts on terrestrial species that rely on the ocean as a food source. Climate change also has the potential to make local waters more habitable for invasive and non-native species[304].

Through a Climate Change Vulnerability Report, Tsleil-Waututh Nation has already identified areas in which Tsleil-Waututh Nation is expected to be most vulnerable and thus, will be most severely impacted by climate change. These vulnerabilities include:

- *Salmon: Declining growth and reproduction rates, along with mortality due to higher water temperatures will affect salmon populations and food source for other species (ex. SRKW);*
- *Shellfish: Loss of habitat from coastal squeeze, paired with shell formation issues and declining growth and reproduction rates will affect shellfish health and food source for other species; and*
- *Forage Fish (e.g., Herring, Eulachon): Declining growth and reproduction rates due to changing ocean conditions and coastal squeeze affecting spawning and rearing habitat. This will in turn affect food sources for other species.*

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[304] *Tsleil-Waututh Nation (2019) Understanding Our Community's Climate Change Vulnerabilities Community Climate Change Resilience Planning PHASE 1 Summary*

The above impacts will result in reduced access to Tsleil-Waututh Nation fisheries and healthy marine foods.

14.8.7.1.5.1 Severity of Residual Effects -- Impacts on Tsleil-Waututh Nation Fisheries and Right to Fish

Potential TMJ-related residual effects to Tsleil-Waututh Nation's fisheries were identified above. From Tsleil-Waututh Nation's perspective, any TMJ-related GHGs will contribute to climate change and will result in impacts on Tsleil-Waututh Nation's Fisheries. TMJ has identified some mitigation measures for emissions including BMPs for emissions and leak detection, and limiting the number of vessels with crude oil-based fuels. However, TMJ does not provide any offsets for emissions during TMJ construction or operation including burning of LNG.

The severity of this residual effect on Tsleil-Waututh Nation's fisheries can also be assessed using the methods described above.

- *The duration of the impact would persist through the life of TMJ (up to AD 2053);*
- *This impact would be irreversible due to the long term impacts that climate change is having on fish and fish habitat; and*
- *The cumulative impact of this additional impact on Tsleil-Waututh Nation's ability to fish compared to an AD 1792 baseline would be significant.*

The severity of these negative impacts on Tsleil-Waututh Nation peoples' right to fish would be very high.

14.8.7.1.6 IMPACTS TO TSLEIL-WAUTUTH NATION'S EXPERIENCE OF FISHING

Beyond all of the physical impacts to fish, fish habitat, crab and Tsleil-Waututh Nation's ability to harvest fish and crab, TMJ will negatively affect Tsleil-Waututh Nation peoples' experience in fishing, including cultural sharing and cultural transmission. This cultural sharing and transmission includes the sharing of TEK, family histories, personal experiences, oral histories, in addition to current fishery practices. More specifically, the increased noise and air pollution originating from increased vessel traffic, and the physical presence of large vessels will alter the experiential aspects of Tsleil-Waututh Nation fishermen in the project area and shipping route. Even if the noise and air pollution remain below acceptable regulated thresholds[305], Tsleil-

[305] *WesPac (2020) WesPac Tilbury Marine Jetty Project. Appendix 5: Draft Mitigations Under CEAA 2012 for WesPac Tilbury Marine Jetty Project.*

Waututh Nation fishermen in the project area and shipping route are likely to perceive it as being noisier and more polluted. Fishing areas will be busier with increased vessel traffic from TMJ-related passing of LNG carriers, bunker vessels, barges and tugs causing increased stress and competition due to the cumulative effect of access restrictions to key fishing areas.

The Lower Fraser River is not a pristine environment, but rather a heavily modified landscape dotted with jetties, factories, sewage treatment facilities and so forth, and is heavily trafficked by vessels and barges. The cumulative effects of the air and noise pollution accrued to the TMJ area, the steady shipping traffic through the project area, are all contributing to making the experience of being on the Lower Fraser River increasingly unpleasant for Tsleil-Waututh Nation fishermen (i.e., decreasing the quality of the experience). These factors are likely to dissuade Tsleil-Waututh Nation fishermen from harvesting salmon and crab in areas that may be technically clean and safe enough to harvest from. These factors are also likely to dissuade young Tsleil-Waututh Nation people from participating in the sockeye and crab fisheries within the project area. This reduction in participation in fishing activities decreases cultural sharing and transmission. Conversely, from Tsleil-Waututh Nation's perspective, expanding community members' levels of participation in traditional food harvesting activities is a key priority.

14.8.7.1.6.1 Severity of Residual Effects -- Impacts on Tsleil-Waututh Nation's Experience of Fishing

Potential TMJ-related residual effects to Tsleil-Waututh Nation's experience of fishing were identified above. From Tsleil-Waututh Nation's perspective, even if noise and air pollution are kept under mandated levels, Tsleil-Waututh Nation fishermen will still perceive the area as nosier and more polluted. Fishing areas will be busier with increased vessel traffic from TMJ-related passing of LNG carriers, bunker vessels, barges and tugs causing increased stress and competition due to the cumulative effect of access restrictions to key fishing areas.

The severity of this residual effect on Tsleil-Waututh Nation's experience while fishing can also be assessed using the methods described above.

- *The duration of the impact (negative experience while fishing) would persist through the life of TMJ (up to AD 2053) and potentially permanent due to habitat destruction by TMJ-infrastructure;*
- *This impact would be reversible, following a cessation of project shipping (after AD 2053), but only after 30 years of negative impact and potentially permanent due to habitat destruction by TMJ-infrastructure; and*
- *The cumulative impact of this additional impact on Tsleil-Waututh Nation's experience while fishing compared to an AD 1792 baseline would be significant.*

The severity of these negative impacts on Tsleil-Waututh Nation peoples' experience fishing on the Lower Fraser is assessed to be very high.

14.8.8 TSLEIL-WAUTUTH NATION HUNTING, TRAPPING AND GATHERING RIGHTS

14.8.8.1 IMPACTS TO TSLEIL-WAUTUTH NATION'S HARVEST AND RIGHT TO HUNT, TRAP AND GATHER

14.8.8.1.1 MOORING OF VESSELS

Tsleil-Waututh Nation has previously reported that the Lower Fraser River area holds substantial meaning and significance to them. The original TUS[306] summarizes traditional Tsleil-Waututh Nation harvesting of plants, birds, and especially fish within the study area. It also describes temporary settlements, cultural places and traditional travel routes identified in the study area. This section will focus on waterfowl harvesting activities as it illustrates how TMJ and the associated vessel traffic could displace Tsleil-Waututh Nation hunters from the area and impact their harvesting opportunities and their right to hunt, trap and gather.

Tsleil-Waututh Nation TUS records describe recent waterfowl hunting activities in the South Arm of the Fraser River in the immediate vicinity of TMJ. It is Tsleil-Waututh Nation's perspective that the docking and mooring of vessels at TMJ will physically interfere with Tsleil-Waututh Nation's practice of harvesting waterfowl there. As described above, the presence of large vessels and associated tugs can and regularly do displace Tsleil-Waututh Nation fishermen operation on the Lower Fraser River, and this also holds for hunters in small boats harvesting waterfowl. More specifically, the presence of the vessels at the marine jetty, and any localized exclusion zone will preclude Tsleil-Waututh Nation hunters from harvesting waterfowl in the project area. It is also expected that the increase in GHGs and associated climate change will increase the water temperature of the Fraser River, decrease the abundance of small prey fish, resulting in the decrease in waterfowl abundance, ultimately reducing Tsleil-Waututh Nation peoples' ability to harvest waterfowl in this area.

[306] Morin, Jesse (2016) Tsleil-Waututh Nation Traditional Use Study Review in Relation to the WesPac Tilbury Marine Jetty Project (14-211). Report prepared for Tsleil-Waututh, Treaty, Lands and Resources Department. Tsleil-Waututh Nation. pp. 21.

14.8.8.1.1.1 Severity of Residual Effects -- Impacts to Tsleil-Waututh Nation's Right to Harvest Waterfowl

Potential TMJ-related negative impacts to Tsleil-Waututh Nation's practice of hunting waterfowl were identified from the mooring of vessels, namely increased vessel interactions and displacement of Tsleil-Waututh Nation hunters from the TMJ area. The proposed measures included in the assessment[307] do not offer any mitigations for increased vessel interactions and harvesting interruptions, or displacement of Indigenous hunters, and suggests such vessel interactions will only have a negligible effect on Tsleil-Waututh Nation's waterfowl hunting practices. TJLP will be conditioned to create a Marine Access and Transportation plan including mitigations to relieve disruptions however, these mitigations have not been explicit or shown to be effective. Tsleil-Waututh Nation's perspective is that such vessel interactions will definitely interfere with their waterfowl hunting practices.

Given that the plans and conditions proposed by the EAO and the Agency offered no effective mitigations for such vessel interactions, or displacement of Indigenous hunters, the probability of these mitigations being successful can be considered to be nil. It is Tsleil-Waututh Nation's perspective, then, that the mooring of ships in the TMJ area will result in a residual negative effect on Tsleil-Waututh Nation's current and future waterfowl harvesting activities. The severity of this residual effect on Tsleil-Waututh Nation's waterfowl harvesting activities can also be assessed using the methods described above.

- *The duration of individual vessel interactions would be brief, but persistent throughout the life of TMJ (up to AD 2053);*
- *The physical displacement of Indigenous hunters from the TMJ location would persist through the lifetime of TMJ, but would be reversible (i.e., decommissioning the mooring area); and*
- *The cumulative impacts to Tsleil-Waututh Nation's ability to harvest waterfowl compared to an AD 1792 baseline would be significant.*

Based on these three attributes, the significance of the residual effect on Tsleil-Waututh Nation's ability to harvest waterfowl is assessed at very high. The project impact, mooring vessels, is expected to interfere with Tsleil-Waututh Nation's waterfowl harvesting activities and to decrease their waterfowl harvests.

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[307] WesPac (2019 – 4.2) WesPac Tilbury Marine Jetty Project: Environmental Assessment Certificate Application. Section 4.2: Fish and Fish Habitat. Submitted to BC Environmental Assessment Office by WesPac Midstream – Vancouver LLC. pp. 125.

14.8.8.1.2 TRANSIT OF VESSELS

Tsleil-Waututh Nation hunters harvest waterfowl from various locations on the Lower Fraser River. While Tsleil-Waututh Nation seeks to increase their harvest of waterfowl, they are increasingly displaced from traditional waterfowl harvesting areas from expanding development and shipping.

The transit of ships from TMJ are expected to interfere with Tsleil-Waututh Nation's ability to harvest waterfowl in the project area. While the exact number of vessels docking/loading at TMJ is expected to vary with market conditions, TJLP[254, 308,] estimates that up to 68 LNG carriers and 69 LNG bunker vessels could dock at the jetty per year in the Application scenario. Of those 69 bunker vessels, a maximum of 50 bunker vessels would transit the marine shipping area. All 68 LNG carriers would transit the marine shipping area. TJLP assumed that there would be three tugs per carrier or bunker vessel. For the BVS[309] , TJLP estimates up to 365 LNG vessel calls per year (on average, one call daily), with a vessel mix of 307 bunker vessels and up to 58 LNG carriers. These ship movements would result in approximately 730 trips inbound and outbound annually. For the BVS, TJLP assumed that no tugs would be required for bunker vessels. In addition, there will be annual tug-assisted barge loads every year to support maintenance dredging. These ship movements would result in additional vessel movements through the TMJ area per year. In addition, construction will result in an additional movement of vessels (barge and a tug) due to dredging.

From Tsleil-Waututh Nation's perspective, the transit of vessels to and from TMJ is expected to interfere with Tsleil-Waututh Nation's ability to harvest waterfowl in the vicinity of the TMJ area and the marine shipping route. Alternative locations are similarly very constrained by shipping activity and intense competition from other Indigenous hunters. The hunting areas that vessels will transit are currently used by multiple Indigenous groups for traditional purposes and the exercise of rights, therefore the presence of large vessels and associated tugs can and regularly do further displace Tsleil-Waututh Nation hunters' operation on the Lower Fraser River. The wakes from these large vessels also interfere with Tsleil-Waututh Nation waterfowl hunting activities undertaken on small boats.

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[308] *WesPac (2019-1.0) WesPac Tilbury Marine Jetty Project: Environmental Assessment Certificate Application. Submitted to BC Environmental Assessment Office by WesPac Midstream – Vancouver LLC. Section 1.0.*

[309] Tilbury Jetty Limited Partnership (2022). Tilbury Marine Jetty Project: Bunker Vessel Scenario/ Submitted to BC Environmental Assessment Office by Tilbury Jetty Limited Partnership.

Access to current Tsleil-Waututh Nation waterfowl hunting areas on the Lower Fraser River are already constrained by considerable shipping traffic through this area. The transit of LNG vessels and associated tugs through Tsleil-Waututh Nation's waterfowl harvesting area here would further negatively impact Tsleil-Waututh Nation's ability to harvest waterfowl. Although freighters and tugs would only briefly be in this fishing area, this area already experiences heavy shipping traffic and Tsleil-Waututh Nation hunters are already constrained by the passage of large vessels through this hunting area.

14.8.8.1.2.1 Severity of Residual Effects – Impacts to Tsleil-Waututh Nation's Right to Harvest Waterfowl

Potential TMJ-related negative impacts to Tsleil-Waututh Nation's waterfowl were identified from the transit of vessels, namely increased vessel interactions and disruptions of narrow harvesting windows. The Project Assessment[307] does not offer any concrete or effective mitigations for increased vessel interactions and harvesting interruptions, and suggests such vessel interactions will only have a negligible effect on Tsleil-Waututh Nation's waterfowl harvest.

TJLP will be conditioned to create a Marine Access and Transportation plan including mitigations to relieve disruptions however, these mitigations have not been explicit or shown to be effective. Tsleil-Waututh Nation's perspective is that such vessel interactions will definitely interfere with their waterfowl harvesting activities.

Given that the measures and plans have offered no substantial mitigations for such vessel interactions, the probability of these mitigations being successful can be considered to be nil. It is Tsleil-Waututh Nation's perspective, then, that the increased shipping from TMJ will result in a residual negative effect on Tsleil-Waututh Nation waterfowl harvesting activities.

The severity of this residual effect on Tsleil-Waututh Nation's waterfowl harvesting activities can also be assessed using the methods described above.

- *The duration of individual vessel interactions would be brief, but persistent throughout the life of TMJ (up to AD 2053);*
- *The impact of interactions would be reversible (i.e., cessation of shipping traffic) though the impacts could be permanent due to the conservation status of the species; and*
- *The cumulative impacts to Tsleil-Waututh Nation's ability to harvest waterfowl compared to an AD 1792 baseline would be significant.*

Based on these three attributes, the significance of the residual effect on Tsleil-Waututh Nation's ability to harvest waterfowl is assessed at very high.

TMJ-related vessel traffic is expected to interfere with Tsleil-Waututh Nation's waterfowl harvesting activities and to decrease their waterfowl harvests and no concrete mitigations are offered.

14.8.8.1.3 CLIMATE CHANGE AND IMPACTS ON TSLEIL-WAUTUTH NATION'S WATERFOWL HARVESTING ACTIVITIES

TMJ is anticipated to emit GHGs throughout all project phases. Emissions include CO_2, methane and nitrous oxide. Tsleil-Waututh Nation raised numerous concerns throughout the EA regarding the inadequacy of the GHG assessment and the Upstream GHG assessment. The scope did not include all potential downstream and upstream effects (including indirect emissions) resulting in a faulty assessment. In addition, the No Project Case for the Upstream GHG Assessment relied on the conclusion that TMJ did not consist of a new source of LNG. Tsleil-Waututh Nation raised concerns regarding this conclusion, with the feasibility of the No Project Case and with the link between TMJ and the FortisBC Phase 2 Expansion Project (as described above).

Climate change has the potential to profoundly impact Tsleil-Waututh Nation and many aspects of community life including Tsleil-Waututh Nation's waterfowl harvest. The IPCC has highlighted the importance of immediate and large-scale action to address climate change and the drastic consequence of inaction[283]. As an Indigenous Nation, Tsleil-Waututh Nation is and will continue to be disproportionately affected by the impacts of climate change.

As described in TWN's Climate Change Vulnerabilities Report, Tsleil-Waututh Nation will be affected by climate change related sea level rise as well as changes in precipitation, temperature and oceanic changes. These hazards further give rise to coastal flooding and erosion, creek flooding and erosion and over land flooding, coastal squeeze and reduction of intertidal areas, ocean acidification, increased risk of forest fire, and more[284]. Due to the cross-boundary effects of climate change, any impacts of climate change will be felt throughout the entirety of Tsleil-Waututh Nation's territory, not simply in the TMJ area.

Hazards from climate change are impacting and will continue to impact Tsleil-Waututh Nation community, lands and culture in many ways. Ocean acidification from climate change poses an acute threat to species (particularly shellfish). As sea level rises, the intertidal level will shift landward resulting in "coastal squeeze". This will have significant impacts on species that live in the intertidal zone (e.g., shellfish) or that forage for food in these areas (e.g., marine birds and salmon). Waters will become increasingly vulnerable to Harmful Algal Blooms which can severely reduce dissolved oxygen levels and lead to accumulation of toxins, affecting the health of marine plants and animals. Increasing ocean temperatures, changing ocean salinity and

reduced amount of oxygen are expected to have significant and broad-reaching impacts on the health of marine life and lead to further impacts on terrestrial species that rely on the ocean as a food source. Climate change also has the potential to make local waters more habitable for invasive and non-native species[304].

Through a Climate Change Vulnerability Report, Tsleil-Waututh Nation has already identified areas in which Tsleil-Waututh Nation is expected to be most vulnerable and thus, will be most severely impacted by climate Change. These vulnerabilities include:

- *Salmon: Declining growth and reproduction rates, along with mortality due to higher water temperatures will affect salmon populations and food source for other species (e.g., SRKW);*
- *Shellfish: Loss of habitat from coastal squeeze, paired with shell formation issues and declining growth and reproduction rates will affect shellfish health and food source for other species; and*
- *Forage Fish (e.g., Herring, Eulachon): Declining growth and reproduction rates due to changing ocean conditions and coastal squeeze affecting spawning and rearing habitat. This will in turn affect food sources for other species.*

The impacts to forage fish identified above will result in decreased waterfowl populations, and decrease Tsleil-Waututh Nation access to waterfowl.

14.8.8.1.3.1 Severity of Residual Effects – Impacts to Tsleil-Waututh Nation's Right to Harvest Waterfowl

Potential TMJ-related residual effects to Tsleil-Waututh Nation's waterfowl harvesting activities were identified above. From Tsleil-Waututh Nation's perspective, any TMJ-related GHGs will contribute to climate change and will result in impacts on Tsleil-Waututh Nation's waterfowl harvesting activities. TMJ has identified some mitigation measures for emissions including BMPs for emissions and leak detection, and limiting the number of vessels with crude oil-based fuels. However, TMJ does not provide any offsets for emissions during TMJ construction or operation including burning of LNG.

The severity of this residual effect on Tsleil-Waututh Nation's waterfowl harvest can also be assessed using the methods described above.

- *The duration of the impact would persist through the life of TMJ (up to AD 2053);*
- *This impact would be irreversible due to the long term impacts that climate change is having on waterfowl; and*
- *The cumulative impact of this additional impact on Tsleil-Waututh Nation's ability to harvest waterfowl compared to an AD 1792 baseline would be significant.*

The severity of these negative impacts on Tsleil-Waututh Nation peoples' right to harvest waterfowl would be very high.

14.8.9 IMPACTS TO TSLEIL-WAUTUTH SELF-GOVERNANCE, FOOD SOVEREGNITY AND STEWARDSHIP RESPONSIBILITIES

Tsleil-Waututh Nation's culture and heritage is built on a strong connection with, and a deep obligation to be the caretakers and protectors of their traditional lands and waters. Coastal resources continue to be vitally important, not only for staple foods but also for cultural and spiritual practices, artistic representation, recreation, and technological and economic development. The ability to access and sustainably manage these resources is directly linked to their cultural health and provides important opportunities to pass on cultural teachings and the hən̓q̓əmin̓əm language to the next generation.

As described in Tsleil-Waututh Nation's TMJ – Marine Shipping and Interactions with TWN Aboriginal Interests Report (2020), hunting, gathering, fishing, and cultural activities continue to be practiced by Tsleil-Waututh Nation community members. Marine bird hunting, crabbing and salmon harvesting areas are located in close proximity to the marine shipping route from the Fraser River to the Pacific Ocean. Although these areas may not be always actively used in the present for traditional harvesting purposes due to intense industrialization, displacement and exclusion, they remain of significant cultural and spiritual value. Tsleil-Waututh Nation has expressed their desire to regain access and continue these traditional practices.

Tsleil-Waututh Nation current and desired fisheries practices and uses expand well beyond what is accessed through Crown regulations. In addition to communal licences issued by DFO, Tsleil-Waututh Nation report that they may access food fish through other means, such as through cultural protocols and kinship ties with neighbouring communities, when DFO communal licences are unavailable to Tsleil-Waututh Nation. These practices are key for Coast Salish people as they ensure cultural and nutritional health and overall well-being of these communities. This viewpoint considers access to salmon and crab as an inalienable right, limited only by the natural abundance of salmon and crab themselves and relationships with other First Nations.

Conventional approaches to assess 'Current use of lands for traditional purposes' tend to rely on physical evidence in specific areas, and locations that have no evidence or that are not identified or revealed to outsiders due to Indigenous cultural laws may never register through the EA methodology. In Tsleil-Waututh Nation's holistic view, current use should not be represented as a snapshot in time – Tsleil-Waututh Nation inherit the right to be out on the

land, to hunt, trap and fish, and practice their culture, regardless of the evidence of use. From Tsleil-Waututh Nation's perspective, their access to salmon and other traditional foods is determined by Tsleil-Waututh Nation's inherent right to self-governance and self-determination. When Tsleil-Waututh Nation looks at their fisheries, there are other things considered such as habitat, broader conservation concerns, long term impacts of climate change and shifting food webs, access for current and future generations, and planning. Through cultural connections and beliefs of Tsleil-Waututh Nation, the fisheries are considered a way of life for Tsleil-Waututh Nation members for future generations.

Tsleil-Waututh Nation's right of self-governance includes stewardship responsibilities to the resources of their territory and their ability to secure food sovereignty. This includes the responsibility to ensure that Tsleil-Waututh Nation people have access to traditional sources of food, and a responsibility to ensure that the resources, such as salmon and crab, are available in quantities for future generations.

Several aspects TMJ have been identified as having a residual impact on Tsleil-Waututh Nation fisheries (see above). Any actions by outside parties that limit or preclude Tsleil-Waututh Nation access to salmon, crab, eulachon or sturgeon undermines and erodes these traditional rights of self-governance. Lack of control over how land and waterways are being used, environmental pollutants that contaminate food and food sources, climate change, and overfishing are increasingly reducing the availability of traditional foods. Consequently, any TMJ-related impacts to Tsleil-Waututh Nation fisheries will impact Tsleil-Waututh Nation's rights to self-governance.

As stated in article 29 of UNDRIP, First Nations "have the right to the conservation and protection of the environment and the productive capacity of their lands or territories and resources." Making governance decisions on environmental issues may be essential to protect the environment and natural resources that are integral to Tsleil-Waututh Nation. Most importantly, Canada also has obligations to protect the waters and waterways relied upon by Indigenous groups to meaningfully exercise their rights.

Tsleil-Waututh Nation has stated their concerns with regard to habitat loss for both terrestrial and marine habitat and has been involved in several fish habitat restoration projects within their territories, to protect and re-establish fish populations to a level where they can continue or reinstate fishing, particularly in spawning and terminal areas. With the objective of achieving 'net gain', Tsleil-Waututh Nation and other Nations have spent many years and invested millions of dollars in restoring the ecology of the Fraser. However, these restoration efforts are jeopardized by projects like TMJ and the potential effects of project-associated marine shipping

activities. As suggested by recent studies[310], under a business-as-usual scenario, there is a likely result in the loss of two-thirds of the species in the Fraser estuary in the next 25 years.

14.8.9.1 SEVERITY OF RESIDUAL EFFECTS – IMPACTS ON TSLEIL-WAUTUTH NATION SELF-GOVERNANCE, FOOD SOVEREIGNTY AND STEWARDSHIP RESPONSIBILITIES

Potential TMJ-related residual effects to Tsleil-Waututh's ability to practice self-governance were identified above. From Tsleil-Waututh Nation's perspective, any TMJ-related impacts to Tsleil-Waututh Nation fisheries will impact Tsleil-Waututh Nation's rights to self-governance.

The severity of this residual effect on Tsleil-Waututh Nation's experience while fishing can also be assessed using the methods described above.

- *The duration of the impact (impacts to Tsleil-Waututh Nation's fisheries as discussed above) would persist through the life of TMJ (up to AD 2053);*
- *This impact would be irreversible due to habitat destruction though many components would be reversable following a cessation of project shipping (after AD 2053), but only after 30 years of negative impact; and*
- *The cumulative impact of this additional impact on Tsleil-Waututh Nation's self-governance compared to an AD 1792 baseline would be significant.*

The severity of these negative impacts on Tsleil-Waututh Nation peoples' is assessed to be extreme.

14.8.10 OVERALL IMPACTS TO TSLEIL-WAUTUTH NATION'S ABORIGINAL INTERESTS

After consideration of all available evidence, and evaluation of the probability of proposed mitigation measures, several project related activities are anticipated to have negative residual effects which will have serious impacts on Tsleil-Waututh Nation's Aboriginal right to fish, to practice their traditional culture, and the protection of their cultural heritage.

- *The anticipated severity and seriousness of TMJ-related impacts to SRKW and resulting effects on Tsleil-Waututh Nation's ability to maintain their culture and Tsleil-Waututh Nation cultural*

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[310] *Kehoe, LJ, Lund, J, Chalifour, L, et al. (2021) Conservation in heavily urbanized biodiverse regions requires urgent management action and attention to governance. Conservation Science and Practice. 2021; 3:e310. https://doi.org/10.1111/csp2.310*

health are assessed as extreme, and these impacts would be irreversible (Section 14.8.6.1);

- *The anticipated severity and seriousness of project related impacts on ongoing Tsleil-Waututh Nation spiritual practices in a portion of the marine area are assessed at extreme and would be irreversible (Section 14.8.6.2);*
- *The anticipated severity and seriousness of TMJ-related impacts to Tsleil-Waututh's Aboriginal interest in protecting and preserving their cultural heritage is assessed at low to high and these impacts would be irreversible (Section 14.8.6.3);*
- *The anticipated severity and seriousness of TMJ-related contributions to climate change and the resulting effects on Tsleil-Waututh Nation's ability to maintain their culture and Tsleil-Waututh Nation cultural health are assessed as very high and the impacts would be irreversible (Section 14.8.6.4);*
- *The anticipated severity and seriousness of TMJ-related impacts from marine shipping on Tsleil-Waututh Nation's Aboriginal right to fish and harvest crab is assessed at very high (both FSC and commercial fisheries), and these impacts would be ongoing throughout the lifetime of TMJ (Section 14.8.7);*
- *The anticipated severity and seriousness of TMJ-related impacts from accidents and malfunctions on Tsleil-Waututh Nation's Aboriginal right to fish and harvest crab would be low to extreme and the impacts could be reversable or irreversible (Section 14.8.7);*
- *The anticipated severity and seriousness of project related impacts from destruction of fish habitat on Tsleil-Waututh Nation's Aboriginal right to fish would be very high and the impacts would be irreversible (Section 14.8.7);*
- *The anticipated severity and seriousness of TMJ-related contributions to climate change and the resulting effects on Tsleil-Waututh Nation's Aboriginal right to fish and harvest crab would be very high and the impacts would be irreversible (Section 14.8.7);*
- *The anticipated severity and seriousness of TMJ-related impacts to Tsleil-Waututh Nation people's experience while fishing/crabbing is assessed at moderate to very high and irreversible (Section 14.8.7);*
- *The anticipated severity and seriousness of the mooring of vessels in the project area on Tsleil-Waututh Nation's ability to harvest waterfowl is assessed at very high and the impacts would be irreversible (Section 14.8.8); and*
- *The anticipated severity and seriousness of TMJ-related impacts to Tsleil-Waututh Nation's ability to practice self-governance, food sovereignty and stewardship responsibilities would be extreme and the impacts would be irreversible (Section 14.8.9)*

Overall, TMJ will significantly interfere with Tsleil-Waututh Nation's rights, title and interests and will cause serious and irreversible impacts to Tsleil-Waututh Nation people's ability to meaningfully exercise their rights in their territory.

The potential impacts described above vary dramatically in magnitude. Some of the potential impacts could devastate Tsleil-Waututh Nation's primary sources of traditional food, while others would permanently impair Tsleil-Waututh Nation's cultural revival. As stated above, aspects of construction, operation and decommissioning of TMJ have been identified as having negative impacts to Tsleil-Waututh Nation's fishing, harvesting, and spiritual practices, ranging in severity and seriousness from low to extreme. TMJ cannot be approved by Crown decision makers until these impacts have been adequately addressed.

The cumulative effects of urbanization and industrialization has severely impacted Tsleil-Waututh Nation and eroded their ability to exercise their rights in their traditional territory. The ecology of the Fraser Delta is already impacted by a number of projects and from Tsleil-Waututh Nation's perspective this assessment is insufficient in its consideration of cumulative effects of TMJ in concert with other projects and activities that have been carried out in the vicinity. The EA conducted for TMJ ignored cumulative effects of associated habitat loss on the Fraser and the Salish Sea ecosystem, omitted an adequate upstream and downstream GHG assessment including indirect emissions, and refuted any connection to the FortisBC LNG Phase 2 Expansion project.

The Province's piece-meal project by project approach to consulting Tsleil-Waututh Nation regarding the effects of authorizing developments in their territory was inadequate (no assessment as a whole) and from Tsleil-Waututh Nation's perspective this is a flaw in the process and does not justify an infringement on Tsleil-Waututh Nation rights. Given the ecological importance of the Fraser and its current degraded condition, the Crown should, in Consultation with Indigenous Nations, develop, undertake and implement a regional cumulative effects assessment[311] and use such an assessment to help determine whether or not individual projects like TMJ should go ahead.

[311] This was also stated in the Panel Report for RBT2. Recommendation 70: The Panel recommends the Government of Canada undertake two regional environmental assessments for the Fraser River estuary and the Salish Sea to establish an environmental baseline, identify environmental and cumulative effects of the areas, and mitigation and follow-up requirements. The regional assessment should be used to develop and implement intergovernmental Management Programs of the Fraser River estuary and the Salish Sea (pg. 495)

14.8.11 THE EAO'S PERSPECTIVE AND INPUTS

The following section provides the EAO's perspectives and inputs regarding consultation and potential impacts of TMJ on Tsleil-Waututh Nation's Aboriginal Interests.

The EAO's Perspective on the Marine Shipping Assessment

Tsleil-Waututh Nation raised concerns about the geographic scope of the MSA, and the separation of TJLP's MSA from the Application for the Original area (that is, the proposed jetty to Sand Heads) and that it resulted in an undercalculation of cumulative effects. Concerns about the geographic scope of the MSA were shared with other Indigenous Groups and are discussed in Section 13.2.2. The EAO is of the view that the approach taken by TJLP to submit the MSA as an addendum to the Application is consistent with the regulatory review process, in that once an Application has been accepted for review, any further or additional studies that may be required during Application Review are undertaken and submitted as Addenda or Supplementary Reports. In the MSA, TJLP considered the effects assessment of the Application and identified linkages to the effects identified in the MSA. The EAO conducted cumulative effects analysis on those VCs with predicted residual effects, has considered the original application area together with the MSA where possible and appropriate, and as such, is of the view that cumulative effects have been appropriately assessed.

Tsleil-Waututh Nation disagrees with the geographic scope of the MSA as it does not extend to the 200 nm limit and does not include all of SRKW critical habitat and applicable US waters. This was included above as a concern raised by Tsleil-Waututh Nation in the EA, and Tsleil-Waututh Nation considers this issue not addressed.

The EAO and Tsleil-Waututh Nation are of the view that it has been a positive process working together. The EAO is of the perspective that TMJ-specific effects have been mitigated to the extent possible through provincial conditions and recommended KMMs under CEAA 2012, acknowledging that Tsleil-Waututh Nation have outstanding concerns.

The EAO's Perspective on Upstream Greenhouse Gas Assessment and No Project Case

Tsleil-Waututh Nation raised concerns about increased GHG emissions as a result of TMJ and the inadequacy of the upstream GHG assessment. These concerns were shared with other Indigenous Groups and are discussed in Section 2.2.3.

Tsleil-Waututh Nation also raised concerns about the potential link between TMJ and increased LNG production via the proposed FortisBC Phase 2 Tilbury Expansion Project and associated upstream GHG emissions. Tsleil-Waututh Nation expressed concerns that TMJ would cause increased upstream GHG emissions because the transportation of the same volume of LNG through alternative means via ISO containers appeared not to be feasible based on the

information provided. The Application reported that GHG emissions would be anticipated regardless of whether TMJ is constructed or not. During Application Review, TJLP provided additional information to demonstrate the economic feasibility of shipping LNG by ISO containers and through alternate ports (i.e., the most likely scenario if there were "no project"). The EAO understands that the additional information was considered reasonable by ECCC, and although some uncertainty remains, TJLP demonstrated that shipping LNG to Asia via ISO container could be economical, at least for some volumes. The EAO is of the perspective that upstream GHG emissions are outside the scope of the TMJ GHG effects assessment and are considered only for context, pursuant to a requirement by ECCC as this is a substituted project. The EAO has not included upstream GHG emissions information in the EAO's characterization of effects or considered in the determination of significance of TMJ effects on GHG emissions.

The EAO is of the view that the issue is adequately resolved for the purposes of the EA. The EAO have also been engaging and collaborating with Tsleil-Waututh Nation on the development of the provincial TOC, including a draft condition for a Greenhouse Gas Reduction Plan.

The EAO has updated the GHG Management section of this Report (Section 5.2) to capture and better reflect Tsleil-Waututh Nation's concerns and views expressed regarding the interconnection between TMJ and increased LNG production and provides more detailed discussion on these key issues raised by Tsleil-Waututh Nation.

Tsleil-Waututh Nation considers that upstream, indirect and downstream GHG TMJ-related emissions are not adequately assessed. Emissions being considered are in relation to provincial and federal emissions levels and not provincial or federal climate targets.

The EAO and Tsleil-Waututh Nation are of the view that it has been a positive process working together. The EAO is of the perspective that TMJ-specific effects have been mitigated to the extent possible through provincial conditions and recommended KMMs under CEAA 2012, acknowledging that Tsleil-Waututh Nation have outstanding concerns.

The EAO's Inputs and Perspectives on Potential Impacts on Other Traditional and Cultural Interests

The EAO evaluated the potential effects on other traditional and cultural interests attributable to TMJ which apply broadly to Indigenous Groups. These potential effects are summarized in Section 13.3.3. The EAO is satisfied that the key impacts to traditional and cultural interests summarized in Section 13.3.3 apply to Tsleil-Waututh Nation. The following section focuses on the specific issues and potential impacts unique to Tsleil-Waututh Nation's traditional and cultural interests.

For the impact assessment of TMJ on Tsleil-Waututh Nation's other traditional and cultural interests, the EAO looked at the following categories of factors: Biophysical, Geospatial (places, sites and access), and Social, Cultural and Experiential. Where Tsleil-Waututh Nation have provided additional information beyond the factors listed above, the EAO has also considered this information in the overall seriousness of impact assessment.

The EAO concludes that, in consideration of the available information, Tsleil-Waututh Nation's own Part C assessment, the EAO's consultation with Tsleil-Waututh Nation, Tsleil-Waututh Nation's engagement with TJLP, TJLP's commitments, the EAO's proposed EAC conditions if an EAC is issued and the recommended KMMs under CEAA 2012, the EAO is of the view that the concerns raised regarding potential TMJ-related impacts, combined with existing conditions, to Tsleil-Waututh Nation's other cultural and traditional interests have been adequately considered for the purposes of the EA for TMJ. The EAO is of the view that TMJ-specific effects have been addressed and mitigated to the extent possible with proposed provincial conditions and recommended KMMs under CEAA 2012, acknowledging that Tsleil-Waututh Nation has identified that some impacts to intangible cultural heritage and cultural health are unmitigable.

The EAO considered Tsleil-Waututh Nation's perspectives on cumulative effects and Tsleil-Waututh Nation's concern about extensive shipping passes through the Salish Sea, and the additional marine shipping proposed by TMJ and other projects would increase frequency of overall vessel traffic through an already busy shipping area. The EAO acknowledges that there are already vessels transiting the shipping lanes of the Salish Sea which can impact Indigenous mariners' access to and quality of experience for other cultural and traditional uses of marine areas. While the EAO recognizes there is some uncertainty when considering how cumulative effects impact Aboriginal Interests, the EAO agrees with Tsleil-Waututh Nation, that any increase in vessel traffic in the shipping lanes would potentially be more serious when combined with past, present, and reasonably foreseeable activities. The EAO understands that Tsleil-Waututh Nation concluded that the anticipated severity of TMJ-related impacts to other traditional and cultural interests were assessed up to extreme.

The key factors that the EAO has identified that inform EAO's overall impact conclusion of TMJ on Tsleil-Waututh Nation's other traditional and cultural interests are summarized as follows:

Cultural and Heritage Resources:

- The EAO's conclusions in the Heritage Resources section of Part B found no residual effects to paleontological resources and historical and physical heritage and no residual effects on Heritage Resources from erosion due to wake effects along the shorelines of the Fraser River in the RAA or in the MSA area;
- Tsleil-Waututh Nation expressed views that effects on SRKW would impact the cultural

health of Tsleil-Waututh Nation people;

- The EAO's conclusions in the Marine Mammals chapter in Part B found residual effects from TMJ-related vessels on Southern Resident Killer Whales and significant cumulative effects to Southern Resident Killer Whales
- The lower Fraser River is highly industrial and the TMJ site is previously disturbed. The MSA area is a heavily utilized marine environment. These factors increase the seriousness of impact of TMJ.

Geospatial (places, sites and access):

- During construction, access to the TMJ site would be restricted for three years. During operations, Indigenous mariners and fishers would avoid entering and remaining in the marine terminal area due to the warning signs and notifications regarding elevated public risk, in particular when vessels would be berthing, loading, or de-berthing at TMJ (on average, one vessel call a day in the BVS at full capacity). At the scale of the LAA and RAA this would amount to a low magnitude impact to access from impacts at the TMJ site and lower Fraser River;
- The small number of TMJ-related vessels relative to current vessel traffic are predicted to have a negligible to low effect on cultural activities in the MSA area in terms of access from regularly occurring (i.e., one vessel call per day, on average, under the BVS) vessel transits to and from TMJ's marine terminal area could cause relatively infrequent and short-duration interruptions to access;
- Tsleil-Waututh Nation have identified sites of cultural significance both in the vicinity of the TMJ site (i.e., historic village site of Dl'akti'nes and waterlogged archaeological deposits [including a fish weir]);
- Tsleil-Waututh Nation noted the importance of sacred tunnels that converge in the Tsawwassen and Point Roberts area, and connect far-reaching areas of the broader region together; and
- Tsleil-Waututh Nation expressed that extensive shipping passes through the Salish Sea, and the additional marine shipping proposed by TMJ and other projects would increase frequency of overall vessel traffic through an already busy shipping area.

Social, Cultural, Experiential:

- The EAO's conclusions in the Noise assessment in Part B found sensory disturbances from noise from the TMJ site are anticipated to be negligible to low magnitude, temporary and short-term;

- The EAO's conclusions in the Visual Quality chapter in Part B found a negligible to low impact to the existing visual landscape character in the Fraser River;
- Potential negligible impacts from TMJ-related vessel traffic during operations affecting visual quality, noise and vessel wake (with an increasing magnitude of effect the closer one is to the vessels);
- Tsleil-Waututh Nation expressed that supernatural beings and features in the marine waters off of Tsawwassen and Point Roberts, including sacred tunnels, are adversely affected by pollution, including lights, noise and physical/chemical pollution;
- Tsleil-Waututh Nation's view that TMJ-related shipping would impact Tsleil-Waututh Nation's ongoing participation in their traditional Coast Salish culture by interference with Tsleil-Waututh Nation's ability to undertake traditional cultural practices in spiritually significant areas located in proximity to Tsawwassen and Point Roberts in their preferred manner;
- Tsleil-Waututh Nation noted that sensory disturbance, chemical pollution from vessels, as well as perceived risks to safety could leave to reductions in TWN's use of an area, including avoiding an area altogether;
- Tsleil-Waututh Nation's cultural health values, including the cultural and spiritual relationship with killer whales, the ability to participate in all aspects of their traditional Coast Salish culture and transmit their culture to younger generations, and the sense of identity, meaning and satisfaction derived by Tsleil-Waututh Nation community members from participating in their traditional culture; and
- Tsleil-Waututh Nation expressed that TMJ-related GHG emissions would contribute to climate change, which would result in impacts Tsleil-Waututh Nation's health, cultural practices and cultural health.

Mitigations:

- Proposed provincial conditions to mitigate impacts to Tsleil-Waututh Nation's cultural heritage values are the development of the Cultural and Archaeological Resources Management Plan for the TMJ site, the lighting, noise and vibration management as part of the CEMP and OEMP, as well as the Water Quality Management Plan and Air Quality Management Plan which must be developed in consultation with Indigenous Groups and the Indigenous Cultural Awareness and Recognition Condition.
- *Heritage Conservation Act* (RSBC 1996, c. 182).
- Recommended KMMs under CEAA 2012 for Cultural Heritage, a Marine Communications Plan, a Marine Access and Transportation Plan, including a follow-up

program to monitor and follow-up on potential impacts to Current Use, a Vessel Traffic Management Plan to reduce impacts to marine mammals, in particular SRKW, from impacts due to marine shipping, and requirement for TJLP to manage operations, such that, in each calendar year TMJ would receive a maximum of 365 LNG vessel calls, of which a maximum of 68 would be LNG carrier calls.

The EAO understands that Tsleil-Waututh Nation's cultural health refers to the ability of Tsleil-Waututh people to actively participate in all aspects of their traditional culture, to transmit (teach) their culture to younger generations, and the sense of identity, meaning and satisfaction derived by people from participating in their traditional culture. The EAO understands that Tsleil-Waututh Nation view their cultural connection to killer whales as a significant part of their traditional Coast Salish culture, and that the maintenance of this cultural connection is important for the cultural health of Tsleil-Waututh people. The EAO appreciates the work done by Tsleil-Waututh Nation to provide an assessment of potential impacts to Tsleil-Waututh Nation's cultural health and right to practice culture and that Tsleil-Waututh Nation has significant concerns that the loss of SRKW would have a profound negative impact to the cultural health of their community members. The EAO considered cultural health components as part of the assessment of impacts on other traditional and cultural interests above, including due to impacts on SRKW and cultural heritage resources.

The EAO acknowledges that Tsleil-Waututh Nation's perspective is that there are no available mitigations to avoid or reduce potential impacts from marine shipping to cultural use of marine areas associated with sacred tunnels. The EAO recommends a Cultural Heritage KMM under CEAA 2012 to address the effects on Tsleil-Waututh Nation's tangible and intangible cultural losses caused by the TMJ. As part of the measures, TJLP would be required to consider developing or contributing to Indigenous-led programs to preserve and enhance cultural heritage.

The EAO's Inputs and Perspectives on Potential Impacts on Fishing

The EAO evaluated the potential effects on fishing rights attributable to TMJ which are summarized in Section 13.3.1. The EAO is satisfied that the key impacts to biophysical components resulting in changes to fish quantity and quality, changes in access to fishing resources, and changes to social, cultural, and spiritual values associated with traditional fishing activities summarized in Section 13.3.1 apply to Tsleil-Waututh Nation. In the Current Use section of Part B (section 11.4), the EAO found it is reasonable to expect that past effects would combine with effects from TMJ-related marine shipping to result in significant cumulative effects to current use for fishing and other cultural use of marine areas. The

following section focuses on the specific issues and potential impacts unique to Tsleil-Waututh Nation's Aboriginal right to fish.

For the impact assessment of TMJ on Tsleil-Waututh Nation's right to fish, the EAO looked at the following factors: Biophysical, Geospatial (places, sites and access), and Social, Cultural and Experiential. Where Tsleil-Waututh Nation have provided additional information beyond the factors listed above, the EAO has also considered this information in the overall seriousness of impact assessment. As noted in section 13.1 above, the EAO considers that where the cumulative effects of past and present activities have negatively affected conditions today compared to those required for the meaningful practice of the right, the conclusion on impacts from a current project on that right would be more serious. The EAO notes that existing constraints and levels of impact in the lower Fraser River have increased the seriousness of impact from TMJ on Tsleil-Waututh Nation's right to fish.

In consideration of the available information, Tsleil-Waututh Nation's own Part C assessment, the EAO's consultation with Tsleil-Waututh Nation, Tsleil-Waututh Nation's engagement with TJLP, TJLP's commitments, the EAO's proposed EAC conditions if an EAC is issued and the recommended KMMs under CEAA 2012, TMJ combined with existing conditions is expected to result in a moderate impact on Tsleil-Waututh Nation's right to fish.

The EAO understands that Tsleil-Waututh Nation concluded that the anticipated severity of TMJ-related impacts to the right to fish were assessed up to extreme. The key factors that inform the EAO's overall impact conclusions of TMJ on Tsleil-Waututh Nation's right to fish are summarized as follows:

Biophysical:

- The EAO's conclusions in the Fish and Fish Habitat chapter in Part B that TMJ construction (just over three years in duration) and operations (annual dredging) are likely to result in low magnitude adverse residual effects to fish habitat and potential behavioural responses by fish species at the TMJ site, and low magnitude and frequency impacts to harm and mortality of sturgeon due to potential vessel strikes. No residual effects are predicted to fish and fish habitat in the MSA area;
- The lower Fraser River is highly industrial and the TMJ site is previously disturbed. The MSA area is a heavily utilized marine environment. These factors increase the seriousness of impact of TMJ on the right to fish;
- Tsleil-Waututh Nation has not presently been able to obtain their full FSC allocation of sockeye and have been unable to harvest eulachon and sturgeon over recent decades; and expressed concern that any net decrease in habitat would very likely reduce each species' population, and hence further decrease their availability for Tsleil-Waututh

Nation harvest.

Geospatial (places, sites and access):

- During construction, access to the TMJ site would be restricted for three years. During operations, Indigenous mariners and fishers would avoid entering and remaining in the marine terminal area due to the warning signs and notifications regarding elevated public risk, in particular when vessels would be berthing, loading, or de-berthing at TMJ (on average, one vessel per day calling at the jetty in the BVS at full capacity). At the scale of the LAA and RAA this would amount to a low magnitude impact to access from impacts at the TMJ site;
- The EAO's conclusions in the Current Use section of Part B of this Report found that TMJ-related vessel transits would have low magnitude effect to access to fishing compared to baseline numbers of vessel transits, that could be experienced as higher in the Fraser River as a change from baseline compared to the Salish Sea. This effect would be due to relatively infrequent and short duration vessel movements to pass through known fishing areas in the Fraser River and Salish Sea;
- Specific to the BVS there is potential for higher frequency of interactions to occur between TMJ-related vessels and Indigenous Groups, including Tsleil-Waututh Nation, engaging in vessel-based FSC fishing in the lower Fraser River during FSC fishing windows.
- Tsleil-Waututh Nation fish in the Salish Sea, approaches to the Fraser River, lower Fraser River and in the TMJ area which is located within Tsleil-Waututh Nation's FSC salmon fishing area;
- Similar to sockeye and chinook salmon, Tsleil-Waututh Nation have stated there are no alternative sources of eulachon and sturgeon within Tsleil-Waututh Nation territory besides the lower Fraser River area;
- Tsleil-Waututh Nation seek to increase their allocations of fishing in the Fraser River and have future aspirations to fish eulachon and sturgeon pending recovery of the species;
- Tsleil-Waututh Nation obtain the bulk of their FSC crab from the Tsawwassen area and stated that it is competitive with frequent interactions with larger vessels and tugs; and
- Tsleil-Waututh Nation expressed that industrial development has increased rapidly in and along the Fraser River, resulting in limitations in accessing marine foods.

Social, Cultural and Experiential:

- As outlined in the noise and visual quality assessments in Part B, potential negligible to low magnitude impacts due to a change in noise and visual quality during construction and to changes in visual quality during operations;
- The area around TMJ is important to Tsleil-Waututh Nation as the former village site is across the Fraser River and the lower Fraser River is preferred fishing location for Tsleil-Waututh Nation in the Fraser River;
- Potential concerns regarding safety and air quality during operations in the Fraser River and Salish Sea, and experience in the marine terminal area due to the warning signs and notifications regarding elevated safety risks due to TMJ operations;
- Tsleil-Waututh Nation expressed that TMJ would negatively affect the experience of fishing, including cultural sharing and cultural transmission, due to increased noise and air pollution from vessel traffic and the presence of large vessels;
- Tsleil-Waututh Nation noted that the area of the lower Fraser River is already heavily modified by industrial development and is heavily trafficked by vessels;
- Tsleil-Waututh Nation's values associated with their right of self-governance, including stewardship responsibilities to the resources of their territory and their ability to secure food sovereignty; and
- Tsleil-Waututh Nation expressed concerns about the linkage between consumption of traditional foods, such as shellfish and salmon, and cultural health, in that eating lower amounts of fish and shellfish is both a health risk and an emotional and spiritual loss related to traditional activities, ceremonies and a sense of place and cultural continuity.
- Tsleil-Waututh Nation's cultural values, including the view that the ability to access and sustainably manage resources is directly linked to their cultural health, their identity, and provides important opportunities to pass on cultural teachings and the hən̓q̓əmin̓əm language to the next generation.

Mitigations:

- Proposed mitigations for potential impacts to Tsleil-Waututh Nation's right to fish, include mitigations to reduce impacts to noise and visual quality in the CEMP and OEMP as well as the recommended KMMs under CEAA 2012, specifically the Fish Mitigations to Reduce Harm and Mortality, Fish Habitat Offset Plan, and Vessel Traffic Management Plan;
- The EAO also recommends KMMs under CEAA 2012 for a Marine Communication Plan

and a Marine Access and Transportation Plan, that would require TJLP to develop measures to mitigate effects on Indigenous traditional use activities, including LNG carrier call scheduling to reduce LNG carrier calls during the anticipated timing window for Indigenous fishers operating under DFO fishing licences, and synchronizing bunker vessels arrivals at and departures from the jetty with regularly scheduled marine traffic (not associated with TMJ) when Indigenous fishers are operating under DFO fishing licences; and

- TJLP would be required to manage, during operations, such that in each calendar year, TMJ would receive a maximum of 365 LNG vessel calls, of which a maximum of 68 would be LNG carrier calls.

The EAO is aware that TJLP is actively engaged with Indigenous Groups regarding a proposal to contribute up to $2 million to the First Nations Fisheries Legacy Fund, which is an Indigenous-led program that includes Tsleil-Waututh Nation, that supports recovery programs for chinook salmon, eulachon and sturgeon in the Fraser River and Salish Sea. Tsleil-Waututh Nation have expressed to the EAO that the proposal does not constitute meaningful offsetting or accommodation. Tsleil-Waututh Nation stated that the proposal should not be viewed by Crown decision-makers as mitigating residual effects and that the proposal cannot be considered as accommodation to any specific individual Indigenous Group. For more information about the EAO's consideration of TJLP's contribution proposal, refer to Section 13.1 on Current Context and Cumulative Effects.

The EAO's Inputs and Perspectives on Potential Impacts on Hunting, Trapping and Gathering

The EAO evaluated the potential effects on hunting, trapping and gathering rights attributable to TMJ which apply broadly to Indigenous Groups. These potential effects are summarized in Section 13.3.2. The EAO is satisfied that the key impacts to biophysical components resulting in changes to wildlife and vegetation quantity and quality, changes in access to hunting, trapping and gathering areas, and changes to social, cultural, and spiritual values associated with traditional hunting, trapping and gathering activities summarized in Section 13.3.2 apply to Tsleil-Waututh Nation. The following section focuses on the specific issues and potential impacts unique to Tsleil-Waututh Nation's Aboriginal right to hunting, trapping and gathering.

For the assessment, the EAO looked at the following factors: Biophysical, Geospatial (places, sites and access), and Social, Cultural and Experiential. Where Tsleil-Waututh Nation have provided additional information beyond the factors listed above, the EAO has also considered this information in the overall seriousness of impact assessment.

In consideration of the available information, consultation with Tsleil-Waututh Nation, Tsleil-Waututh Nation's engagement with TJLP, TJLP's commitments, the EAO's proposed EAC

conditions if an EAC is issued and the recommended KMMs under CEAA 2012, TMJ is expected to result in a negligible effect on Tsleil-Waututh Nation's right to hunt, trap and gather.

The EAO understands that Tsleil-Waututh Nation concluded that the anticipated severity of TMJ-related impacts to the right to hunt, trap and gather were assessed up to very high. The key factors that the EAO has identified that inform the EAO's overall impact conclusions of TMJ on Tsleil-Waututh Nation's right to hunt, trap and gather are summarized as follows:

Biophysical:

- The EAO's conclusions at the TMJ site on adverse residual effects to Wildlife and Wildlife Habitat and Vegetation (see respective sections in Part B) indicate negligible to low magnitude residual effects on loss or alteration of wildlife habitat, sensory disturbance from noise and light, and mortality; as well as low magnitude residual effects on wetland and riparian ecosystems;
- The EAO's conclusions in the MSA area on adverse residual effects to Marine Birds (see the Wildlife section in Part B) indicate negligible to low magnitude residual effects related to mortality; and
- Species hunted historically and continuously by Tsleil-Waututh Nation include ungulates, such as deer and elk, bear, ducks, and other waterfowl.

Geospatial (places, sites and access):

- Tsleil-Waututh Nation noted they are uncertain whether berry harvesting (particularly cranberry harvesting) continues in the TMJ area and reported harvesting aquatic plants (such as seaweed), but specific harvest areas have not been identified;
- Tsleil-Waututh Nation hunt waterfowl in the Salish Sea but no longer hunt birds in certain areas of the Fraser Delta due to restrictions on hunting within municipalities; however, Tsleil-Waututh Nation have future aspirations of increased waterfowl hunting;
- Construction (just over three years in duration) and operations (30 years) are unlikely to cause disruptions to Tsleil-Waututh Nation's access to areas traditionally used for hunting, trapping, and gathering activities at the TMJ site or in the MSA area;
- The upland portion of the TMJ site is situated on fee simple (private) land, where access to traditional uses has already been excluded; and
- For harvesting of marine species from the water, the small number of TMJ-related vessels relative to current vessel traffic are predicted to have a negligible effect in terms of access.

Social, Cultural and Experiential:

- Potential impacts to experience in the vicinity of the TMJ site and along the shipping route due to a change in noise and visual quality, as described in Part B, during construction and operations which are anticipated to be negligible to low in magnitude in the Fraser River and Salish Sea;
- Tsleil-Waututh Nation's cultural health values, including access to traditional foods, and traditional subsistence practices and teachings; and
- Tsleil-Waututh Nation expressed concerns about the linkage between consumption of traditional foods and cultural health.

Mitigations:

- Proposed provincial conditions to mitigate impacts to Tsleil-Waututh Nation's right to hunt, trap and gather are the Vegetation and Wetland Management and Offsetting Plan, and the wildlife and wildlife habitat management, light management, and noise management components of the CEMP and OEMP, all of which would require consultation with Indigenous Groups. The EAO is also proposing these mitigations as KMMs under CEAA 2012 which would include the requirements for migratory birds, lighting and wildlife and wildlife habitat mitigation and monitoring, and a Wetland Compensation Plan; and
- All vessels would adhere to the Marine Regulations and Legislation regulating vessel noise and lighting.

14.8.12 THE EAO'S AND TSLEIL-WAUTUTH NATION'S CONCLUSIONS

Where Tsleil-Waututh Nation and the EAO differed in their conclusions and did not reach consensus, the parties sought to understand the factors considered in the assessment and how the different methodologies and value systems used may have resulted in different conclusions. For example:

- The EAO's assessment of TMJ's residual effects and cumulative effects on VCs (in Part B) which have informed the EAO's assessment of impacts on Aboriginal Interests (in Part C), whereas Tsleil-Waututh Nation's Assessment for impacts to biophysical factors used a different methodology and constructs (see Tsleil-Waututh Nation Section 14.9.2) compared to the EAO's assessment presented in Part B, which led to differing perspective on the validity of the EA findings;
- Tsleil-Waututh Nation mandates (based on their Stewardship Policy) that a

cumulative effects assessment must be conducted for all effects, not just for residual effects, whereas the EAO conducts cumulative effects assessments when residual effects for a VC are found (Part B). The EAO did not conduct a comprehensive regional cumulative effects assessment on all the various existing constraints and pathways of effect for Current Use for fishing or Cultural Heritage;

- The EAO's consideration of the current state of environmental values using current environmental baseline conditions instead of historical baseline conditions (prior to contact-1752) to assess the potential project effects and cumulative effects on Tsleil-Waututh Nation's Aboriginal Interests;
- The broader geographic scope and worldview considered in Tsleil-Waututh Nation's assessment of cumulative effects to VCs and potential impacts to Tsleil-Waututh Nation's Aboriginal Interests, including climate change effects from increased GHG emissions;
- The EAO's consideration of TJLP's proposed mitigation and offsetting measures in the assessment of residual effects to VCs in accordance with BC's Environmental Mitigation Policy, and differing views on the effectiveness and applicability of those measures;
- The EAO's consideration of the recommended KMMs required under CEAA, 2012 and proposed EA conditions, to address project-specific residual effects to VCs and differing views on the effectiveness and applicability of the proposed conditions;
- The EAO's assessment of the 'Cultural Component' of Aboriginal Interests, particularly impacts on Tsleil-Waututh Nation Intangible Cultural Heritage and the CULRTP Assessment and linkage to Tsleil-Waututh Nation Cultural Health. Tsleil-Waututh Nation views that cultural components related to fishing rights, cultural heritage or health are limited to material culture (archeological resources, access to spiritual sites or fishing spots) or the biophysical aspects of health, not 'living culture' and expressions of intangible cultural heritage such as beliefs, traditions, knowledge, and language. Therefore, in Tsleil-Waututh Nations' view, mitigation measures only address those tangible aspects of culture that are easy to identify, measure and evaluate. Despite collaborative efforts, no solutions were identified that could fully mitigate TMJ-related impacts to intangible cultural values, noting that impacts to some of these values are unmitigable. The EAO has proposed a Cultural Heritage KMM under CEAA 2012 to address the effects on Tsleil-Waututh Nation's tangible and intangible cultural losses caused by the TMJ. However, the EAO acknowledges that Tsleil-Waututh Nation stated that impacts on intangible cultural heritage are irreversible and unmitigable. In Tsleil-Waututh Nation's

perspective, these impacts can only be addressed by establishing legally binding conditions, which would require TJLP to develop or contribute to Indigenous-led programs to preserve and enhance TWN cultural heritage; and

- The EAO's analytical framework for assessing the seriousness of impacts on Aboriginal Interests. Social and cultural impacts are represented and valued differently in the EA process. In Tsleil-Waututh Nation's perspective, the characterization and determination of significance of potential environmental effects is based on implicit assumptions rather than perceived risks. Tsleil-Waututh Nation continues to apply their laws and stewardship principles, and from their perspective, the assessment has minimized interactions and overlaps of TMJ with Tsleil-Waututh Nation traditional territories and rights. Thus, Tsleil-Waututh Nation are in the view that impacts that are less tangible and narrower in scope tend to be viewed, erroneously, as less serious; and
- The different knowledge systems informing values across impacts. From Tsleil-Waututh Nation's perspective it is difficult to categorize impacts. Some Values do not fit in traditional notions of valued components, particularly when differentiating biophysical and non-biophysical factors or tangible and non-material components. The EAO considers a list of factors in its assessment of impacts to Aboriginal Interests and Treaty Rights (Section 12.2 Impact Assessment Methods). Tsleil-Waututh Nation stated that, in accordance to Tsleil-Waututh Nation's laws, these are generally interconnected and cannot be de-contextualized.

Where the EAO differs in their conclusions, Tsleil-Waututh Nation, guided by their laws and principles, views their conclusions (Section 14.9.10) as the conclusions which best represent the impacts of TMJ on Tsleil-Waututh Nation's constitutionally protected rights, title and interests.

14.9 SNUNEYMUXW FIRST NATION

14.9.1 COMMUNITY PROFILE

Snuneymuxw First Nation (Sna-NAI-muxw/Snuh-NAY-mowh) are a Coast Salish Indigenous peoples. Snuneymuxw First Nation's traditional territory and marine areas are located in the mid-Island and Gulf Islands regions on the southern east coast of Vancouver Island, with reserve lands in areas near Nanaimo, and with several village and field sites throughout the region, and up into the Fraser River area of the Lower Mainland of British Columbia. Snuneymuxw First Nation marine areas include the southern east coast of Vancouver Island and extends through the Salish Sea, the Gulf Islands and into the Fraser River. Snuneymuxw language is Island Hul'q'umin'um' (Hul ka MEE num). Snuneymuxw First Nation has a population of over 2,000 people with approximately 30 % of registered members residing on Snuneymuxw First Nation reserve lands[312]. Despite Snuneymuxw First Nation's relatively large population size, Snuneymuxw First Nation has a relatively small total area of reserve lands, including six reserves (i.e., one south of the Nanaimo city centre, three are situated along the Nanaimo River, and two are in the Degnen Bay area on Gabriola Island).

The way of life for Snuneymuxw First Nation can be characterized as residing in villages and marine areas and reliance upon the abundance of resources in the Snuneymuxw First Nation territory. Snuneymuxw First Nation consistently moved throughout their territory and marine areas based upon the seasons, practiced Snuneymuxw spirituality and traditions, and placed markers in the territory and marine areas identifying it as Snuneymuxw First Nation. The Snuneymuxw People identify historic village sites throughout mid-Vancouver Island, the Gulf Islands, and the Fraser River[313]. Of relevance to TMJ, Snuneymuxw First Nation has identified a significant marine, cultural, and spiritual connection to the Fraser River, including multiple locations where Snuneymuxw First Nation historically held villages and fields, fishing stations

[312] Indigenous and Northern Affairs Canada. 2021. First Nation Profiles – Snuneymuxw First Nation. https://fnp-ppn.aadnc-aandc.gc.ca/fnp/Main/Search/FNRegPopulation.aspx?BAND_NUMBER=648&lang=eng. Accessed March 31, 2022.

[313] Snuneymuxw First Nation. 2013. Coast Salish Culture. https://www.snuneymuxw.ca/nation/culture/coast-salish-culture. Accessed March 2022.

and accessed marine resources[314]. Within Snuneymuxw First Nation's territory on the Fraser River, there was a village site near the confluence of the Pitt and Fraser Rivers east of Barnston Island, as well as seasonal villages on Lulu Island[315] and Fort Langley. Snuneymuxw First Nation has identified that it has several inter-tribal relations with other First Nations in the Fraser River area but also asserts it had exclusive and documented village and field sites at the time of Crown sovereignty and as documented in the archival records. While the EAO considers that these sites do not directly overlap with the footprint of TMJ, Snuneymuxw First Nation has noted the relevance to its past, present, and future use of Fraser River surrounding TMJ site and cumulative effects considerations. For more information regarding Snuneymuxw First Nation's interests in the Fraser River please see Section 14.10.2 below.

Snuneymuxw First Nation are descendants of the Sarlequun Tribe, which on December 23, 1854, signed the Sarlequun Snuneymuxw Treaty of 1854 ("Treaty of 1854") at *Xwsolexwel* (Nanaimo harbour) [316]. The Treaty of 1854 is a trade and commerce treaty, that protects, forever and always, Snuneymuxw First Nation's enclosed fields, sacred villages, marine areas, harvesting and gathering, and the rights to hunt and fisheries as formerly[317]. Snuneymuxw First Nation has communicated to EAO that the Crown has consistently broken Treaty promises, starting with failing to survey Snuneymuxw territory and marine areas to be preserved and protected for Snuneymuxw People, leading to the unlawful sale of Snuneymuxw territory and marine areas to third parties without the consent of Snuneymuxw First Nation.

Snuneymuxw First Nation has told the EAO that the Crown obligations flowing from the Treaty of 1854 were not discharged honourably, and that the Crown made promises to survey and protect Snuneymuxw territory, and to protect villages, fields and fishing areas, but actions were not taken to implement that commitment. Much of the traditional territory and marine areas

[314] Snuneymuxw First Nation. Notice of Intent Participating Nation – Tilbury Phase 2 LNG. November 2021. https://projects.eao.gov.bc.ca/api/public/document/61ae476b751d220022f86f5c/download/SNUNEY~1.PDF

[315] Snuneymuxw First Nation SOI. 1993. BC Treaty Commission https://www.bctreaty.ca/sites/default/files/snuneymuxw.pdf. Accessed March 30, 2022.

[316] BC Archives, MS-772.

[317] Vogt, David. July 31, 2022. Snuneymuxw First Nation and the Lower Fraser River - Memorandum on Historical and Ethnographic Sources. Noting 1) Prepared in consideration of the proposed Tilbury Pacific Marine Jetty Project in support of negotiations and discussions with EAO and other parties; and 2) covered by negotiation privilege.

has been alienated to settlers by the Crown[314]. The EAO understands that Snuneymuxw First Nation views their Aboriginal Interests (including Treaty of 1854 rights and title) as inclusive of rights to self-governance, stewardship of Snuneymuxw First Nation's villages, fisheries, harvesting, and sacred sites, lands, waters, and resources, the intergenerational transmission of Hul'q'umin'um' and culture, and the protection of Snuneymuxw First Nation's cultural sites and spaces that relate to sense of identity and place[314]. Snuneymuxw First Nation also identified to the EAO that it is vital for there to be opportunity for Snuneymuxw First Nation to identify potential impacts to their Section 35 rights, as well as potential mitigation measures[314]. Snuneymuxw First Nation told the EAO that Snuneymuxw First Nation's rights and title are determined by Snuneymuxw people, and consent to impacts to Snuneymuxw First Nation's rights and title can only be given by Snuneymuxw First Nation[314].

Snuneymuxw First Nation is currently in stage 4 (Agreement-in-Principle negotiations) of the six stage BC Treaty process (BCTC) and has declined to participate in that process approximately six years ago because the process at that time worked to attempt to extinguish the Treaty of 1854 which Snuneymuxw First Nation views as one of the strongest pre-confederate treaties of Canada. Snuneymuxw First Nation has entered into multiple Nation-to-Nation agreements with the Government of Canada and Government-to-Government agreements with the Province of BC to confirm and implement Snuneymuxw First Nation's Treaty and Aboriginal rights, and to guide all deliberations, relations and decision-making. Recently, Snuneymuxw First Nation has re-engaged the BC Treaty Commission to support treaty implementation of the Treaty of 1854 through constructive arrangements or agreements pursuant to the BCTC rights-recognition policy.

In 2013 Snuneymuxw First Nation entered a *Reconciliation Agreement* with British Columbia[318], which was followed in 2020 by the phase 2 *Reconciliation Implementation Framework Agreement*[319]. In order to advance reconciliation, one of the purposes of the 2020 Framework Agreement was to set out provisions to establish a vision and framework for deepening the relationship between the parties that reflects the recognition and implementation of

[318] Snuneymuxw First Nation Reconciliation Agreement. 2013. https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/consulting-with-first-nations/agreements/snuneymuxw_reconciliation_agreement.pdf.

[319] Snuneymuxw First Nation and British Columbia Reconciliation Implementation Framework Agreement. 2020. https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/consulting-with-first-nations/agreements/snuneymuxw_first_nation_framework_agreement.pdf.

Snuneymuxw First Nation's Section 35 Rights, the *Draft Principles Guiding the Province of British Columbia's Relationship with Indigenous Peoples*[320], and *the United Nations Declaration on the Rights of Indigenous Peoples* in a manner consistent with the *Declaration on the Rights of Indigenous Peoples Act* (*DRIPA*)*, 2021*. The same agreement also outlines several areas for future negotiations, including one priority for the Province and Snuneymuxw First Nation to explore ways to make progress to support Snuneymuxw First Nation's right to self government, including exploring negotiating and agreeing on agreements that would establish joint or consent-based decision-making in accordance with Section 7 of *DRIPA*. Most recently in 2021, Snuneymuxw First Nation, Canada, and the Province of BC have signed a tripartite Memorandum of Understanding to build a mutually respectful and shared vision and establish a framework and process to advance reconciliation across several key topics[321]. In addition to a higher standard to be expected for relations and reconciliation, it is the view of Snuneymuxw First Nation that the bilateral and trilateral agreements provide direction that the free, prior and informed consent of Snuneymuxw is necessary prior to any developments or activities in their traditional territories and marine areas. The provincial crown understands that the agreements commit the parties to discuss these matters in future negotiations.

Currently, Snuneymuxw First Nation wholly owns Petroglyph Development Group, a group of companies that have diverse operations across several sectors including natural resources, marine transportation, real estate, hospitality, and tourism. They have several commercial fisheries operations, a new gas station and retail cannabis store, and a community convenience store. Snuneymuxw First Nation is engaged in several rights and title initiatives including partnerships in projects such as Sandstone, Conqora Capital Partners, Global Remediation Technologies, Seaspan Ferries, the Marriot Hotel, and others.

14.9.2 SNUNEYMUXW FIRST NATION'S INTERESTS ON THE FRASER RIVER

During the EA for TMJ, Snuneymuxw First Nation provided the EAO with a memorandum entitled: "Snuneymuxw First Nation and the lower Fraser River, Memorandum on Historical and

[320]Draft principles that guide the province of British Columbia's relationship with Indigenous peoples. 2018. https://www2.gov.bc.ca/assets/gov/careers/about-the-bc-public-service/diversity-inclusion-respect/draft_principles.pdf.

[321] Snuneymuxw First Nation, Canada, and British Columbia – Memorandum of Understanding. June 2021. https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/consulting-with-first-nations/agreements/snuneymuxw_tripartite_mou_final_-_signed_by_all_july_28_2021.pdf

Ethnographic Sources", which was prepared in consideration of TMJ, and covered by negotiation privilege[317]. The information provided in the following section below is in alignment with Snuneymuxw First Nation's submission and has been reviewed and approved by Snuneymuxw First Nation for inclusion in this Report.

Historically Snuneymuxw First Nation travelled to and from the Fraser River by canoe, to occupy village sites and/or camping sites along the Fraser River, including at Langley, Lulu Island, the mouth of the Pitt River, and upriver from Langley in the vicinity of Chilliwack or the lower Fraser Canyon. Snuneymuxw First Nation harvested Fraser River sockeye salmon, and (in alternating years) humpbacked salmon (i.e., pink salmon) over the summer months (i.e., July and August)[322,323]. It is also likely that Snuneymuxw harvested other fisheries resources from the Fraser River and nearby offshore areas, including sturgeon and halibut for example. Also, starting in September, cranberries were harvested in bogs at the mouths of small tributaries to the Fraser River, and Wapato was harvested over several weeks in late September into early October, especially at the fork of the Pitt River[322]. By mid-October Snuneymuxw First Nation families made their return across the Strait of Georgia in time for the Nanaimo River chum salmon run that occurs throughout October and November[322].

During the winter months Snuneymuxw families moved to their permanent winter villages at Stlilnup (Departure Bay), Nanaimo Harbour and False Narrows[313,322]. Over the winter months Snuneymuxw families depended upon stored foods until the early spring herring run returned in March[322]. Later in the spring, Snuneymuxw First Nation families moved to various locations in the Gulf Islands, including Gabriola Island, and Mudge Island to fish for salmon, cod, and other marine fish[322].

Throughout the year Snuneymuxw traditionally harvested shellfish, plants (e.g., berries, roots, bulbs, fruits, green leaves, and seaweeds), hunted and snared black ducks and

[322] Snuneymuxw First Nation. 2013. Traditional Economy. https://www.snuneymuxw.ca/nation/economy/traditional-economy. Accessed March 2022.

[323] Snuneymuxw First Nation. 2018. A96461-3 2018-12-05 Snuneymuxw Written Evidence - A6L6R7. TMX Reconsideration. Please note that the EAO acknowledges that Snuneymuxw First Nation's participation in the TMX reconsideration process was not comprehensive and did not involve extensive documentation and assessment of Snuneymuxw First Nation's rights and interests in the Salish Sea. Please note that information was not collected in relation to TMJ, and such care must be taken in applying it to the current regulatory context; and 2) Snuneymuxw First Nation's data collection for the TMX reconsideration process was limited and does not provide a full picture Snuneymuxw First Nation's Treaty and Aboriginal rights, use and concerns in the Salish Sea.

waterfowl, as well as, trapped smaller animals, hunted deer and elk in the spring and fall, and to a lesser extent harvested seals and sea lions[322]. Snuneymuxw First Nation occupied some areas where resources were shared between Indigenous Groups, including with mainland Halkomelem-speaking Indigenous Groups that may have an interest in the former village site east of Barnston Island, and other sites on the lower Fraser River[315]. While on the Fraser River, Snuneymuxw First Nation also engaged in commerce with white traders and with other First Nations.

14.9.3 SNUNEYMUXW FIRST NATION'S INVOLVEMENT IN THE CONSULTATION PROCESS

The EAO's approach to consultation with Snuneymuxw First Nation recognizes Snuneymuxw First Nation's Treaty Rights under the Treaty of 1854, recognized, and affirmed by Section 35 of the *Constitution Act*, *1982*. The EAO heard from Snuneymuxw First Nation that in their view, immediately following the signing of the Treaty of 1854, the Crown unlawfully took away or disposed of Snuneymuxw First Nation's lands, waters, and resources without their consent, neglecting to take the necessary steps required to honour the Crown's constitutional obligations under the Treaty. The EAO is aware of Snuneymuxw First Nation's ongoing reconciliation efforts with federal and provincial crowns in relation to lands, resources, and impacts of developments within Snuneymuxw First Nation's territory.

The EAO became aware of Snuneymuxw First Nation's interests in the Lower Mainland and the Fraser River through Snuneymuxw First Nation's expression of interest in the Pattullo Bridge Replacement Project in July 2020[324]. Since that time, the EAO has approached consultation with Snuneymuxw First Nation holistically by engaging across projects in the Lower Mainland and the Fraser River to understand Snuneymuxw First Nation's interests and determine where those interests lie to inform project-specific engagement. The EAO's approach was intended to inform Snuneymuxw First Nation of the various projects, create opportunities to identify concerns, and gauge Snuneymuxw First Nation's interest in participating in EA processes with an intent to tailor deeper engagement from there. Simultaneously during this time, Snuneymuxw First Nation and the Ministry of Indigenous Relations and Reconciliation (MIRR)

[324] Snuneymuxw First Nation. Notice of Intent Participating Indigenous Nation – Pattullo Bridge Replacement Amendment. April 2021. https://www.projects.eao.gov.bc.ca/api/public/document/60b55bae3f4d690022ef64afownloadFN%20LTR%20EAO%20SFN%20as%20a%20participating%20Nation%20in%20PBRP%20April292021.pdf

worked together to confirm details of Snuneymuxw First Nation's consultation area in the lower Fraser River, including the TMJ project area. Snuneymuxw First Nation's consultation area was updated in the Province's Profiles of Indigenous Peoples Database in July 2021.

On November 19, 2020, the EAO notified Snuneymuxw First Nation of the proposed TMJ project, which would be located within Snuneymuxw First Nation's traditional territory and marine areas, expanded consultation area and provided an update on the EA assessment process for TMJ. The EAO followed up with another letter on December 3, 2020, that provided a summary of all major projects either in pre-application stage or currently undergoing application review in the Lower Mainland, including TMJ. In that letter, the EAO offered for Snuneymuxw First Nation to meet with the EAO to discuss the nature and scope of Snuneymuxw First Nation's assertion in the region.

Snuneymuxw First Nation has identified that its participation and involvement in the EA process for TMJ was impacted by COVID-19, closures, and public health measures, and therefore, the timeframe for response from Snuneymuxw have been impacted by pandemic restrictions. The EAO also heard from Snuneymuxw First Nation that capacity was, and is, a continuing issue and that Snuneymuxw First Nation is of the view that throughout its engagement with the EAO on this, and six other projects, Snuneymuxw First Nation has had to hire outside consultants, largely at its own expense, to support its participation in the EA for TMJ. Snuneymuxw First Nation had identified that it takes issue with the recounting of engagement efforts that do not acknowledge this disparity.

On February 25, 2021, the EAO and Snuneymuxw First Nation met; during the meeting Snuneymuxw First Nation introduced the meeting participants to Snuneymuxw First Nation's history and interests in the Lower Mainland and the Fraser River and the participants discussed Snuneymuxw First Nation's interests with respect to projects either in pre-application stages or currently undergoing application review. The EAO reached out to Snuneymuxw First Nation following the meeting to identify if there was an interest to meet and further discuss the EAO's approach to consultation for the EA for TMJ, and or potential impacts from TMJ to Snuneymuxw First Nation's rights and interests. On August 4, 2021, the EAO notified Snuneymuxw First Nation of the upcoming comment period from August 5 to September 7, 2021, on the EAO's draft referral materials for TMJ. Snuneymuxw First Nation identified that the EAO had "only as of late" made clear attempts to engage with Snuneymuxw specifically on TMJ and that this late engagement meant that Snuneymuxw First Nation has been unable to fully review and participate in the EA process for TMJ. During the comment period, Snuneymuxw First Nation requested that the EAO extend the comment period until September

15, 2021, to allow Snuneymuxw First Nation to submit comments. While the EAO did not extend the public comment period, in response to Snuneymuxw First Nation's request the EAO was open to receiving comments directly from Snuneymuxw First Nation by the September 15, 2021, deadline.

In a letter to the EAO dated September 15, 2021, Snuneymuxw First Nation expressed that Snuneymuxw First Nation's consent is a requirement for TMJ, and that Snuneymuxw First Nation expects to continue working with the EAO and the province to ensure a thorough assessment of impacts to Snuneymuxw First Nation's rights and title is prioritized prior to a decision on TMJ, including proper engagement with TJLP. Along with this letter, Snuneymuxw First Nation also submitted comments on both the EAO's draft Assessment Report and proposed provincial and federal conditions for TMJ, including identifying that the EA did not include an assessment of impacts to Snuneymuxw First Nation's rights and interests, including rights under the Treaty of 1854. Snuneymuxw First Nation requested that the process for TMJ be amended to include Snuneymuxw First Nation as an impacted group.

On November 18, 2021, the EAO responded to Snuneymuxw First Nation, identifying that due to the advanced stage of TMJ's review the EAO was currently limited, but the EAO would strive to understand and mitigate potential TMJ-related impacts on Snuneymuxw First Nation's Aboriginal Interests and Treaty rights where possible to do so. The EAO also committed to continue consulting with Snuneymuxw First Nation should any additional analysis be undertaken for TMJ prior to referral.

Then on November 25, 2021, the EAO shared with Snuneymuxw First Nation a copy of TJLP's letter to the EAO, which described recent developments in the LNG bunkering/ bunker vessel markets and implications for the TMJ EA timeline. Also in this letter, the EAO offered Snuneymuxw First Nation to identify their interests in being added to the Schedule B Indigenous Groups listed in the Section 11 Order for TJLP's BVSA-related analysis to be undertaken for TMJ prior to referral. On December 2, 2021, the EAO approved a *Section 24(4) Order* to extend the review period for TMJ to allow for TJLP to conduct the analysis for the BVSA Report. On December 13, 2021, Snuneymuxw requested that the EAO include Snuneymuxw First Nation as a Schedule B Indigenous Group for the EA of TMJ, since the extension provided time and opportunity for Snuneymuxw First Nation's fulsome participation in the assessment for the BVS. Subsequently on January 19, 2022, the EAO added Snuneymuxw First Nation to the list of Schedule B Indigenous Groups for participation in BVSA-related

assessment, pursuant to Schedule 13 Order[325] amending the original Schedule 11 Order for TMJ.

As part of the review of TJLP's draft BVSA Report, Snuneymuxw First Nation was invited to participate in a series of five working group meetings hosted by the EAO. Of these Snuneymuxw First Nation attended the working group meeting on TJLP's Bunkering Vessel Scenario Report approach and methods (January 27/28, 2022); the focused working group meeting on Air Quality (April 4, 2022); and the Vancouver Fraser Port Authority's LNG Bunker Vessel Presentation (April 12, 2022). During review of TJLP's BVSA Report, the EAO met with Snuneymuxw First Nation on April 7, 2022, to discuss the preferred approach to consultation for the duration of the EA for TMJ. The EAO and Snuneymuxw First Nation agreed to engage in an iterative review of the EAO's referral materials. The Agency provided capacity in the form of a one-time grant to facilitate Snuneymuxw First Nation's continued participation in the TMJ EA, including identification of respective Aboriginal interests that may be adversely affected by TMJ under the BVS and measures to avoid, mitigate, or otherwise address or accommodate potential adverse impacts on Aboriginal interests, as appropriate. The EAO also provided capacity funding to support Snuneymuxw First Nation's participation in review of TJLP's BVSA Report, and the EAO's draft referral materials for TMJ. The EAO understands that during the review of the draft BVSA Report, TJLP provided a limited amount of capacity funding to support Snuneymuxw First Nation's participation, including review of the draft BVSA Report, and participation in EAO-led working group meetings.

As part of Snuneymuxw First Nation's participation in the assessment of TJLP's BVSA Report, Snuneymuxw First Nation provided comments on May 17, 2022, which included two primary concerns: 1) "Late Engagement" limiting Snuneymuxw First Nation's ability to comment on the MSA component of the EA for TMJ; and 2) "Bolstering Other Vessel Characteristics to Minimize Significance of Increase Bunker Vessel Frequency". Snuneymuxw First Nation was added to the list of Schedule B Indigenous Groups for TMJ in January 2021, and under the "Late Engagement" category, raised concern that Snuneymuxw First Nation was initially excluded from fulsome participation in the original EAC Application, and has only been consulted by the EAO at the end of the assessment process for TMJ. In addition to being added later to the Schedule B list of Indigenous Groups for TMJ by the EAO, Snuneymuxw First Nation also

[325]BC Environmental Assessment Office. Order Under Section 13 Amending Section 11 Order. Issued January 19, 2022. https://www.projects.eao.gov.bc.ca/api/public/document/61e862476fee890022086418/download/TMJ_Section13Order%235_VaryingTheProceduralOrderfortheEA_20220119.pdf.

expressed that due to TJLP's restrictive timelines on the development of the BVSA Report and the provisions of minimal capacity funding, Snuneymuxw First Nation was not provided the opportunity to complete an assessment of potential TMJ-related impacts on Snuneymuxw First Nation's Aboriginal Interests. Snuneymuxw First Nation consider that none of the information in TJLP's BVSA Report represented Snuneymuxw First Nation's knowledge and concerns. Snuneymuxw First Nation also raised the concern that Snuneymuxw First Nation was not provided an opportunity to identify impacts on Snuneymuxw First Nation's Section 35 rights and interests due to TMJ-related marine shipping, resulting in significant gaps in understanding for TMJ.

With respect to Snuneymuxw First Nation's views that TJLP's BVSA Report bolstered bunker vessel characteristics to minimize TMJ-related effects under the BVS. The EAO understands that Snuneymuxw First Nation views that the approach used in the BVSA Report to weigh the characteristics of the new bunker vessels against the increased frequency of bunker vessels calls to minimize the significance of potential additional effects under the BVS was faulty. The EAO heard from Snuneymuxw First Nation that in their view TJLP's approach was limited by the ability to determine the validity of TJLP's assumptions. Snuneymuxw First Nation identified this approach was especially problematic for some VC, including Visual Quality, Current Use of Lands and Resources for Traditional Purposes, and Accidents and Malfunctions. The EAO understands, that Snuneymuxw First Nation has experienced that the frequency of vessel interruption is more invasive and disturbing to the exercise of harvesting rights than is the size of the interrupting vessel. In response to Snuneymuxw First Nation's submission, the EAO followed up with TJLP for additional information about the consideration of vessel characteristics for the purposes of the BVSA Report. Also based on the feedback provided by Snuneymuxw First Nation, the EAO updated the referral materials to reflect the views of Snuneymuxw First Nation.

The EAO understands that Snuneymuxw First Nation consider there are information-related gaps associated TJLP's BVSA Report because Snuneymuxw First Nation did not participate in the earlier phases, which included a process for other Indigenous Groups to undertake knowledge and use studies, the review of TJLP's EAC Application and the MSA. The EAO also heard from Snuneymuxw First Nation that the process and timelines associated with EA for TMJ, including the review of TJLP's BVSA Report, did not permit Snuneymuxw First Nation to undertake a knowledge and use study to understand the potential impacts from TMJ to Snuneymuxw First Nation's current use and Aboriginal Interests. TJLP identified that it provided Snuneymuxw First Nation with capacity funding to support ongoing engagement on the BVSA, as well as indicated an ongoing offer to fund a traditional use study.

In its review of the EAO's draft assessment report, Snuneymuxw First Nation raised a concern that the EAO relied on publicly available data from the TMX and RBT2 assessments to assess impacts to Aboriginal Interests. Snuneymuxw First Nation did not participate in the RBT2 assessment and identified that the information provided by Snuneymuxw First Nation for the TMX assessment (i.e., written evidence for the NEB hearing in 2016; and comments on the TMX reconsideration in 2018) was not specific to the project or the MSA and was collected several years prior. Snuneymuxw First Nation did not participate in the MSA review for TMJ, and Snuneymuxw First Nation requested that the assessment of the MSA used TMJ-specific data collected from Indigenous Groups, including Snuneymuxw First Nation. Snuneymuxw First Nation has stated that its participation in the TMX processes was not comprehensive and did not involve extensive documentation and assessment of Snuneymuxw First Nation's rights and interests in the Salish Sea. The EAO understands that the concerns raised by Snuneymuxw through the TMX processes may not necessarily reflect all concerns pertinent to TMJ; however, the EAO considers the TMX processes as recent EAs in the region that have considered marine shipping in the Salish Sea, and that information from these processes provide substantial baseline information on existing conditions along BC's south coast, and therefore, the EAO is of the opinion that the publicly available information provided by Snuneymuxw First Nation for the assessment of shipping effects in the Salish Sea is relevant to inform the assessment of TMJ shipping effects. Please see Section 13.2.1 for additional information related to the concerns raised by Indigenous Groups related to the EAO's reliance on publicly available information from RBT2 and TMX processes for the assessment of TMJ.

The EAO is of the view it has been responsive to Snuneymuxw First Nation's concerns regarding consultation and potential impacts of TMJ and has provided opportunities for dialogue and exchange since becoming aware of Snuneymuxw First Nation's interest in engaging on projects in the lower Fraser River. The EAO is of the view that it has approached consultation with Snuneymuxw First Nation at the deeper end of the spectrum, with the intent to identify potential impacts and consider ways to address any potential impacts to Aboriginal Interests that were identified by Snuneymuxw First Nation with respect to TMJ. The EAO considered Snuneymuxw First Nation's feedback provided on TJLP's BVSA Report, the EAO worked iteratively with Snuneymuxw First Nation to revise Part C in response to information and feedback provided on the EAO's draft referral materials, and the EAO endeavoured to reflect Snuneymuxw First Nation's concerns and perspectives related to potential impacts to Snuneymuxw First Nation's Aboriginal Interests due to TMJ and the consultation process in Part C of this Assessment Report.

The EAO understands, that while Snuneymuxw First Nation acknowledges improvements in the EAO's approach to consultation, Snuneymuxw First Nation remains concerned with the EAO's views presented directly above. The EAO acknowledges that Snuneymuxw First Nation does not feel that the EAO's approach to consultation has been comprehensive for the EA of TMJ. Snuneymuxw First Nation views that the lack of appropriate capacity and/or timelines which facilitate Snuneymuxw First Nation's meaningful participation means that Snuneymuxw First Nation has consistently racing to catch up in this process. Snuneymuxw First Nation also consider that acknowledgement by the EAO of Snuneymuxw First Nation's interest in this project does not mean the same as provision of capacity and direction to the proponent to incorporate Snuneymuxw First Nation VCs in the assessment and/or work with Snuneymuxw First Nation to assess potential impacts. Snuneymuxw First Nation emphasized that it must also be afforded the time to develop their capacity. .

At the end of the EA process, Snuneymuxw First Nation provided a separate submission for TMJ that states Snuneymuxw First Nation does not consent to TMJ progressing forward unless ministers require the EAO and TJLP to work with Snuneymuxw First Nation to address its outstanding concerns regarding the EAO's consultation process for TMJ. The EAO included Snuneymuxw First Nation's separate submission in the referral package for decision makers at time of referral.

14.9.4 POTENTIAL IMPACTS TO ABORIGINAL INTERESTS

The following sections focus on the potential impacts of TMJ to Snuneymuxw First Nation's Treaty Rights under the Treaty of 1854, recognized, and affirmed by Section 35 of the *Constitution Act, 1982*. In its assessment of the potential impacts to Snuneymuxw First Nation's Aboriginal Interests (including considering ways to address any potential impacts), the EAO considered information relevant to the assessment of TMJ from public sources, as well as relevant issues raised by Snuneymuxw First Nation during the EA process for TMJ. The EAO understands that Snuneymuxw First Nation consider it is critical to understand the conditions necessary for the exercise of rights and the preferences of Snuneymuxw First Nation's members in the exercise of those rights in the assessment of effects.

The seasonal round, residential and cultural practices, spirituality and traditions, and relations with other First Nations are central features in understanding Snuneymuxw First Nation culture and traditional practices. Snuneymuxw First Nation states that Snuneymuxw People made an annual passage across the Salish Sea to reside at summer fishing villages on the Fraser River and conduct trade and commerce with newcomers or other First Nations. Snuneymuxw First Nation

report that harvesting camas, seals, salmon, including sockeye and (in alternating years) humpbacked salmon (i.e., pink salmon) over the summer months (i.e., July and August)[326,327]. Also, starting in September, cranberries were harvested in bogs at the mouths of small tributaries to the Fraser River, and Wapato was harvested over several weeks in late September into early October, especially at the fork of the Pitt River[322]. By mid-October Snuneymuxw First Nation families made their return across the Strait of Georgia in time for the Nanaimo River chum salmon run that occurs throughout October and November[322].

During the winter months Snuneymuxw families moved to their permanent winter villages at Stlilnup (Departure Bay), Nanaimo Harbour and False Narrows[313,322]. Over the winter months Snuneymuxw families depended upon stored foods until the early spring herring run returned in March[322]. Later in the spring, Snuneymuxw First Nation families moved to various locations in the Gulf Islands, including Gabriola Island, and Mudge Island to fish for salmon, cod, and other marine fish[322].

Throughout the year Snuneymuxw traditionally harvested shellfish, plants (e.g., berries, roots, bulbs, fruits, green leaves, and seaweeds), hunted and snared black ducks and waterfowl, as well as, trapped smaller animals, hunted deer and elk in the spring and fall, and to a lesser extent harvested seals and sea lions[322]. The EAO is aware that Snuneymuxw First Nation occupied some areas where resources were shared between Indigenous Groups, including with mainland Halkomelem-speaking Indigenous Groups that may have an interest in the former village site east of Barnston Island (approximately 30 km upstream of the TMJ site), and other sites on the lower Fraser River[315].

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[326] Snuneymuxw First Nation. 2013. Traditional Economy. https://www.snuneymuxw.ca/nation/economy/traditional-economy. Accessed March 2022.

[327] Snuneymuxw First Nation. 2018. A96461-3 2018-12-05 Snuneymuxw Written Evidence - A6L6R7. Reconsideration. Please note that the EAO acknowledges that Snuneymuxw First Nation's participation in the TMX reconsideration process was not comprehensive and did not involve extensive documentation and assessment of Snuneymuxw First Nation's rights and interests in the Salish Sea. Please note that information was not collected in relation to TMJ, and such care must be taken in applying it to the current regulatory context; and 2) Snuneymuxw First Nation's data collection for the TMX reconsideration process was limited and does not provide a full picture Snuneymuxw First Nation's Treaty and Aboriginal rights, use and concerns in the Salish Sea.[328] Government of Canada – Fraser River Indigenous fisheries. https://www.pac.dfo-mpo.gc.ca/fm-gp/fraser/abor-autoc-eng.html#lowerfraser (Accessed May 5, 2022).

A. POTENTIAL IMPACTS ON FISHING

Snuneymuxw First Nation consider the ocean and marine resources are of central significance to the Snuneymuxw First Nation way of life, including fish, shellfish, marine plants and marine mammals and migratory birds that provide Snuneymuxw First Nation people with spiritual, cultural, and physical sustenance[323]. Through the TMX reconsideration process, Snuneymuxw First Nation identified that members currently fish in the Salish Sea and the Nanaimo River, catching salmon of all species as well as several other types of fish, including halibut, herring, cod, rockfish and groundfish[323]. Snuneymuxw First Nation has identified they primarily harvest sockeye and halibut under FSC licenses, but also rely on commercial fisheries (i.e., prawn and Dungeness crab) and shellfish aquaculture as important fisheries-based economic developments[323].

- At the time of writing, it is the EAO's understanding that Snuneymuxw First Nation has not been approved by DFO to regularly harvest fish from the lower Fraser River for FSC purposes through DFO-issued communal harvesting opportunities at the present time[328,174]. Snuneymuxw First Nation has identified that it has the right to fish as formerly since 1854 and that it has been denied access to its fishing grounds by DFO for generations. Snuneymuxw First Nation has identified that DFO has knowledge of these rights and is aware that Snuneymuxw First Nation is not properly accommodated. Snuneymuxw First Nation have stated that it currently exercises its right to fish in the lower Fraser and have indicated that DFO is aware that Snuneymuxw First Nation currently fishes in the lower Fraser. Snuneymuxw First Nation have advised that, as such, the EAO's assessment lacks the proper consideration of impacts to Snuneymuxw First Nation's communal fishing rights, and Snuneymuxw views this as a violation of its Aboriginal and Treaty rights.

- The EAO understands that Snuneymuxw First Nation has consistently requested the Crown accommodate and support its interest in fishing in this area in the future along with other areas within their territory. Snuneymuxw views Canada as having not aligned their fishing access, licences, and policies sufficiently to align with and respect the rights of Snuneymuxw.

[328] Government of Canada – Fraser River Indigenous fisheries. https://www.pac.dfo-mpo.gc.ca/fm-gp/fraser/abor-autoc-eng.html#lowerfraser (Accessed May 5, 2022).

- As described in Section 13.3.1.1 of Part C of this Report, the EAO assessed for potential BVS-related impacts to Aboriginal fishing rights, base on TJLP's BVSA Report, and information provided by Indigenous Groups. In its re-evaluation for the BVS in Part C, the EAO used the same geographic scope as the Application (i.e., jetty to Sand Heads) based on TJLP's prediction that the BVS would not affect the number of vessels in the MSA (see Section 2.2.2 of Part A for more details). Consistent with the January 19, 2022, Section 13 Order for TMJ, the EAO is satisfied that its assessment for BVS-related impacts to biophysical components to fish quantity and quality, changes in access to fishing resources, and changes to social, cultural, and experiential values, which are provided in Section 13.3.1.1 of this Report, would largely apply to Snuneymuxw First Nation.
    - In its review of the EAO's draft Part C for TMJ, Snuneymuxw First Nation emphasized that it did not participate in the review of the MSA and that Snuneymuxw First Nation is not confident that the conclusions regarding the MSA and the BVS "largely apply to Snuneymuxw First Nation" and requested that Snuneymuxw First Nation's views be reflected in the EAO's materials. Snuneymuxw First Nation also requested that Snuneymuxw First Nation's information/baseline data be included so that a proper assessment of its inherent rights could be assessed against the project.

Also, in its review of the EAO's draft Part B for TMJ, Snuneymuxw First Nation identified that the EAO must assess TMJ-related impacts to Aboriginal Interests because of changes in air quality, and atmospheric noise, as these may impact accessibility to preferred harvesting areas representative of Snuneymuxw harvesters or impact the experiences and preferences of harvesters accessing sites, and that noise-sensitive land use receptors should also include receptors representative of Indigenous harvesters around the Project area.

- As described in Section 5.9 of the Part B of the Assessment Report (Wildlife and Wildlife Habitat and Marine Birds), TJLP's Application did not identify air quality effects as a major factor contributing to the decline or affecting the resilience of vegetation or wildlife subcomponents selected for TMJ. The EAO proposes Condition 19: Air Quality Management Plan and recommends a KMM under CEAA 2012 for an Air Quality Management Plan, which would include requirements for best management practices to mitigate effects to air quality.
- As described in the Part B chapter on Noise (Section 6.2), the EAO concludes that noise effects would be limited to construction and decommissioning of the marine jetty and

are anticipated to be most pronounced during pile driving. The EAO proposes several conditions to mitigate these effects, such as the lighting, noise, and vibration management components of the CEMP and OEMP, the Water Quality Management, Air Quality Management, and Greenhouse Gas Reduction Plans, which must be developed in consultation with Indigenous Groups.

The EAO understands that Snuneymuxw First Nation has treaty rights under the Treaty of 1854, and that the Crown has corresponding obligations. Snuneymuxw First Nation also has Aboriginal Interests specific to villages, land, and waters in the lower Fraser River. Through the TMX reconsideration process, Snuneymuxw First Nation identified that "the Salish Sea and the Fraser River are of vital importance to the Snuneymuxw people, and Snuneymuxw First Nation is dependent on the resources found in these waters for food, social, cultural, economic, and spiritual purposes"[323]. Snuneymuxw First Nation has identified that TMJ would fall within their territory, including fisheries areas and fishing villages and has the potential to affect these sites along with associated cultural activities, traditional uses, and access to water-based activities along the lower Fraser River[314]. Also, the EAO heard that Snuneymuxw First Nation's ability to maintain stewardship over the waters, participate in cultural activities and economic health of villages and marine areas, and Snuneymuxw First Nation's sense of identity are all deeply connected to Snuneymuxw First Nation's abilities to exercise their Section 35 rights (including Treaty of 1854 rights) to continue to fish in their preferred manner.

The EAO is also aware through the National Energy Board (NEB) review process for TMX, that Snuneymuxw First Nation have and continue to use the southern Salish Sea between Nanaimo and the Lower Mainland for fishing and transportation to its fisheries in the Fraser River since time immemorial and that Snuneymuxw First Nation views these activities as protected Section 35 rights under the Treaty of 1854[329,330]. Snuneymuxw First Nation identified concern from increased marine traffic within the shipping lanes should be explored through a comprehensive and updated baseline; Snuneymuxw First Nation also requested that any navigation studies or TERMPOL risk assessment relied on by Proponents should be updated to include information from Snuneymuxw First Nation, including tide conditions for shoreline harvesting, key information related to navigation, LNG release scenarios, and impact or potential infringements of Snuneymuxw First Nation's Aboriginal Rights. Through Snuneymuxw First Nation's submission on the TMX reconsideration, the EAO understands that Snuneymuxw First Nation is concerned that the ability to safely navigate the waters of its territory will be affected by increased vessel traffic, that Snuneymuxw First Nation members depend on safe transportation through the Salish Sea to access fishing and harvesting sites[323].

Snuneymuxw First Nation has also stated that they are experiencing 'intense' cumulative impacts from past and continued development, industrial use, and settler occupation of village sites, lands, and marine areas within their territory[314]. Snuneymuxw First Nation identify that Snuneymuxw First Nation did not grant consent for these activities, and the Crown's denial of rights, and Crown's actions that failed to protect rights, has led to an erosion of Snuneymuxw

[329] Snuneymuxw First Nation. 2015. C318-3-2 – Snuneymuxw response to Intervenor Requests – Issues tracking table – A4R4F7. https://apps.cer-rec.gc.ca/REGDOCS/File/Download/2797844. Accessed March 29, 2022. Please note that the EAO acknowledges that Snuneymuxw First Nation's participation in the TMX review process was not comprehensive and did not involve extensive documentation and assessment of Snuneymuxw First Nation's rights and interests in the Salish Sea. Please note that information was not collected in relation to TMJ, and such care must be taken in applying it to the current regulatory context; and 2) Snuneymuxw First Nation's data collection for the TMX reconsideration process was limited and does not provide a full picture Snuneymuxw First Nation's Treaty and Aboriginal rights, use and concerns in the Salish Sea.

[330] Snuneymuxw First Nation. 2014. C318-0-1 – Snuneymuxw application to participate – A3U5R3. https://apps.cer-rec.gc.ca/REGDOCS/File/Download/2418855. Accessed March 29, 2022. Please note that the EAO acknowledges that Snuneymuxw First Nation's participation in the TMX review process was not comprehensive and did not involve extensive documentation and assessment of Snuneymuxw First Nation's rights and interests in the Salish Sea. Please note that information was not collected in relation to TMJ, and such care must be taken in applying it to the current regulatory context; and 2) Snuneymuxw First Nation's data collection for the TMX reconsideration process was limited and does not provide a full picture Snuneymuxw First Nation's Treaty and Aboriginal rights, use and concerns in the Salish Sea.

First Nation's territory and infringements of their Section 35 rights and interests (including their Treaty of 1854 rights)[314]. The EAO understands that Snuneymuxw First Nation considers it vital to be provided the opportunity to identify impacts to its interests and speak to the ways in which changes to fishing sites and villages, as well as changes to fish populations, habitat, and behaviour will affect their ability to exercise their rights in their preferred manner around the TMJ project area. The EAO understands that Snuneymuxw First Nation also consider it equally as important to be provided the opportunity to identify mitigating measures to potential adverse cultural impacts.

- Within the scope of the TMJ BVS, the EAO considered Snuneymuxw First Nation's perspectives on TMJ's potential effects to Snuneymuxw First Nation's Aboriginal Interests, including concerns about existing cumulative impacts to village sites, lands, and marine areas within Snuneymuxw First Nation's territory. The EAO acknowledges that Snuneymuxw First Nation views that much of their traditional territory has been alienated to settlers by the Crown, including historic villages and fields, fishing stations and access to marine resources in the Fraser River.

Snuneymuxw First Nation have expressed to the EAO that there is uncertainty associated with Snuneymuxw First Nation's preferred resources, locations, means of exercising right, and tolerance thresholds to participating in activities affected by increased marine traffic and construction and operation activities, which would require having an opportunity to conduct a current use study specifically for TMJ.

- The EAO acknowledges the lower Fraser River area is highly industrial, the TMJ site is previously disturbed, and that there are already vessels transiting the lower Fraser River which can impact Indigenous fishers' ability to access, and quality of experience, for the fishing component of Current Use. The EAO recognizes there is some uncertainty when considering how cumulative effects impact Aboriginal Interests, and the EAO agrees with Snuneymuxw First Nation that when combined with past, present, and reasonably foreseeable activities, such cumulative effects would be more serious.

- In the Current Use chapter (Section 11.4) of this Report, the EAO acknowledges that marine users would continually avoid entering and remaining in the marine terminal area due to the warning signs and notifications regarding elevated public risk, especially when vessels would be berthing, loading, or de-berthing at TMJ. The EAO also concludes in the Land and Marine Use chapter of this Report (Section 8.2), that under the BVS, TMJ-related vessel traffic would result in negligible to low magnitude residual effects to

access for marine users due to the regularly occurring (an average of one vessel calls per day under the BVS) vessel traffic movements. The EAO predicts that these residual effects would be likely to result in infrequent and short-duration interruptions to access for marine users.

- At time of writing, the EAO is of the understanding that Snuneymuxw First Nation does not regularly access the lower Fraser River through DFO-regulated FSC fisheries. Snuneymuxw First Nation identified that it is in the process of taking steps to be able to fish more regularly in the Fraser River in the future by applying for fishing licenses from DFO, but it has been denied access to its fishing grounds by the DFO for generations; however, should Snuneymuxw First Nation do so in the future, the EAO predicts that under the TMJ BVS, there would be potential for higher frequency of interaction between Indigenous Groups and TMJ-related vessels in the lower Fraser River during some specific FSC windows (see Section 11.4 on Current Use of Lands and Resources for Traditional Purposes in Part B). The EAO understands that Snuneymuxw First Nation consider that the frequency of vessel interruption is more invasive and disturbing to the exercise of harvesting rights than the size of the interrupting vessel.

- The EAO views that the KMM being recommending under *CEAA 2012* for a Marine Access and Transportation Plan would help to address and reduce the potential for future access disruptions to Snuneymuxw First Nation from TMJ-related vessel traffic in the lower Fraser River to Sand Heads. While the EAO is of the view that the potential TMJ BVS-related impacts on Snuneymuxw First Nation's Aboriginal fishing rights have been avoided, minimized, and accommodated to the extent possible for the purposes of the EA, the EAO also recognizes that there are outstanding impacts, in particular regarding cumulative effects, and these outstanding impacts are reflected in the EAO's conclusions.

14.9.4.1.1 Conclusion

In accordance with the January 19, 2022, Section 13 Order, the EAO considered the relevant potential residual and cumulative effects associated with the TMJ BVS in its assessment for impacts to Snuneymuxw First Nation's Aboriginal fishing rights. Based on this assessment, the EAO predicts that the TMJ BVS alone would have a **minor** impact to Snuneymuxw First Nations right to fish. In consideration of the available information, the EAO's consultation with Snuneymuxw First Nation, Snuneymuxw First Nation's engagement with TJLP, TJLP's commitments, the EAO's proposed EAC conditions if an EAC is issued and the recommended

KMMs under CEAA 2012, the EAO concludes that the BVS-related effects from TMJ combined with cumulative effects is expected to result in a **minor-to-moderate** impact on Snuneymuxw First Nation's right to fish, if Snuneymuxw First Nation should engage regularly in DFO-licensed FSC fishing activities in the lower Fraser River in the future. The EAO predicts that the TMJ BVS would interact with current baseline-levels of cumulative effects that already have a combined negative impact to Snuneymuxw First Nation's access to fishing village sites and fisheries areas in the South arm of the lower Fraser River, as well as the experience of fishing in the lower Fraser River and to a lesser extent out to Sand Heads, should Snuneymuxw First Nation regularly access this area for fishing in the future. These cumulative effects are compounded by the importance of the lower Fraser River and Salish Sea to Snuneymuxw First Nation and that TMJ-related vessels would operate in a relatively heavily utilized marine environment, confined within the main navigational channel of the lower Fraser River and established shipping lanes, which increases the seriousness of impact on Snuneymuxw First Nations rights to fish.

While Snuneymuxw First Nation have indicated it agrees with the EAO's conclusions that cumulative effects are compounded by the importance of the lower Fraser River and the Salish Sea to Snuneymuxw First Nation, and high levels of pre-existing industrial use in the area, the EAO understands that Snuneymuxw First Nation considers that the frequency of vessel interruptions is more invasive and disturbing to the exercise of fishing rights than the size of the interrupting vessel, such that any additional disruptions, regardless of vessel size, will contribute to existing cumulative effects, leading to potential infringement of Snuneymuxw First Nation's Treaty rights. In its review of the EAO's draft referral materials, Snuneymuxw First Nation identified that Snuneymuxw authority over the right to fisheries as formally has not been accommodated, therefore, Snuneymuxw does not consent to TMJ.

The key factors that were considered in support of the EAO's conclusion on the impacts to Snuneymuxw First Nation's fishing rights are summarized as follows:

Biophysical:

- The EAO's conclusions in the Fish and Fish Habitat chapter in Part B that TMJ construction (just over three years in duration) and operations (annual dredging) are likely to result in low magnitude adverse residual effects to fish habitat and potential behavioural responses by fish species at the TMJ site, and low magnitude and frequency impacts to harm and mortality of sturgeon due to potential vessel strikes.
- The lower Fraser River is highly industrial and the TMJ site is previously disturbed, and this factor increases the seriousness of impact of TMJ on the right to fish.

Geospatial (places, sites and access):

- During construction, access to the TMJ site would be restricted for three years. During operations, Indigenous mariners and fishers would avoid entering and remaining in the marine terminal area due to the warning signs and notifications regarding elevated public risk, and particularly when vessels would be berthing, loading, or de-berthing at TMJ (on average, one vessel call or two vessel movements a day under the BVS). At the scale of the LAA and RAA this would amount to a low magnitude impact to access within the TMJ site.
- Effects to access from vessels in transit are predicted to be negligible to low in magnitude compared baseline levels due to regularly occurring and short-duration TMJ-related vessel transits to pass through the Fraser River to and from Sand Heads, with the magnitude of effect predicted to be higher in the Fraser River as a change from baseline, compared to out to Sand Heads.
- Snuneymuxw First Nation do not consider that effects to access from TMJ-related vessel traffic will be negligible to low and predict the potential effects to be higher in the context of cumulative effects.
- Snuneymuxw First Nation have identified former village sites located near the confluence of the Pitt and Fraser Rivers east of Barnston Island, as well as one or more seasonal fishing camps on Lulu Island (located across the river from TMJ's proposed marine terminal area). Snuneymuxw First Nation have and continue to use the southern Salish Sea for fishing and transportation to its fisheries in the Fraser River.
- Snuneymuxw First Nation have indicated that the marine terminal area of TMJ is located within Snuneymuxw First Nation's fisheries area and has the potential to affect these areas, including disrupting access to seasonal fishing villages or water-based harvesting activities along the lower Fraser River.

Social, Cultural and Experiential:

- As outlined in the noise and visual quality assessments in Part B, potential negligible to low magnitude impacts due to a change in noise and visual quality during construction and to changes in visual quality during operations and potential concerns about safety during operations.

- At time of writing, the EAO is of the understanding that Snuneymuxw First Nation do not currently have access to regularly fish at the TMJ site location through DFO-regulated FSC fisheries openings. Snuneymuxw First Nation has identified that it has been denied access to its fishing grounds by DFO for generations. Snuneymuxw First Nation has also identified that it currently exercises its right to fish in the lower Fraser on the Lower Mainland, including near the TMJ site and have indicated that DFO is aware that Snuneymuxw First Nation currently fishes in the lower Fraser River. The EAO is aware that Snuneymuxw First Nation is in the process of taking steps to be able to fish more regularly in the area by applying to DFO for fishing licences
- Snuneymuxw First Nation have identified that there is uncertainty associated with Snuneymuxw First Nation's tolerance thresholds to participating in activities effected by increased marine traffic and construction and operation activities, which would require Snuneymuxw First Nation having an opportunity conduct a current use study for TMJ.
- Snuneymuxw First Nation have identified that their ability to maintain stewardship over the waters, participate in cultural activities, and Snuneymuxw First Nation's sense of identity are all deeply connected to Snuneymuxw First Nation's abilities to exercise their Section 35 rights.

Mitigations:

- Proposed mitigations for potential impacts to Snuneymuxw First Nation's fishing rights, include mitigations to reduce impacts to noise and visual quality in the CEMP and OEMP as well as the recommended KMMs under CEAA 2012, specifically the Fish Mitigations to Reduce Harm and Mortality, Fish Habitat and Offset Plan, Marine Communications Plan, Marine Access and Transportation Plan and Vessel Traffic Management Plan. These plans would identify the procedures of communication to Indigenous Groups and identification of mitigations to reduce potential disruptions for Indigenous harvesters and mariners to carry out traditional use activities including fishing for FSC purposes.
- Snuneymuxw First Nation indicated that it has not had the opportunity to collect information to include Snuneymuxw's comments on potential impacts/accommodation measures. For more information related to Snuneymuxw First Nation's involvement in the consultation process for TMJ, see Section 14.9.3 above.

B. POTENTIAL IMPACTS ON HUNTING, TRAPPING AND GATHERING

The EAO recognizes that Snuneymuxw First Nation has Treaty Rights to hunt as formerly under the Treaty of 1854, recognized, and affirmed by Section 35 of the *Constitution Act*, *1982.* The

EAO heard that Snuneymuxw First Nation's ability to maintain stewardship over the lands, participate in cultural activities, and Snuneymuxw First Nation's sense of identity are all deeply connected to Snuneymuxw First Nation's abilities to exercise their Section 35 rights (including Treaty of 1854 rights) to continue to hunt, gather, and access and use other land-based natural resources in their preferred manner.

When occupying their seasonal village and campsites located in the lower Fraser River, Snuneymuxw First Nation would harvest cranberries from tributaries to the Fraser River, and Wapato, especially at the fork of the Pitt River, over the fall months[324]. Throughout the year Snuneymuxw First Nation also harvested other plants, hunted, and snared waterfowl, trapped smaller animals, and hunted deer, elk, and marine mammals, including porpoise, seal, and sea lion[323]. In addition to sustenance, mammals and birds were used in the manufacture of tools, and for ritual and ceremonial purposes. Many plant species are known to have been used by the Coast Salish Indigenous Groups of Vancouver Island, including for food, technology, and for medicinal purposes[331]. Snuneymuxw First Nation has identified a significant marine, cultural, and spiritual connection to their seasonal use of Fraser River area, including multiple locations where Snuneymuxw First Nation held villages and fields, and accessed resources[314].

The EAO evaluated the potential effects on hunting, trapping, and gathering rights attributable to TMJ which apply broadly to Indigenous Groups. These potential effects are summarized in Section 13.3.2. The EAO is satisfied that the key impacts to biophysical components resulting in changes to wildlife and vegetation quantity and quality, changes in access to hunting, trapping, and gathering areas, and changes to social, cultural, and spiritual values associated with traditional hunting, trapping and gathering activities summarized in that section generally apply to Snuneymuxw First Nation.

14.9.4.1.2 Conclusion

In consideration of the available information, consultation Snuneymuxw First Nation, Snuneymuxw First Nation's engagement with TJLP, TJLP's commitments, the EAO's proposed EAC conditions if an EAC is issued and the recommended KMMs under CEAA 2012, TMJ is expected to result in a negligible impact on Snuneymuxw First Nation's right to hunt, trap and gather.

[331] Turner, Nancy Chapman and Marcus A.M. Bell. "The Ethnobotany of the Coast Salish Indians of Vancouver Island" in *Economic Botany,* Vol. 25 (1), 1971, pp. 70-2, 91-2.

The key factors that were considered in support of the EAO's conclusion on the impacts to the right to hunt, trap and gather are summarized as follows:

Biophysical:

- The EAO's conclusions at the TMJ site on adverse residual effects to Wildlife and Wildlife Habitat and Vegetation (see respective sections in Part B) indicate negligible to low magnitude residual effects on loss or alteration of wildlife habitat, sensory disturbance from noise and light, and mortality; as well as low magnitude residual effects on wetland and riparian ecosystems;
- The EAO's conclusions on adverse residual effects to Marine Birds (see Wildlife section in Part B) indicate negligible to low magnitude residual effects related to mortality;
- Snuneymuxw First Nation has identified that it does not consider that effects to Marine Birds will be negligible to low, and predict the potential effects to be higher in the
- context of cumulative effects;
- Terrestrial wildlife species of cultural importance to Snuneymuxw First Nation have either not been found within the TMJ site or are not anticipated to be affected by the project-related activities; and
- Snuneymuxw First Nation have identified that it has not provided information on terrestrial species of cultural importance to the EAO, the EAO cannot assess whether or not the species can be found on the TMJ site or whether or not they will be affected by project-related activities.

Geospatial (places, sites and access):

- Construction (just over three years in duration) and operation (30 years) is unlikely to cause disruptions to Snuneymuxw First Nation's access to areas traditionally used for hunting, trapping, and gathering activities at the TMJ site;
- Snuneymuxw First Nation have identified that it has not provided information on traditional use sites and the EAO cannot assess whether or the project will cause disruptions; and
- The upland portion of the TMJ site is situated on fee simple (private) land.

Social, Cultural and Experiential:

- Snuneymuxw First Nation do not currently harvest in the TMJ area but seek to re-establish traditional harvesting practices in the area;
- Snuneymuxw First Nation maintain that the Treaty of 1854 includes the right to hunting/trapping/gathering lands, and resources; and
- Potential impacts to experience in the vicinity of the TMJ site and along the shipping route due to a change in noise and visual quality, as described in Part B, during construction and operation which are anticipated to be negligible to low in magnitude in the Fraser River and Salish Sea out to Sand Heads.

Mitigations:

- Proposed conditions to mitigate impacts to Snuneymuxw First Nation's right to hunt are the vegetation and wetland management, wildlife and wildlife habitat management, light management, and noise management components of the CEMP and OEMP, all of which would require consultation with Indigenous Groups. The EAO is also proposing these mitigations as KMMs under CEAA 2012 which would include the requirements for vegetation and wetland creation and restoration, lighting, noise and wildlife and wildlife habitat management and monitoring; and
- All vessels would adhere to the Marine Regulations and Legislation regulating vessel noise and lighting.

In its review of the EAO's draft Assessment Report, Snuneymuxw First Nation indicated that it was not afforded the opportunity to provide information and does not have confidence that the assessment of impacts to hunting, trapping, and harvesting etc. "generally apply" to Snuneymuxw First Nation. Snuneymuxw First Nation also indicated that it had also not provided information on species of important cultural value, and have not identified harvesting sites. In Snuneymuxw First Nation's view the EAO cannot, therefore, substantiate any claims that the project will not impact Snuneymuxw First Nation's rights to hunt, trap and harvest.

C. POTENTIAL IMPACTS ON OTHER CULTURAL AND TRADITIONAL INTERESTS

Snuneymuxw First Nation have expressed that the ocean and marine resources are of central significance to the Snuneymuxw First Nation way of life, that in addition to providing physical sustenance, also provides Snuneymuxw First Nation people with spiritual, cultural sustenance[323]. The resource rich and productive ecosystems of the Salish Sea is important for Snuneymuxw First Nation people, and their culture is based on "a deep connection to our

land, waters, and all living things"[332]. Through the TMX reconsideration, Snuneymuxw First Nations further exemplified its deep connection to the marine resources by illustrating the special place of the killer whale in Snuneymuxw First Nation culture and spirituality[323]. To Snuneymuxw First Nation people, the whales can connect the spirit world, are often harbingers of significant events, and are featured in Snuneymuxw First Nation's oral traditions and stories[333,334].

The EAO understand that Snuneymuxw First Nation consider that stewardship of fishing villages, land, and waters found in the lower Fraser River important and that Snuneymuxw is dependent on the resources found in these waters of the lower Fraser River and the Salish Sea for food, social, cultural, economic, and spiritual purposes. Snuneymuxw First Nation have also expressed that within Snuneymuxw First Nation's Section 35 constitutional protections are the right to self-govern, to practice Snuneymuxw First Nation culture, to speak Hul'q'umin'um', and any right flowing from these aspects (e.g., passing on knowledge and language to the next generation, gathering needed resources to participate in ceremony)[323]. Through the TMX reconsideration process, Snuneymuxw First Nation have also identified that marine transportation holds cultural value to Snuneymuxw First Nation people, and Snuneymuxw First Nation relies on safe transportation through the Salish Sea.

The EAO acknowledges that Southern Resident Killer Whale are of great cultural and ecological importance to Snuneymuxw First Nation. As described in Section 13.3.3, the EAO provides a

[332] Snuneymuxw First Nation. 2013. Culture. https://www.snuneymuxw.ca/nation/culture. Accessed March 2022.

[333] Snuneymuxw First Nation. 2018. A96461-6 Appendix C - The Young Man and the Orca - A6L6S0. TMX Reconsideration. Please note that the EAO acknowledges that Snuneymuxw First Nation's participation in the TMX reconsideration process was not comprehensive and did not involve extensive documentation and assessment of Snuneymuxw First Nation's rights and interests in the Salish Sea. Please note that information was not collected in relation to TMJ, and such care must be taken in applying it to the current regulatory context; and 2) Snuneymuxw First Nation's data collection for the TMX reconsideration process was limited and does not provide a full picture Snuneymuxw First Nation's Treaty and Aboriginal rights, use and concerns in the Salish Sea.

[334] Snuneymuxw First Nation. 2018. A96461-7 Appendix D - The Boys Who Became a Killer Whale - A6L6S1.TMX Reconsideration. Please note that the EAO acknowledges that Snuneymuxw First Nation's participation in the TMX reconsideration process was not comprehensive and did not involve extensive documentation and assessment of Snuneymuxw First Nation's rights and interests in the Salish Sea. Please note that information was not collected in relation to TMJ, and such care must be taken in applying it to the current regulatory context; and 2) Snuneymuxw First Nation's data collection for the TMX reconsideration process was limited and does not provide a full picture Snuneymuxw First Nation's Treaty and Aboriginal rights, use and concerns in the Salish Sea.

detailed discussion of the BVS-related analysis and resolution of concerns related to the effects on other cultural and traditional interests, including cultural and spiritual interests related to whales. In the BVSA Report, TJLP assessed for potential effects to changes in abundance and distribution of marine mammals, including Southern Resident Killer Whale. The EAO is of the view that TJLP's approach to the BVSA Report was consistent with the methods applied in TJLP's 2019 Application with respect to marine mammals, which identified critical Southern Resident Killer Whale foraging habitat along the shipping route out to Sand Heads Lighthouse, within in the southeast Strait of Georgia (including near the mouth of the Fraser River)[335]. In the Part B chapter on Marine Mammals (Section 5.7), the EAO concluded that the TMJ BVS would not result in significant residual effects to marine mammals; however, the EAO notes that the current baseline of cumulative effects to Southern Resident Killer Whales is already high and that TMJ would contribute additional residual effects from shipping noise and potential avoidance behaviour by Southern Resident Killer Whales to ships, such that cumulative effects to Southern Resident Killer Whale are considered significant.

The EAO is recommending a KMM under CEAA 2012 for a Vessel Traffic Management Plan that would require TJLP to incorporate contractual measures to require participation of TMJ-related vessels in the VFPA-led ECHO Program seasonal slowdown initiatives (as amended) or a future equivalent and annual reporting on TJLP's participation in regional environmental management measures and cumulative effects monitoring to protect Southern Resident Killer Whale, where feasible. The seasonal slowdown initiatives currently request vessels to slow down in key Southern Resident Killer Whale foraging areas such as Swiftsure Banks, Haro Strait and Boundary Pass. The EAO notes several regional initiatives and measures have been implemented by the Government of Canada to better understand and manage cumulative effects on the recovery of Southern Resident Killer Whales (listed in Section 13.1.1). Snuneymuxw First Nation expressed that in their view the Government of Canada programs would have limited funding or opportunities for participation and were not designed to specifically mitigate impacts from TMJ. The EAO has also included Snuneymuxw First Nation's views on the Government of Canada programs in the Part C section on the EAO's Consideration of Existing Regional Government of Canada Initiatives (see Section 13.1.2).

[335] DFO. (2011c). Recovery Strategy for the Northern and Southern Resident Killer Whale (Orcinus orca) in Canada. Species at Risk Act Recovery Strategy Series, Fisheries and Oceans Canada, Ottawa, ix + 80 pp.

14.9.4.1.3 Conclusion

In accordance with the January 19, 2022, Section 13 Order, the EAO considered the relevant potential residual and cumulative effects associated with the TMJ BVS in its assessment for impacts to Snuneymuxw First Nation's other cultural and traditional interests. Based on this assessment, the EAO predicts that under the BVS, TMJ-related marine shipping effects alone would have minor impacts on Snuneymuxw First Nation's other cultural and traditional interests, although the EAO acknowledges that there is uncertainty in the relationship between incremental increases in shipping and the availability of cultural resources, such as Southern Resident Killer Whale. However, in consideration of the available information, the EAO's consultation with Snuneymuxw First Nation, Snuneymuxw First Nation's engagement with TJLP, TJLP's commitments and the EAO's proposed EAC conditions if an EAC is issued, and the recommended KMMs under CEAA 2012, the EAO concludes that the BVS-related impacts from TMJ combined with cumulative effects is expected to result in moderate-to-serious cumulative impact on Snuneymuxw First Nation's other traditional and cultural interests. The EAO's conclusions of significant cumulative effects to Southern Resident Killer Whale was a major key factor considered in the EAO's seriousness determination.

The EAO understands that Snuneymuxw First Nation does not have confidence in this assessment because Snuneymuxw First Nation information was not included in the assessment. Snuneymuxw First Nation views that minor impacts can and will contribute to substantial existing cumulative effects, leading to potential infringement of Snuneymuxw First Nation's Treaty rights.

The key factors that were considered in support of the EAO's conclusion on the impacts to other traditional and cultural interests are summarized as follows:

Cultural and Heritage Resources:

- The EAO's conclusions in Heritage Resources section of Part B found no residual effects to Heritage Resources (Section 7.1) from erosion due to wake effects along the shorelines of the Fraser River in the RAA;
- The EAO's conclusions in Part B section on Marine Mammals, which found low to moderate magnitude residual effects from TMJ-related vessels on Southern Resident Killer Whales and significant cumulative effects to Southern Resident Killer Whales due to underwater noise;
- Snuneymuxw First Nation have identified that it has not provided information on cultural and heritage resources, and that Snuneymuxw is not confident that they EAO's

assessment is fulsome; and

- The lower Fraser River and the Salish Sea out to Sand Heads is highly industrial and the TMJ site is previously disturbed. These factors increase the seriousness of impact of TMJ.

Geospatial (places, sites and access):

- The small number of TMJ-related vessels relative to current vessel traffic are predicted to have a negligible to low effect on cultural activities in terms of access disruptions due to regularly occurring (i.e., on average one vessel call per day under the BVS) and short-duration vessels movements to and from TMJ's marine terminal area, such that construction and operation are unlikely to cause disruptions to Snuneymuxw First Nation's access to cultural sites and uses in the Fraser River area;
- Snuneymuxw First Nation depends on safe transportation through the Salish Sea to access fishing and harvesting sites; and,
- During construction, access to the TMJ site would be restricted for three years. During operations, Indigenous mariners and fishers would avoid entering and remaining in the marine terminal area due to the warning signs and notifications regarding elevated public risk, in particular when vessels would be berthing, loading, or de-berthing at TMJ (on average, one vessel call or two vessel movements a day in the BVS).

Social, Cultural, Experiential:

- The EAO's conclusions in the Noise assessment in Part B found sensory disturbances from noise are anticipated to be negligible to low magnitude, temporary and short-term, including up to low magnitude noise effects during construction and decommissioning at the Indigenous village site on Lulu Island;
- The EAO's conclusions in the Visual Quality assessment in Part B found a negligible to low impact to the existing visual landscape character in the lower Fraser River;
- Potential negligible impacts from TMJ-related vessel traffic during operations affecting visual quality, noise and vessel wake (with an increasing magnitude of effect the closer one is to the vessels);
- Safe marine navigation between Snuneymuxw First Nation's villages and fishing areas holds cultural value for Snuneymuxw;
- Snuneymuxw First Nation maintain that the Treaty of 1854 includes rights to

intergenerational transmission of Hul'q'umin'um and culture, and the protection of cultural sites and spaces that relate to Snuneymuxw First Nation's sense of identity and place;

- Snuneymuxw First Nation have identified that it has not provided information on cultural and traditional interests, and that Snuneymuxw is not confident that they EAO's assessment is fulsome; and
- The high cultural importance of Southern Resident Killer Whales to Snuneymuxw First Nation.

Mitigations:

- Proposed provincial conditions to mitigate impacts to cultural heritage are the development of the Cultural and Archaeological Resources Management Plan for the TMJ site, the Lighting Management, Noise and Vibration Management and Air Quality Management as part of the CEMP and OEMP as well as the Water Quality Management Plan and the Indigenous Cultural Awareness and Recognition Condition;
- Heritage Conservation Act, (RSBC 1996, c. 182);
- Proposed mitigations for potential impacts to traditional and cultural interests are the recommended key mitigations under CEAA 2012 for a Marine Communications, and Vessel Traffic Management Plans, and a Marine Shipping Emergency Response Outreach Program; and
- Snuneymuxw First Nation indicated that it has not had the opportunity to collect information to include Snuneymuxw's comments on potential impacts/accommodation measures and does not have confidence that the assessment of impacts to cultural and traditional resources is fulsome.

D. POTENTIAL IMPACTS ON TITLE

The assessment of impacts to Aboriginal title was informed by the relevant information presented above and below. It is also informed by the EAO's assessment of effects to VCs that informed the discussion of impacts to vegetation, wildlife, fishing, hunting, trapping, and gathering, and other traditional and cultural interests.

Potential TMJ impacts on Snuneymuxw First Nation title are assessed below, including the following information:

- The EAO's conclusions on Current Use of Lands for Traditional Purposed in Part B of this

Report, that TMJ-related vessel transits would be regularly occurring (i.e., on average one vessel call per day under the BVS) and short-duration to pass through known fishing areas in the lower Fraser River and Salish Sea, which could cause negligible to low magnitude effects to access to fishing.

- TJLP has stated that TJLP's influence on TMJ-related vessel operations would be limited beyond TMJ's marine terminal area, but TJLP is committed to adjusting their shipping schedule when safe and feasible to do so in order to reduce the likelihood of TMJ-related vessels interrupting access for FSC openings in the lower Fraser River by Indigenous Groups that fish there, or for other traditional and cultural practices by Schedule B Indigenous Groups through the Marine Access and Transportation Plan.

Snuneymuxw First Nation has told the EAO that assessment of effects also means to consider information on Snuneymuxw First Nation's systems for self-governance and self-determination with respect to the management of those traditional lands, waters, and resources to ensure Snuneymuxw First Nation's law, customs and structures is appropriately contemplated. Snuneymuxw First Nation also identified that it considers that the EAO does not identify TMJ's potential to effect cultural and traditional use of lands, noting that the "upland portion" of the proposed Project is on fee simple lands. In preliminary feedback on the EAO's draft referral materials, Snuneymuxw First Nation told the EAO that, in addition to marine shipping and the construction and operation of the marine jetty, TMJ has the potential to affect the cultural and traditional use of lands via changes and/or interruption to access for land-based activities including Snuneymuxw First Nation villages, fishing, harvesting, and sacred sites. Snuneymuxw First Nation is of the view that the Crown must ensure that potential impacts to Snuneymuxw First Nation's Section 35 rights and interests (including Treaty of 1854 rights) as they connect to land-based rights and activities are identified, assessed, and accommodated prior to approving TMJ. In addition, Snuneymuxw First Nation expressed that further loss or alteration of wetlands and riparian ecosystems, changes to sediment processes because of dredging or marine traffic, and changes to ambient air quality all have the potential to impact land-based rights and activities including access to Snuneymuxw First Nation villages, fishing, harvesting, and sacred sites whose protection and stewardship are guaranteed under the Treaty of 1854.

14.9.4.1.4 Conclusion

In consideration of the available information, the EAO's consultation with Snuneymuxw First Nation, Snuneymuxw First Nation's engagement with TJLP, TJLP's commitments, the EAO's proposed EAC conditions if an EAC is issued, and recommended KMMs under CEAA 2012, TMJ is expected to result in a minor impact to Snuneymuxw First Nation's Aboriginal title.

The EAO understands that Snuneymuxw First Nation disagrees with this assessment because Snuneymuxw First Nation is of the view that it has not had the opportunity to provide evidence, set baseline, or inform thresholds, and as such Snuneymuxw First Nation considers that it is not possible for the EAO to assess impacts to access to fishing as "negligible to low". Furthermore, the ability for Snuneymuxw First Nation to determine future uses over its villages and marine areas is impacted. Snuneymuxw First Nation considers that TMJ is taking more of Snuneymuxw marine areas away, without accommodation, recourse, or redress. Snuneymuxw First Nation emphasizes that there is lack of consent for TMJ in Snuneymuxw territory and marine areas

The key factors that were considered in support of the EAO's conclusion on the impacts to Aboriginal title are summarized as follows:

Use and Occupation:

- The access restrictions to the area surrounding the jetty during construction would be limited in area (to a maximum of area of 23 ha during dredging over 50 days; and then a smaller area for work on the jetty thereafter);
- The EAO assumed that Indigenous mariners and fishers would avoid entering and remaining in the marine terminal area due to the warning signs and notifications regarding elevated public risk, in particular when vessels would be berthing, loading, or de-berthing at TMJ (on average, one vessel call or two vessel movements a day in the BVS).;
- The increase in vessel traffic along the Fraser River would be a small percentage increase from traffic already present; and
- As outlined in the noise and visual quality assessments in Part B, the EAO predicts TMJ would have the potential for short-term duration, negligible to low magnitude residual effects to the Noise and Visual Quality VCs during construction, and frequent (vessel-related) and continuous (jetty site-related) negligible to low effects on visual quality during operations. Also, the EAO predicts low magnitude noise effects at one or more seasonal fishing camps at Lulu Island to be short-term in duration.

Snuneymuxw First Nation have identified former village sites located near the confluence of the Pitt and Fraser Rivers east of Barnston Island, as well as one or more seasonal fishing camps on Lulu Island (located across the river from TMJ's proposed marine terminal area).

Control of Area:

- The area of development for the TMJ jetty is crown land (intertidal submerged); and

- The upland portion of TMJ is located on fee simple private land that are used for industrial purposes.
- Snuneymuxw First Nation maintain that the Treaty of 1854 includes rights to self-governance.
- Snuneymuxw First Nation have an interest in the former village site east of Barnston Island, and other sites on the lower Fraser River.

Economic Benefits:

- TMJ is located on private land already zoned and developed for industrial usage; and
- The construction and operation of the TMJ jetty and the vessel traffic to and from TMJ in the Fraser River is unlikely to affect Snuneymuxw First Nation's economic developments, including commercial fisheries operations.

Mitigations:

- Several conditions are proposed to mitigate impacts to Aboriginal title, including a condition for Indigenous Cultural Awareness and Recognition, Cultural and Archaeological Resource Management Plan, Indigenous Monitors, Engagement and Reporting, Indigenous Training, Employment and Procurement Plan, Water Quality Management Plan, and Indigenous Monitors. The EAO is also recommending Marine Access and Transportation and Marine Communication Plans as a KMM under CEAA 2012 to reduce impacts to access from construction and operations.

15.0 SCHEDULE C: IMPACTS TO ABORIGINAL INTERESTS BY INDIGENOUS GROUP

15.1 KATZIE FIRST NATION

15.1.1 COMMUNITY PROFILE

Katzie First Nation is a Central Coast Salish group culturally and linguistically associated with the Stó:lō; however, Katzie First Nation operates independently of the broader Stó:lō Nation in its legal and political representations. Katzie First Nation's ancestral language is the downriver dialect of *hən̓q̓əmin̓əm* (pronounced "Hul-ka-MEE-num"), and Katzie First Nation reports that they are among the most inland speakers of this "downriver" dialect of Mainland Halkomelem.

Katzie First Nation IR 1, on the north bank of the Fraser River, west of Port Hammond, and south of the town of Pitt Meadows, serves as administrative hub and one of three residential communities; the other two residential communities are located on Katzie IR 2 and Katzie IR 3. Katzie First Nation reserve lands are located on the south bank of the Fraser River, on the south shore of Barnston Island, at the lower end of Pitt Lake, and the Katzie First Nation cemetery south of Lougheed Highway. As of February 2022, of 634 registered Katzie First Nation members, 313 members live on reserve[336]. Katzie First Nation reports that their ancestors once lived across 10 villages throughout Katzie First Nation territory, but eventually congregated at the village of *q'e̲'ye'e̲y*, the site of Katzie IR1 today. This village features heavily in Katzie oral history. The only other Katzie First Nation village sites that are currently occupied are on Barnston Island IR3 and Katzie IR2 which are approximately 28 km upriver from the TMJ site.

Katzie First Nation is currently involved in advanced Treaty negotiations with the federal and provincial governments and is focused on an incremental approach to self-governance. Within this process Katzie First Nation has filed a Statement of Intent (SOI) identifying an area described as its traditional territory "extending south from the headwaters of the Pitt River to encompass Pitt Lake, Pitt Polder, a portion of the Fraser River, and south east to encompass the Nicomekl and Serpentine Rivers". TMJ area does not overlap any current or former Katzie First Nation reserve lands, although it does overlap the southwestern portion of Katzie First Nation's asserted traditional territory.

Katzie First Nation reported that it has Aboriginal Interests in the Fraser River upstream of TMJ and other waterways within the Fraser River estuary, including the Nicomekl and Serpentine Rivers. Katzie First Nation has identified past and ongoing effects that have altered and reduced their use over time. Katzie First Nation identified that the Fraser River and its tributaries have high archeological and cultural significance (tangible and intangible) and represent important places for Katzie First Nation. Katzie First Nation's Aboriginal Interests extend beyond fishing and other TLU practices and include cultural and environmental stewardship. Katzie people believe good stewardship of the land and waters is based upon a deep and holistic approach to nature that embodies the inseparability of human and ecosystem health. Wetland environments along the shoreline of the Fraser River, and all levels of the complex aquatic food chain, are important to Katzie First Nation's and have sustained Katzie First Nation's way of life

[336] Indigenous and Northern Affairs Canada. 2022. First Nation Profiles – Katzie First Nation. https://fnp-ppn.aadnc-aandc.gc.ca/fnp/Main/Search/FNRegPopulation.aspx?BAND_NUMBER=563&lang=eng, Accessed March 22, 2022.

since time immemorial. Katzie First Nation's oral histories include that the traditional territory was created for Katzie people to manage the resources within it for the benefit of both the Katzie people and others, and Katzie First Nation consider respectful stewardship of the land and its resources as a sacred duty and great responsibility.

15.1.2 KATZIE FIRST NATION'S INVOLVEMENT IN THE CONSULTATION PROCESS

The EAO sent a notification email to Katzie First Nation May 6, 2015 noting that TMJ was to be subject to a provincial EA pursuant to the Act. The EAO set out its approach to consultation, including an initial assessment of strength of claim and potential impacts on Katzie First Nation's Aboriginal Interests in a letter to Katzie First Nation dated June 18, 2015. Based on the Province's initial strength of claim assessment, Katzie First Nation was consulted at the notification level as set out in Schedule C of the Section 11 Order for TMJ.

A summary of TJLP's engagement activities with Katzie First Nation is provided in the Application and in TJLP's Aboriginal Consultation Reports.

As specified in Section 12.2 of the Section 11 Order, the EAO provided Katzie First Nation notification of, and relevant information at, key milestones during the EA process for TMJ so that Katzie First Nation could be informed of the progress of the EA and have the opportunity to raise any issues to the EAO for discussion. During the EA process, the EAO and Katzie First Nation met to discuss EAO's rationale for placing Katzie First Nation on Schedule C, the opportunities for Katzie First Nation's involvement in the EA, and Katzie First Nation's concerns regarding TMJ's impact on Aboriginal Interests. The EAO is of the view that it has approached consultation with Katzie First Nation with the intent to identify potential impacts and consider ways to address any potential TMJ-related impacts identified by Katzie First Nation to their Aboriginal Interests. This included meeting with Katzie First Nation and providing Katzie First Nation with the opportunity to provide feedback on the Application and the EAO's draft part C of the Assessment Report in advance of the final public comment period.

The EAO issued the final AIR on November 29, 2016 and notified Katzie First Nation. The EAO initiated the 180-day Application Review period on March 20, 2019 and notified Katzie First Nation by email. The EAO also notified Katzie First Nation regarding the start of the public comment period for TMJ on March 26, 2019 and invited Katzie First Nation to review and comment on the Application. On June 5, 2020, the EAO invited Katzie First Nation to review the EAO's draft Part C Assessment Report, including the EAO's draft assessment of potential impacts to Katzie First Nation's Aboriginal Interests.

Katzie First Nation provided feedback on the EAO's draft Part C of the Assessment Report, including identifying potential concerns that TMJ could negatively impact Katzie Nation's fishing rights, result in deleterious impacts to the environment and Katzie First Nation's Aboriginal Interests due to spills, and contribute to shipping-related cumulative impacts to access, safety and risk of spill. Katzie First Nation also expressed that cultural and environmental stewardship is a part of Katzie First Nation's Aboriginal Interests and requested that affected Indigenous communities be involved in the development of cultural and archaeological resource management plans for documented and undocumented resources. Katzie First Nation also identified that accidental spill risks associated with TMJ could also impact their stewardship values, concern about that construction of TMJ and dredging may have impacts on cultural and heritage resources (i.e., archeological sites).

Katzie also express that baseline used for the EAO's impacts assessment was not appropriate and was linked to insufficient cumulative effects perspective. Katzie First Nation requested the opportunity to be consulted on the various management plans that would be developed pursuant to provincial conditions, including associated capacity funding, if TMJ were granted an EAC. The EAO considered cumulative effects in the assessment of potential impacts to Aboriginal Interests as described in Section 13.1 of Part C. The EAO would not require that that TJLP consult with Schedule C Indigenous Groups in development of management plans pursuant to provincial conditions and notes that where monitoring or reporting would be required for conditions, these documents would be posted to the EAO's public website. The EAO considered Katzie First Nation's feedback provided on the draft Part C Assessment Report and updated the report to better reflect Katzie First Nation's concerns and perspectives related to potential impacts to Katzie First Nation's Aboriginal Interests due to TMJ and the consultation process.

15.1.3 POTENTIAL IMPACTS TO ABORIGINAL INTERESTS

The following sections focus on potential impacts of the Project to Katzie First Nation's Aboriginal Interests. A discussion of the EAO's assessment approach is provided in the EAO's Consultation Process Methodology section of Part C. The EAO considered information available, including from public sources as well as relevant issues raised by the Katzie First Nation during the EA process (in meetings, letters and Working Group comments), in the following assessment of the potential impacts of TMJ on the Katzie First Nation's Aboriginal Interests.

The following sections focus on potential impacts of TMJ to Katzie First Nation's Aboriginal right to fish, hunt, trap and gather, mitigations and accommodations to address potential impacts.

A. POTENTIAL IMPACTS ON FISHING

Currently, Katzie First Nation's communal food, social or ceremonial (FSC) fishing occurs upstream of the Port Mann Bridge, and often in the river up to and including Kanaka Creek/Derby Reach (approximately 20 km upriver from the TMJ site). This area includes their traditional fishing locations around Barnston Island. In this stretch of the river upstream of the Port Mann Bridge, Katzie First Nation are licenced to fish for Chinook, sockeye, and chum salmon, steelhead, and eulachon, as well as for chum salmon specifically in the Pitt River. Katzie First Nation also had access to Fraser River FSC fisheries as part of the lower Fraser River First Nations.

DFO data indicates that for 2014, 36 communal FSC licences, 4 communal FSC licences with limited participation, and 23 communal FSC licences with allowance for sale were issued to Katzie First Nation. These different licences were issued for eulachon (drift net only), sockeye (set net, drift net or beach seine), and Chinook (set or drift net). Timing and openings differed based on the licence. Katzie First Nation has previously advised that of all their registered members, roughly one third of those members is reportedly licensed to fish during openings on the Fraser River, and an estimated 120 Katzie First Nation vessels use the Fraser River to harvest fish annually.

Katzie First Nation has also reported that from about the 1940s to the 1980s, many of their members were involved in the commercial fishery, with some running their own boats. In 2014, Katzie First Nation along with other lower Fraser River First Nations, participated in an economic opportunity fishery for sockeye, and reported that they obtained approximately 10,000 sockeye during this fishery that were eligible for sale.

The EAO evaluated the potential effects on fishing rights attributable to TMJ which are summarized in Section 13.3.1 of Part C. The EAO is satisfied that the key impacts to biophysical components resulting in changes to fish quantity and quality, changes in access to fishing resources, and changes to social, cultural, and spiritual values associated with traditional fishing activities summarized in that section apply to Katzie First Nation. The following section focuses on the specific issues and potential impacts to the Katzie First Nation's Aboriginal right to fish.

Katzie First Nation identified a key concern was potential for detrimental effects to Katzie First Nation's fishing rights due to impacts to fish and fish habitat during construction of TMJ, increased TMJ-related vessel traffic or in the event of a hazardous material spill in the Fraser River. Katzie First Nation expressed concerns that limited information was available on the impacts of LNG spill on a water body, there could be potential effects from a spill on the environment which could negatively impact Katzie First Nation's Aboriginal Interests. Katzie First Nation also expressed concern that cumulative effects related to marine shipping would further increase the risks of an accident and malfunctions resulting in spills. To avoid and/or

reduce these impacts, Katzie First Nation requested that spill mitigation and management measures (including long term bio-physical baseline monitoring), including spill response, were meaningfully factored into the assessment and EAC conditions (if a Certificate is issued).

The EAO respectfully acknowledges Katzie First Nation's concern and worldview provided in understanding the importance of the Fraser River ecosystem, salmon and other resources within Katzie First Nation's asserted traditional territory to sustaining Katzie First Nation's harvesting rights, and cultural and stewardship values. The EAO understands that Katzie First Nation has concerns regarding the current state of the ecosystem, including potential effects on fish, such as salmon, from underwater noise, construction and associated habitat loss, increased vessel traffic, and/or an LNG spill event in the Fraser River, which would lead to detrimental effects on Katzie First Nation's fishing rights, and cultural and stewardship values.

- As described in the Accidents and Malfunctions Section 9.0 of Part B of this report, the EAO is satisfied that potential accidents and malfunction associated with TMJ have been adequately identified and assessed for this EA. The EAO concludes that impacts from potential accidents and malfunctions on environmental VCs, such as fish and fish habitat vegetation and wildlife and wildlife habitat, would be low to moderate. The EAO is recommending KMMs under CEAA 2012 for an Emergency Response Plan and a Marine Shipping Emergency Response Outreach Program. The EAO is also proposing conditions requiring the development of a CEMP and OEMP, which would include emergency response planning and spill prevention for the marine terminal area. The EAO notes that where monitoring or reporting would be required for conditions, these documents would be posted to the EAO's public website; and
- The EAO is recommending KMMs under CEAA 2012, including the Fish Mitigations to Reduce Harm and Mortality, Fish Habitat Offset Plan, and Vessel Traffic Management Plan and concludes that effects to fish and fish habitat from TMJ would not be significant within the LAA/RAA.

Conclusion

In consideration of the available information, the EAO's consultation with Katzie First Nation, Katzie First Nation's engagement with TJLP, TJLP's commitments, the EAO's proposed EAC conditions if an EAC is issued and the recommended KMMs under CEAA 2012, TMJ is expected to result in a **negligible-to-minor** impact on Katzie First Nation's right to fish.

The key factors that were considered in support of the EAO's conclusion on the impacts to the right to fish are summarized as follows:

Biophysical:

- The EAO's conclusions in the Fish and Fish Habitat in Part B that TMJ would have potential to result in low magnitude residual effects to fish and fish habitat at the TMJ site, and low magnitude residual effects to sturgeon from vessel strikes; and
- The lower Fraser River is highly industrial and the TMJ area is previously disturbed.

Geospatial (places, site and access):

- The importance of fishing on the Fraser River and that Katzie First Nation's members currently fish upstream of the TMJ site; and
- During construction (just over three years in duration) and operations (30 years in duration) Indigenous mariners and fishers would avoid entering and remaining in the marine terminal area and TMJ-related vessel activity may result in short-term, temporary disruptions to Katzie First Nation members traveling on the Fraser River within the vicinity of the TMJ site for fishing purposes.

Social, Cultural and Experiential:

- As outlined in the Current Use of Lands and Resources for Traditional Purposes section in Part B, potential negligible to low magnitude impacts to the change in noise and visual quality during construction and to changes in visual quality and potential concerns about safety during operations in the Fraser River; and
- Environmental stewardship is a sacred duty for Katzie First Nation that considers good stewardship of the land and waters is based upon deep and holistic approach to nature that embodies the inseparability of human and ecosystem health.

Mitigations:

- Proposed mitigations to reduce impacts to Katzie First Nation's right to fish include mitigations to reduce impacts to noise and visual quality in the CEMP and OEMP as well as the recommended key mitigations under CEAA 2012, specifically the Fish Mitigation to Reduce Harm and Mortality, the Fish Habitat Offset Plan, and follow-up programs, the Marine Communication Plan, the Marine Access and Transportation Plan and the Vessel Traffic Management Plan.

B. POTENTIAL IMPACTS ON HUNTING, TRAPPING AND GATHERING

Katzie First Nation has reported that their members have harvested a wide variety of mammals and birds within their territory, including deer, elk, mountain goat, black bear, beaver, marten, mink, and raccoon. Katzie First Nation also harvested waterfowl, which they have indicated

were abundant on the shores and marshy flats on and around Pitt River and Pitt Lake. Katzie First Nation has also reported that their members historically harvested a wide variety of plant species for sustenance and cultural purposes, including wapato, cranberries, bog blueberries, strawberries, salmonberries, blackberries, blackcaps, thimbleberries, red and blue huckleberries, Saskatoons, salal-berries, crabapple, oso plum and back haw. Traditional gathering areas were identified at the mouth of the Alouette River, Sturgeon Slough, Silver Creek and the west banks of Pitt River.

Katzie First Nation reported that hunting is almost as important to their subsistence and ceremonial lives as fishing, but also reported that they are now limited to a few remaining areas where it is safe to use firearms given the development within their territory. Katzie First Nation reported that they still harvest waterfowl on Barnston Island, but the harvesting area on the island is limited. The EAO evaluated the potential effects on hunting, trapping and gathering rights attributable to TMJ which apply broadly to Indigenous Groups. These potential effects are summarized in Section 13.2.2. The EAO is satisfied that the key impacts to biophysical components resulting in changes to wildlife and vegetation quantity and quality, changes in access to hunting, trapping and gathering areas, and changes to social, cultural, and spiritual values associated with traditional hunting, trapping and gathering activities summarized in Section 13.2.2 apply to Katzie First Nation. Katzie First Nation did not raise specific issues and concerns with potential Project impacts relating to hunting, trapping and gathering.

Conclusion

In consideration of the available information, the EAO's consultation with Katzie First Nation, Katzie First Nation's engagement with TJLP, TJLP's commitments, the EAO's proposed EAC conditions if an EAC is issued and the recommended KMMs under CEAA 2012, TMJ is expected to result in a negligible impact on Katzie First Nation's right to hunt, trap and gather.

The key factors that were considered in support of the EAO's conclusion on the impacts to the right to hunt, trap and gather are summarized as follows:

Biophysical:

- The EAO's conclusions at the TMJ site on adverse residual effects to wildlife and vegetation (see respective chapters in Part B) which indicate negligible to low magnitude residual effects on loss or alteration of wildlife habitat, sensory disturbance from noise and light, and mortality; as well as low magnitude residual effects on wetland and riparian ecosystems; and
- Terrestrial wildlife species of cultural importance to Katzie First Nation members have either not been found within the TMJ area or are not anticipated to be affected by the TMJ-related activities.

Geospatial (places, sites and access):

- Construction (just over three years in duration) and operation (30 years) is unlikely to cause disruptions to Katzie First Nation members access to areas traditionally used for hunting, trapping, and gathering activities at the TMJ site; and
- The upland portion of the TMJ site is situated on fee simple (private) land.

Social, Cultural and Experiential:

- Potential impacts to experience in the vicinity of the TMJ site due to a change in noise and visual quality (see respective chapters in Part B) during construction and operation which are anticipated to be negligible to low in magnitude in the Fraser River.

Mitigations:

- Proposed conditions to mitigate impacts to Katzie First Nation's right to hunt, trap and gather are the vegetation and wetland management, wildlife and wildlife habitat management, light management and noise management components of the CEMP and OEMP. The EAO is also proposing these mitigations as KMMs under CEAA 2012 which would include the requirements for vegetation and wetland creation and restoration, lighting, noise and wildlife and wildlife habitat management and monitoring.

C. POTENTIAL IMPACTS ON OTHER TRADITIONAL AND CULTURAL INTERESTS

Katzie First Nation has explained that their identity and territory are inseparable, and that the landscape is sacred, filled with meaning that informs Katzie First Nation members' identity, and ties Katzie First Nation to a wider community of kin that share a common ancestry and relationships to cultural landscapes and sense of place. Wetland environments along the shoreline of the Fraser River, and all levels of the complex aquatic food chain, are important to Katzie First Nation's and have sustained Katzie First Nation's way of life since time immemorial. Katzie First Nation's Aboriginal Interests extend beyond fishing and other TLU practices and include cultural and environmental stewardship within their territory.

Katzie First Nation has reported that the Fraser River and other waterways within the Fraser River estuary were focal points for harvesting fish, wildlife and plant resources. They were also travel and trade corridors, connecting Katzie First Nation with neighbouring communities. Katzie First Nation reports that these ties continue to be an important component of Katzie First Nation identity, but that development and industrialization along the Fraser River has changed the waterways that facilitated Katzie First Nation's ties to their neighbours. Katzie First Nation notes that as access to their territory declines, each opportunity to practice traditional activities, such as knowledge transmission, becomes even more important. Katzie First Nation states that their ability to practice their cultural heritage includes their continuous use and

connection to harvesting areas, spiritual and ceremonial sites, named locations, cultural landmarks and archaeological sites.

Katzie First Nation identified that their Aboriginal Interests extend beyond fishing and other TLU practices and include cultural and environmental stewardship within Katzie First Nation's territory and that cultural stewardship is intrinsically linked to Katzie First Nation's rights. Katzie First Nation identified that the Fraser River and its tributaries have high archeological and cultural significance (tangible and intangible) and represent important places for Katzie First Nation. Katzie First Nation requested that TJLP and potentially affected Indigenous communities collaboratively develop a Cultural and Archaeological Resources Management Plan that considers both documented and undocumented resources.

- The EAO proposes Condition 17: Indigenous Cultural Awareness, Recognition and Mitigation to mitigate TMJ-related effect on cultural resources in the marine terminal area, developed in consultation with Schedule B Indigenous Groups. The EAO notes that where monitoring or reporting would be required for conditions, these documents would be posted to the EAO's public website.

Katzie First Nation also identified linkages between risks associated with LNG spills, dredging activities, cumulative effects of marine shipping, wake effects, and potential impacts to Katzie First Nation's environmental stewardship and other cultural heritage values associated with surrounding shorelines and wetlands and the complex food webs that have sustained Katzie First Nation cultural since time immemorial. Katzie First Nation requested stringent vessel and maintenance requirements, ongoing baseline monitoring of Fraser River ecosystem health to measure and assess potential impacts throughout the life of TMJ and effective spill mitigation and management measures as EAC conditions (if a Certificate is issued).

- The EAO concludes in the Accidents and Malfunctions section of Part B that there is potential for extremely rare likelihood but very high severity of consequences of accidents and malfunctions causing irreversible damage to heritage resources, for which the residual risk is moderate. For potential impacts of accidents and malfunctions on other environmental VCs, the residual risk level is low to moderate. The EAO did not predict any residual effects to heritage resources from erosion due to wake effects along the shorelines of the Fraser River in the RAA in the Heritage Resources section of Part B;
- The EAO is recommending KMMs under CEAA 2012 for an Emergency Response Plan and a Marine Shipping Emergency Response Outreach Program. The EAO is also proposing conditions requiring the development of a CEMP and OEMP, which would include emergency response planning and spill prevention for the marine terminal area. The EAO notes that where monitoring or reporting would be

required for conditions, these documents would be posted to the EAO's public website; and

- The EAO understands that marine shipping associated with TMJ would be required to meet the international standards and Canadian regulations set out by Canada's compliance-based marine safety and security system, which is designed to protect life, property, and the marine environment.

Conclusion

In consideration of the available information, consultation with Katzie First Nation, Katzie First Nation's engagement with TJLP, TJLP's commitments, the EAO's proposed EAC conditions if an EAC is issued, TMJ is expected to result in a **negligible** impact on Katzie First Nation's other traditional and cultural interests.

The key factors that were considered in support of EAO's conclusion on the impacts to other traditional and cultural interests are summarized as follows:

Cultural Heritage Resources:

- The EAO's conclusions in Heritage Resources chapter of Part B did not predict residual effects to Heritage Resources (Section 7.1) from erosion due to wake effects along the shorelines of the Fraser River in the RAA; and
- The lower Fraser River is highly industrial and the TMJ site is previously disturbed (this factor increase the seriousness of impact of TMJ).

Geospatial (places, sites and access):

- Construction and operations are unlikely to cause disruptions to Katzie First Nation's access to cultural sites and uses identified by Katzie First Nation in the Fraser River area;
- The small number of TMJ-related vessels relative to current vessel traffic are predicted to have a negligible to low effect on cultural activities in the MSA area in terms of access from relatively infrequent and short duration disruptions to access due to the regularly occurring transit of vessels to and from TMJ's marine terminal area; and
- Katzie First Nation identify that the Fraser River have high archeological and cultural significance and represent and important place.

Social, Cultural, Experiential:

- The EAO's conclusions on Noise in Part B which found sensory disturbances from noise are anticipated to be negligible to low magnitude, temporary and short-term;
- The EAO's conclusions on Visual Quality in Part B which found a negligible to low impact

to the existing visual landscape character in the Fraser River; and

- Katzie First Nation identified other TLU practices, including cultural and environmental stewardship that is linked to Katzie First Nation's Aboriginal Interests and stewardship is considered a sacred duty and important responsibility.

Mitigations:

- Proposed provincial conditions to mitigate impacts to cultural heritage are the development of the Cultural and Archaeological Resources Management Plan for the TMJ site, the Lighting Management, Noise and Vibration Management and Air Quality Management as part of the CEMP and OEMP as well as the Water Quality Management Plan and the Indigenous Cultural Awareness and Recognition Condition;
- *Heritage Conservation Act* (RSBC 1996, c. 182); and
- Proposed mitigations for potential impacts to traditional and cultural interests are the recommended key mitigations under CEAA 2012 for a Marine Communications, and Vessel Traffic Management Plans, and a Marine Shipping Emergency Response Outreach Program.

15.2 STÓ:LŌ COMMUNITIES

15.2.1 COMMUNITY PROFILE

The Stó:lō are Coast Salish speakers of the Halkomelem language that traditionally lived along the lower Fraser River below Yale. The Stó:lō Nation is the political amalgamation of 11 Stó:lō communities or Nations[337]. Based on differences in dialect and culture, the Stó:lō groups may be described as Upper and Lower Stó:lō, or Upriver and Downriver Halkomelem.

The Stó:lō Nation's asserted territory extends from the mouth of the Fraser River up to the Lower Fraser Canyon. Geographically, this territory extends from the US border in the south, to Garibaldi Provincial Park in the north, and from the City of Vancouver in the west, to just past the community of Hope in the east. Stó:lō Nation and Stó:lō Tribal Council assert collective Aboriginal title and rights to the lands encompassed by their member nations/bands. The

[337] The Stó:lō communities or Nations include: Aitchelitz Indian Band, Leq'a:mel First Nation, Matsqui First Nation, Popkum First Nation, Skawahlook First Nation, Skowkale First Nation, Shxwhá:y Village, Squiala First Nation, Sumas First Nation, Tzeachten First Nation and Yakweakwioose First Nation

People of the River Referrals Office was formed in 2012 as a virtual office of technical staff from Stó:lō Nation (Stó:lō Research and Resource Management Centre), Stó:lō Tribal Council[338], and the Ts'elxeyeqw Tribe. The People of the River Referrals Office provides administrative, research, and technical support for consultation with 13 groups[339] who are signatories to the Stó:lō Strategic Engagement Agreement (SEA).

15.2.2 STÓ:LŌ NATION'S INVOLVEMENT IN THE CONSULTATION PROCESS

On May 6, 2015, the EAO sent a notification email to Shxw'ow'hamel First Nation, Skawahlook First Nation, Soowahlie First Nation, and Seabird Island First Nation (the Stó:lō Communities) noting that TMJ was to be subject to a provincial EA pursuant to the Act. At that time, Shxw'ow'hamel First Nation, Skawahlook First Nation and Soowahlie First Nation were affiliated with the People of the River Referrals Office (PRRO), and all of the EAO communication was directed to the PRRO for those First Nations. Seabird Island Band operates independently, and communication was sent to Seabird Island First Nation directly.

The EAO set out its approach to consultation, including an initial assessment of strength of claim and potential impacts on Stó:lō Communities' Aboriginal Interests in a letter to Stó:lō Communities dated June 18, 2015. Based on the Province's initial strength of claim assessment, Stó:lō Communities were consulted at the notification level as set out in Schedule C of the Section 11 Order for TMJ. Stó:lō Communities expressed to the EAO through correspondence their disagreement with the EAO's initial strength of claim assessment and putting them on Schedule C. Stó:lō Communities asserted that the EAO's initial strength of claim analysis did not take into account or acknowledge their use of the Fraser River for travel, the cultural identity of the Stó:lō, nor did it reflect their current view of Traditional Territory as outlined by the United Nations Declaration on the Rights of Indigenous Peoples. The EAO acknowledged the concerns and offered opportunities for additional engagement, for example: in person meetings; bilateral meetings with TJLP; and earlier review of draft materials.

As specified in Section 12.2 of the Section 11 Order, the EAO provided Stó:lō Communities notification of, and relevant information at, key milestones during the EA process for TMJ so that Stó:lō Communities could be informed of the progress of the EA and have the opportunity

[338] Stó:lō Tribal Council communities include: Seabird Island Band, Scowlitz First Nation, Soowahlie First Nation, Kwaw'Kwaw'Apilt First Nation, Shxw'ow'hamel First Nation, Chawathil Indian Band and Cheam First Nation.

[339] The People of the River Referrals Office provides administrative, research and technical support for consultation with the following groups: Aitchelitz Indian Band, Skawahlook First Nation, Skowkale First Nation, Shxwhá:y Village, Squiala First Nation, Sumas First Nation, Tzeachten First Nation and Yakweakwioose First Nation, Scowlitz First Nation, Soowahlie First Nation, Kwaw'Kwaw'Apilt First Nation, Chawathil Indian Band and Cheam First Nation.

to raise any issues to the EAO for discussion. The EAO issued the final AIR on November 29, 2016 and notified Stó:lō Communities. The EAO accepted TMJ's Application for an EAC on March 20, 2019 and notified Stó:lō Communities by email. The EAO also notified Stó:lō Communities regarding the start of the public comment period for TMJ on March 26, 2019, and invited Stó:lō Communities to review and comment on the Application. On June 5, 2020, the EAO invited Stó:lō Communities to review the EAO's draft Part C Assessment Report, including the EAO's draft assessment of potential impacts to Stó:lō Nation's Aboriginal Interests.

A summary of TJLP's engagement activities with Stó:lō Communities is provided in the Application and in TJLP's Aboriginal Consultation Reports.

15.2.3 POTENTIAL IMPACTS TO ABORIGINAL INTERESTS

The EAO understands that for the Upper Stó:lō Indigenous Groups, salmon fishing contributed the greatest amount of food, and as with other Central Coast Salish groups, dried salmon was a particularly important stored winter food. The five miles of the Fraser River Canyon upstream of Yale were particularly important for catching and drying salmon. Salmon were caught in the canyon with dip nets and in smaller rivers with gaff hooks, weirs and by other means, including in smaller streams in the lower Fraser Valley. Other fish caught by Upper Stó:lō Indigenous Groups included sturgeon, trout, and eulachon. Upper Stó:lō Indigenous Groups reportedly fished for eulachon in the vicinity of Fort Langley and at the mouth of the Pitt River. The Upper Stó:lō Aboriginal groups are also understood to have traded for fresh or dried clams with Indigenous groups located further downstream along the Fraser River.

Stó:lō reported that the area below the Port Mann Bridge, which includes the TMJ site, is not fished by Stó:lō member Nations, but reported fishing in the areas between the Port Mann Bridge to Sawmill Creek. Stó:lō member Nations have reported that due to DFO regulations, fishing windows have been restricted which they assert has impacted fishing activities and the transfer of cultural knowledge.

Stó:lō reported hunting deer, elk, mountain goat, bear and small types of game as well as birds such as pheasants, grouse, duck and loon. Hunting and trapping are important for ceremonial and subsistence purposes to Stó:lō community members and continues to play a vital role in Stó:lō culture. Members hunt black tail deer, black bear, bobcat, cougar and grouse at current hunting sites such as Sumas Mountain and Mount Cheam. Stó:lō community members previously reported that habitat fragmentation by development has had a major impact on their hunting practices.

Stó:lō community members reported gathering a variety of plants such as roots (bracken fern, camas, tiger lily) and berries (blueberries, cranberries, huckleberries, salmon berries, salal

berries, Saskatoon berries and strawberries) as well as cedar roots, bark and wood for sustenance, medicinal and ceremonial uses. Stó:lō estimated that 75 percent of their community members continue to harvest traditional materials for FSC purposes today and have expressed concern regarding lost opportunities to gather traditionally harvested plants as well as the potential contamination of plants.

Stó:lō community members reported historically using the Fraser River and its tributaries as a transportation corridor. Stó:lō community members currently practice traditional travel (canoeing) in ceremonial and spiritual practices for fishing, hunting, trapping and plant gathering as well as for wind drying activities. Stó:lō community members have previously reported the loss of traditional bathing sites due to the cumulative effects of transportation development, tourism and recreation.

The People of the River Referrals Office raised the following concerns regarding potential impacts to Aboriginal Interests due to TMJ:

- Concerns regarding the impacts of noise and vibration from pile driving and maintenance dredging on salmonids.
    - See Section 13.3.1 of Part C for a detailed discussion of the analysis and resolution of concerns related to the effects of underwater noise from TMJ on fish. As discussed in that section, the EAO is recommending KMMs under CEAA 2012, including the Fish Mitigations to Reduce Harm and Mortality, including the use of bubble curtains at all times during impact pile driving where feasible and during vibratory pile driving if noise levels exceed thresholds.
- Concerns regarding TMJ's potential adverse effects on fish and fish habitat (specifically green and white sturgeon as well as salmon) due to pollution travelling to intertidal estuaries of the Fraser River and an increase in marine traffic.
    - See Section 13.3.1 of Part C for a detailed discussion of the analysis and resolution of concerns related to TMJ effects on fish and fish habitat. As discussed in that section, the EAO is recommending KMMs under CEAA 2012, including the Fish Mitigations to Reduce Harm and Mortality and Fish Habitat Offset Plan. The offsetting plan would be developed in consultation with Schedule B Indigenous Groups and identify offsets that are greater and of higher fisheries value (higher productivity) than the habitat that would be directly lost by TMJ. It would also include a monitoring program to assess and evaluate the effectiveness of offsetting measures and would require the incorporation of Indigenous traditional knowledge and the effectiveness of the proposed fish habitat offset.

- As described in the Current Use of Lands and Resources for Traditional Purposes in Part B, the EAO predicts that TMJ-related vessel transits would have negligible to low magnitude effects to access to fishing compared to baseline numbers of vessel transits, that could be experienced as higher in the Fraser River compared to Salish Sea. The EAO is proposing a KMM under CEAA 2012 for TJLP to develop a Marine Communication Plan for TMJ (from the jetty out to 12 nm), including procedures to inform Indigenous Groups of traffic schedules, for Indigenous Groups to submit any feedback on potential adverse effects on navigation as a result of TMJ, and for TJLP to document and respond to any feedback received in a timely manner.

Conclusion

In consideration of the information available, the EAO 's consultation with Stó:lō Communities, Stó:lō Communities' engagement with TJLP, TJLP's commitments, the EAO's proposed EAC conditions if an EAC is issued and the recommended KMMs under CEAA 2012, TMJ is expected to result in a **negligible-to-minor** impact on Stó:lō Communities' Aboriginal right to fish and a **negligible** impact on Stó:lō Communities' right to hunt, trap, gather plants and other traditional and cultural interests.

The key factors that were considered in support of EAO's conclusion on the impacts to Aboriginal Interests are summarized as follows:

Biophysical:

- The lower Fraser River is highly industrial and the TMJ site is previously disturbed;
- **Fishing:** The EAO's conclusions in the Fish and Fish Habitat in Part B that TMJ would have potential to result in low magnitude residual effects to fish and fish habitat at the TMJ site, and low magnitude residual effects to sturgeon from vessel strikes;
- **Hunting, trapping and gathering:** The EAO's conclusions on adverse residual effects to wildlife and vegetation (see respective chapters in Part B) which indicate negligible to low magnitude residual effects on loss or alteration of wildlife habitat, sensory disturbance from noise and light, and mortality; as well as low magnitude residual effects on wetland and riparian ecosystems; and
- **Other Traditional and Cultural Interests:** The EAO's conclusions in the Heritage Resources chapter of Part B found no residual effects to paleontological resources and historical and physical heritage and no residual effects on Heritage Resources from erosion due to wake effects along the shorelines of the Fraser River in the RAA.

Geospatial (places, sites and access):

- During construction (just over three years in duration) and operations (30 years in duration) Indigenous mariners and fishers would avoid entering and remaining in the marine terminal area and TMJ-related vessel activity may result in short-term, temporary disruptions to traveling on the Fraser River to access fishing areas used by Sto:lo upstream of the TMJ site;
- Construction (just over three years in duration) and operation (30 years) is unlikely to cause disruptions to Stó:lō Community members access to areas traditionally used for hunting, trapping, and gathering activities or cultural sites; and
- The upland portion of the TMJ site is situated on fee simple (private) land and previously disturbed foreshore.

Social, Cultural and Experiential:

- As outlined in the Current Use of Lands and Resources for Traditional Purposes section in Part B, potential impacts to experience in the vicinity of the TMJ area due to a change in current use, noise and visual quality (see respective chapters in Part B) during construction and operations which are anticipated to be negligible to low in magnitude in the Fraser River.

Mitigations:

- **Fishing:** Proposed mitigations to reduce impacts to the right to fish, include mitigations to reduce impacts to noise and visual quality in the CEMP and OEMP as well as the recommended key mitigations under CEAA 2012, specifically the Fish Mitigation to Reduce Harm and Mortality, the Fish Habitat Offset Plan, and follow-up programs, the Marine Communications Plan, the Marine Access and Transportation Plan and the Vessel Traffic Management Plan;
- **Hunting, trapping and gathering:** Proposed conditions to mitigate impacts to Stó:lō Communities' right to hunt, trap and gather are the vegetation and wetland management, wildlife and wildlife habitat management, light management and noise management components of the CEMP and OEMP. The EAO is also proposing these mitigations as KMMs under CEAA 2012 which would include the requirements for vegetation and wetland creation and restoration, lighting, noise and wildlife and wildlife habitat management and monitoring; and
- **Other Traditional and Cultural Interests:** Proposed conditions to mitigate impacts to Sto:lo Communities' other traditional and cultural interests are the Cultural and Archaeological Resources Management Plan for the TMJ site, the Lighting Management, Noise and Vibration Management and Air Quality Management as part of the CEMP and

OEMP as well as the Water Quality Management Plan and the Indigenous Cultural Awareness and Recognition Condition; HCA, (RSBC 1996, c. 182).

15.3 kʷikʷəƛ̓əm (KWIKWETLEM FIRST NATION)

15.3.1 COMMUNITY PROFILE

kʷikʷəƛ̓əm is a Central Coast Salish Indigenous Group situated along the Coquitlam River in southwestern British Columbia. kʷikʷəƛ̓əm's ancestral language is *hən̓q̓əmin̓əm̓* (Down River dialect of Halkomelem). The cities of Coquitlam and Port Coquitlam take their name after the kʷikʷəƛ̓əm people.

kʷikʷəƛ̓əm has two reserves, IR 1 is located at the confluence of the Coquitlam and Fraser Rivers at the ancient village site of *slakəya'nc*, and IR 2 is located 2.5 km up the Coquitlam River at the ancient village site of *setɬama'kmən*. The latter serves as the administrative and governmental hub providing kʷikʷəƛ̓əm public services and contains a residential sub-Division. kʷikʷəƛ̓əm has 128 registered members, of which about one third of the members live on kʷikʷəƛ̓əm reserve lands[340]. TMJ area does not overlap any kʷikʷəƛ̓əm reserve lands.

Through the EA process for the South Fraser Perimeter Road Project, kʷikʷəƛ̓əm have stated their traditional territory centers on the Coquitlam Lake Watershed, including the upper and lower Coquitlam River. The territory extends to the east side of Pitt Lake and includes both sides of the lower Pitt River. To the west, the territory extends along Possum Creek, across Port Moody Inlet to Stony Creek, and across Sapperton Heights to the north arm of the Fraser River. The southern extent of the territory extends from the west end of Barnston Island to the east end of Annacis Island and includes that portion of the Fraser uplands two km south of the

[340] Indigenous and Northern Affairs Canada. 2022. First Nation Profiles – Kwikwetlem First Nation. https://fnp-ppn.aadnc-aandc.gc.ca/fnp/Main/Search/FNRegPopulation.aspx?BAND_NUMBER=560&lang=eng, accessed December 9, 2021.

Fraser River[341*]. kʷikʷəƛ̓əm people have a strong connection to the lands and waters of their home. Traditionally, kʷikʷəƛ̓əm is a fishing community, many members continue to work today in the fishing Industry. kʷikʷəƛ̓əm carries on the legacy of its ancestors as stewards of the land, water, and resources within their traditional territory. Leading as advocates for the environment as well as local natural and cultural resources, kʷikʷəƛ̓əm consults with everyone undertaking significant development in their traditional territory. kʷikʷəƛ̓əm's asserted traditional territory is approximately four km east of TMJ.

15.3.2 KWIWKETLEM FIRST NATION'S INVOLVEMENT IN THE CONSULTATION PROCESS

Initially kʷikʷəƛ̓əm was not included in the Section 11 Order list of Indigenous Groups for TMJ, and then the EAO later became aware of kʷikʷəƛ̓əm's interests related to TMJ during the Application Review phase for TMJ. While not involved during earlier phases of the EA, kʷikʷəƛ̓əm later identified an interest in understanding the intent behind the proposed mitigations on the project, including requesting greater Indigenous oversight in the conditions and that the EAO require TJLP to develop a plan that would commit to a reasonable timeline for review of draft plans by Nations to ensure Free, Prior, and Informed Consent is achieved. On September 20, 2021, the EAO and kʷikʷəƛ̓əm met to discuss the opportunities for kʷikʷəƛ̓əm involvement in the EA, and kʷikʷəƛ̓əm's concerns regarding TMJ's impact on Aboriginal Interests. During the meeting the parties discussed kʷikʷəƛ̓əm's concerns related to the limited opportunities for engagement to date on the EA for TMJ, as well as potential impacts to climate change due to marine shipping.

On November 23, 2021, the EAO received a letter from TJLP that described recent developments in the LNG bunkering/ bunker vessel markets and implications for the TMJ EA timeline. Then on December 2, 2022, the EAO approved a *Section 24(4) Order* to extend the review period for TMJ to allow for TJLP to conduct the BVSA. On December 7, 2021, the EAO invited kʷikʷəƛ̓əm, via email, to participate as a Schedule C Indigenous Group for the BVSA-related analysis to be undertaken for TMJ prior to referral. On January 6, 2022, kʷikʷəƛ̓əm

[341]EAO. July 27, 2008. SFPR Project Assessment Report. https://www.projects.eao.gov.bc.ca/api/public/document/5888e56c817b85ae43cf7a92/download/South%20Fraser%20Perimeter%20Road%20Project%20Assessment%20Report%20and%20Appendicies%20dated%20Jun%2027_08.pdf

[*] Noting as of July 2008, kʷikʷəƛ̓əm has indicated that as they have never undertaken a comprehensive Traditional Use Study (TUS), this description of their traditional territory is a provisional one, setting provisional or draft boundaries for the territory and, as such is subject to modification as further information becomes available or when a comprehensive TUS is completed

responded the EAO by requesting that it be added to the list of Schedule C Indigenous Groups for the remainder of the TMJ EA. kʷikʷəƛ̓əm was added to Schedule C by Section 13 Order on January 19, 2022. As specified in Section 12.2 of the Section 11 Order, the EAO provided kʷikʷəƛ̓əm notification of, and relevant information at, key milestones during the EA process for TMJ so that kʷikʷəƛ̓əm could be informed of the progress of the EA and could raise any issues to the EAO for discussion.

The EAO is of the view that it has approached consultation with kʷikʷəƛ̓əm with the intent to identify potential impacts and consider ways to address any potential TMJ-related impacts identified by kʷikʷəƛ̓əm to their Aboriginal Interests. This included meeting with kʷikʷəƛ̓əm and providing kʷikʷəƛ̓əm with the opportunity to provide feedback on the EAO's draft part C of the Assessment Report updates related to the BVSA, including the EAO's assessment on potential impacts to kʷikʷəƛ̓əm's Aboriginal Interests. The EAO notified kʷikʷəƛ̓əm regarding the public comment period for the EAO's BVSA-related updates to the Assessment Report for TMJ, and invited kʷikʷəƛ̓əm to review the draft report in advance of the comment period, including identifying any potential impacts to kʷikʷəƛ̓əm's Aboriginal Interests that were not adequately assessed or considered Part C.

15.3.3 POTENTIAL IMPACTS TO ABORIGINAL INTERESTS

The following sections focus on potential impacts of the Project to kʷikʷəƛ̓əm's Aboriginal Interests. A discussion of the EAO's assessment approach is provided in the EAO's Consultation Process Methodology section of Part C. The EAO considered information available, including from public sources as well as relevant issues raised by kʷikʷəƛ̓əm during the EA process, in the following assessment of the potential impacts of TMJ on kʷikʷəƛ̓əm's Aboriginal Interests

A. POTENTIAL IMPACTS ON FISHING

kʷikʷəƛ̓əm identifies itself as a fishing community, with members that have descended from ancestors known as skilled canoe builders, and master sturgeon and salmon fishers[342]. The EAO understands that salmon, from the Fraser and Coquitlam Rivers, were of great importance to the kʷikʷəƛ̓əm people; however, the construction of the Coquitlam Dam in 1904 led to the virtual extinction of the Coquitlam River sockeye salmon run[342]. kʷikʷəƛ̓əm identify that fishing is still a major occupation for its members, and kʷikʷəƛ̓əm currently maintains a DFO-licensed Fraser River salmon fishery for FSC purposes upstream of the proposed TMJ site, from Douglas Island to the Pattullo Bridge[328]. The EAO is aware that historically kʷikʷəƛ̓əm harvested salmon,

[342] kʷikʷəƛ̓əm. 2022. Our People. https://www.kwikwetlem.com/our-people.htm. Accessed April 8, 2022

sturgeon, eulachon, trout, catfish and carp in the Coquitlam, Fraser, and Pitt rivers[343]. Currently the south side of the Fraser River, between Pattullo and Golden Ears bridges, and the north Fraser River shoreline, from the Pitt River to New Westminster, are used for fishing for salmon, eulachon, and sturgeon by kʷikʷəƛ̓əm. Community members target several species of salmon (e.g., Chinook, chum, sockeye, Jack spring), steelhead, eulachon, sturgeon, cutthroat trout, brook trout, rainbow trout, carp, catfish, red-sided shiner, three-spine stickleback, and crayfish. Marine and freshwater shellfish gathered include freshwater clams and scallops. Drift nets, gill nets, dip nets, and hook and line are typically used for fishing.

The EAO understands through kʷikʷəƛ̓əm's submissions for the TMX federal panel review process, that the preservation, protection and revitalizing the health of the Fraser River, its tributaries and the fish, plants, birds, and other life that rely on it are of paramount importance to kʷikʷəƛ̓əm[344]. kʷikʷəƛ̓əm consider that the Fraser River and its tributaries provide critical habitat to numerous fish species still relied upon by kʷikʷəƛ̓əm members, and as stated by one of kʷikʷəƛ̓əm members – "these waters provide us food and work"[345]. kʷikʷəƛ̓əm identified that as "people of the river" the rivers and tributaries in kʷikʷəƛ̓əm territory provide kʷikʷəƛ̓əm with key locations for freshwater fishing and food collection, and other cultural activities (e.g., spiritual activities, gathering plants and medicines). The EAO is not aware that kʷikʷəƛ̓əm currently harvest in the lower Fraser River near the TMJ site.

The EAO evaluated the potential effects on fishing rights attributable to TMJ, which are summarized in Section 13.3.1 of Part C. The EAO is satisfied that the key impacts to biophysical components resulting in changes to fish quantity and quality, changes in access to fishing resources, and changes to social, cultural, and spiritual values associated with traditional fishing activities summarized in that section apply to kʷikʷəƛ̓əm. The following section focuses on the specific issues and potential impacts to the kʷikʷəƛ̓əm's Aboriginal right to fish.

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[343] BC Environmental Assessment Office (2017). Appendix C.01 – Kwikwetlem First Nation – Decision Materials for TMX Expansion Project. https://www.projects.eao.gov.bc.ca/api/public/document/58923186b637cc02bea16453/download/Appendix%20C.1%20-%20Kwikwetlem%20First%20Nation.pdf.

[344] Kwikwetlem First Nation. 2017. A85517-2 Kwikwetlem Regulatory Support Letter - A5T2A2. Accessed June 20, 2022.

[345] Kwikwetlem First Nation. 2015. C199-1-1 - Letter to Panel Seeking to File Late Evidence - A4S9A6. Accessed June 20, 2022.

- As described in the Accidents and Malfunctions section of Part B of this report, the EAO is satisfied that potential accidents and malfunction associated with TMJ have been adequately identified and assessed for this EA. The EAO concludes that impacts from potential accidents and malfunctions on environmental VCs, such as fish and fish habitat vegetation and wildlife and wildlife habitat, would be low to moderate. The EAO is recommending KMMs under CEAA 2012 for an Emergency Response Plan and a Marine Shipping Emergency Response Outreach Program. The EAO is also proposing conditions requiring the development of a CEMP and OEMP, which would include emergency response planning and spill prevention for the marine terminal area. The EAO notes that where monitoring or reporting would be required for conditions, these documents would be posted to the EAO's public website; and
- The EAO is recommending KMMs under CEAA 2012, including the Fish Mitigations to Reduce Harm and Mortality, Fish Habitat Offset Plan, and Vessel Traffic Management Plan and concludes that effects to fish and fish habitat from TMJ would not be significant within the LAA/RAA.

Conclusion

In consideration of the available information, the EAO's consultation with kʷikʷəƛ̓əm, kʷikʷəƛ̓əm's engagement with TJLP, TJLP's commitments, the EAO's proposed EAC conditions if an EAC is issued and the recommended KMMs under CEAA 2012, TMJ is expected to result in a **negligible-to-minor** impact on kʷikʷəƛ̓əm's right to fish.

The key factors that were considered in support of the EAO's conclusion on the impacts to the right to fish are summarized as follows:

Biophysical:

- The EAO's conclusions in the Fish and Fish Habitat in Part B that TMJ would have potential to result in low magnitude residual effects to fish and fish habitat at the TMJ site, and low magnitude residual effects to sturgeon from vessel strikes; and
- The lower Fraser River is highly industrial and the TMJ area is previously disturbed.

Geospatial (places, site, and access):

- The importance of fishing on the Fraser River and that kʷikʷəƛ̓əm members currently fish upstream of the TMJ site; and
- During construction (just over three years in duration) and operations (30 years minimum) Indigenous mariners and fishers would avoid entering and remaining in the marine terminal area and TMJ-related vessel activity may result in short-term, temporary disruptions to kʷikʷəƛ̓əm members traveling on the Fraser River within the

vicinity of the TMJ site.

Social, Cultural and Experiential:

- As outlined in the Current Use of Lands and Resources for Traditional Purposes section in Part B, potential negligible to low magnitude impacts to the change in noise and visual quality during construction and to changes in visual quality and potential concerns about safety during operations in the Fraser River; and
- Preservation, protection and revitalizing the health of the Fraser River, its tributaries and the fish, plants, birds, and other life that rely on it are of paramount importance to kʷikʷəƛ̓əm.

Mitigations:

- Proposed mitigations to reduce impacts to kʷikʷəƛ̓əm's right to fish include mitigations to reduce impacts to noise and visual quality in the CEMP and OEMP as well as the recommended key mitigations under CEAA 2012, specifically the Fish Mitigation to Reduce Harm and Mortality, the Fish Habitat Offset Plan, and follow-up programs, the Marine Communication Plan, the Marine Access and Transportation Plan and the Vessel Traffic Management Plan.

The EAO is aware that kʷikʷəƛ̓əm has a policy that there be no further loss of fish habitat, and that kʷikʷəƛ̓əm requests to be consulted regarding any specific losses of fish habitat and that all habitat compensation and mitigation Project options must be identified and agreed to by kʷikʷəƛ̓əm[341].

- The EAO's is recommending a KMM for the Fish Habitat Offset Plan, which would require TJLP to develop the plan in consultation with Schedule B Indigenous Groups, and to the satisfaction of Fisheries and Oceans Canada prior to construction. The EAO notes that the consultation requirements on the Fish Habitat Offset Plan (KMM) would not apply to kʷikʷəƛ̓əm as a Schedule C Indigenous Group for TMJ.
- During the EA, TJLP indicated that TMJ would support recovery of fish in the Fraser River by providing funding to the Indigenous-led FNFLF, of which kʷikʷəƛ̓əm is a participant, as described in Section 13.1 of Part C.

B. POTENTIAL IMPACTS ON HUNTING, TRAPPING AND GATHERING

The EAO is aware through kʷikʷəƛ̓əm's submissions on the TMX panel review process that, the south side of the Fraser River between the Pattullo and Golden Ears bridges is used for hunting deer, and the north Fraser River shoreline from the Pitt River to New Westminster is used for hunting deer, lynx, duck, beaver, geese, grouse, pheasant, mink, rabbit and bear[343]. The EAO is

also aware that plants, berries, and roots gathered are used by kʷikʷəƛ̓əm for food and medicinal purposes and wood and bark are harvested for both ritual and utilitarian objects, such as canoes, nets, baskets, and masks. Community members gather red cedar wood, bark and root, yellow cedar, cascara bark, yew wood and bark, Douglas fir, birch, cottonwood, cherry bark, crabapple, alder, sap, balsam, stinging nettle, cattail, salal, devil's club, Labrador tea, "frog leaf", salmon berries and shoots, huckleberry, cranberry, blueberry, blackberry, Saskatoon berry and wood, hazelnut, big leaf maple, Oregon grape, and Wapato, and most of these plants are collected from sloughs, riverbanks and upland environment The EAO is aware through kʷikʷəƛ̓əm's submissions on the TMX panel review process that, the south side of the Fraser River between the Pattullo and Golden Ears bridges is used for hunting deer, and the north Fraser River shoreline from the Pitt River to New Westminster is used for hunting deer, lynx, duck, beaver, geese, grouse, pheasant, mink, rabbit and bear[343]. The EAO is also aware that plants, berries, and roots gathered are used by kʷikʷəƛ̓əm for food and medicinal purposes and wood and bark are harvested for both ritual and utilitarian objects, such as canoes, nets, baskets, and masks. Community members gather red cedar wood, bark and root, yellow cedar, cascara bark, yew wood and bark, Douglas fir, birch, cottonwood, cherry bark, crabapple, alder, sap, balsam, stinging nettle, cattail, salal, devil's club, Labrador tea, "frog leaf", salmon berries and shoots, huckleberry, cranberry, blueberry, blackberry, Saskatoon berry and wood, hazelnut, big leaf maple, Oregon grape, and Wapato, and most of these plants are collected from sloughs, riverbanks and upland environment[343].

The EAO evaluated the potential effects on hunting, trapping, and gathering rights attributable to TMJ which apply broadly to Indigenous Groups. These potential effects are summarized in Section 13.3.2. The EAO is satisfied that the key impacts to biophysical components resulting in changes to wildlife and vegetation quantity and quality, changes in access to hunting, trapping and gathering areas, and changes to social, cultural, and spiritual values associated with traditional hunting, trapping and gathering activities summarized in that section apply to kʷikʷəƛ̓əm and kʷikʷəƛ̓əm did not raise specific issues and concerns with potential impacts of TMJ relating to hunting, trapping, and gathering, noting that the EAO added kʷikʷəƛ̓əm to Schedule C Indigenous Groups for TMJ in January 2022.

Conclusion

In consideration of the available information, the EAO's consultation with kʷikʷəƛ̓əm, kʷikʷəƛ̓əm's engagement with TJLP, TJLP's commitments, the EAO's proposed EAC conditions if an EAC is issued and the recommended KMMs under *CEAA 2012*, TMJ is expected to result in a **negligible** impact on kʷikʷəƛ̓əm's right to hunt, trap and gather.

The key factors that were considered in support of the EAO's conclusion on the impacts to the right to hunt, trap and gather are summarized as follows:

Biophysical:

- The EAO's conclusions at the TMJ site on adverse residual effects to wildlife and vegetation (see respective chapters in Part B) which indicate negligible to low magnitude residual effects on loss or alteration of wildlife habitat, sensory disturbance from noise and light, and mortality; as well as low magnitude residual effects on wetland and riparian ecosystems; and
- Terrestrial wildlife species of cultural importance Indigenous Groups have either not been found within the TMJ area or are not anticipated to be affected by the TMJ-related activities.

Geospatial (places, sites and access):

- Construction (just over three years in duration) and operation (30 years) is unlikely to cause disruptions to kʷikʷəƛ̓əm members access to areas traditionally used for hunting, trapping, and gathering activities at the TMJ site; and
- The upland portion of the TMJ site is situated on fee simple (private) land.

Social, Cultural and Experiential:

- Potential impacts to experience in the vicinity of the TMJ site due to a change in noise and visual quality (see respective chapters in Part B) during construction and operation which are anticipated to be negligible to low in magnitude in the Fraser River.

Mitigations:

Proposed conditions to mitigate impacts to kʷikʷəƛ̓əm's right to hunt, trap and gather are the vegetation and wetland management, wildlife and wildlife habitat management, light and noise management components of the CEMP and OEMP. The EAO is also proposing these mitigations as KMMs under *CEAA 2012* which would include the requirements for vegetation and wetland creation and restoration, lighting, noise and wildlife and wildlife habitat management and monitoring.

C. POTENTIAL IMPACTS ON OTHER TRADITIONAL AND CULTURAL INTERESTS

kʷikʷəƛ̓əm requires all professional archaeologists to apply for an HCA permit for any works, especially works that require ground disturbance within kʷikʷəƛ̓əm territory[346]. According to the KFNHP, kʷikʷəƛ̓əm asserts an inherent right to govern all lands, waters, and resources within its Territory, and seeks to protect, manage, and preserve heritage sites, heritage objects,

[346] kʷikʷəƛ̓əm. 2022. https://www.kwikwetlem.com/sumiqwuelu-riverview.htm. Accessed June 20, 2022.

heritage places and resources in its territory, according to traditional values and practices. kʷikʷəƛ̓əm are stewards of generations to come and hold a responsibility to protect, promote and enhance kʷikʷəƛ̓əm lands, resources, and culture in perpetuity.

The EAO is aware through kʷikʷəƛ̓əm's submission through the TMX federal review panel process, that as the "people of the river", the rivers and tributaries in kʷikʷəƛ̓əm's Territory provide kʷikʷəƛ̓əm people with key locations for spiritual activities, and other cultural activities (in addition to locations for plant and medicine collection, freshwater fishing, and food collection)[343]. kʷikʷəƛ̓əm have identified that these practices allow for the transfer of knowledge from one generation from the next.

The EAO evaluated the potential effects on other cultural and traditional interests attributable to TMJ, which apply broadly to Indigenous Groups. These potential effects are summarized in Section 13.3.3. The EAO is satisfied that the key impacts to biophysical, geospatial, and social, cultural, and spiritual values associated with potential pathways to effects to impacts to other traditional and cultural Aboriginal Interests that are summarized in that section apply to kʷikʷəƛ̓əm. kʷikʷəƛ̓əm did not raise specific issues and concerns with potential impacts of TMJ relating to its other cultural and traditional Interests with respect to the EA for TMJ, noting that the EAO added kʷikʷəƛ̓əm to Schedule C Indigenous Groups for TMJ in January 2022.

Conclusion

In consideration of the available information, consultation with kʷikʷəƛ̓əm, kʷikʷəƛ̓əm's engagement with TJLP, TJLP's commitments, the EAO's proposed EAC conditions if an EAC is issued, TMJ is expected to result in a **negligible** impact on kʷikʷəƛ̓əm's other traditional and cultural interests.

The key factors that were considered in support of EAO's conclusion on the impacts to other traditional and cultural interests are summarized as follows:

Cultural Heritage Resources:

- The EAO's conclusions in Heritage Resources chapter of Part B did not predict residual effects to Heritage Resources (Section 7.1) from erosion due to wake effects along the shorelines of the Fraser River in the RAA; and
- The lower Fraser River is highly industrial and the TMJ site is previously disturbed (this factor increases the seriousness of impact of TMJ).

Geospatial (places, sites, and access):

- Construction and operations are unlikely to cause disruptions to kʷikʷəƛ̓əm's access to cultural sites and uses by kʷikʷəƛ̓əm in the Fraser River area;
- The rivers and tributaries in kʷikʷəƛ̓əm territory provide key locations for spiritual and

other cultural activities; and

- The small number of TMJ-related vessels relative to current vessel traffic are predicted to have a negligible to low effect on cultural activities in the MSA area in terms of access from relatively infrequent and short duration disruptions to access due to the regularly occurring transit of vessels to and from TMJ's marine terminal area.

Social, Cultural, Experiential:

- The EAO's conclusions on Noise in Part B which found sensory disturbances from noise are anticipated to be negligible to low magnitude, temporary and short-term;
- The EAO's conclusions on Visual Quality in Part B which found a negligible to low impact to the existing visual landscape character in the Fraser River;
- The practice of cultural, traditional, and spiritual activities associated with rivers and tributaries allows for the transfer of knowledge from one generation to the next; and
- kʷikʷəƛ̓əm are stewards of generations to come and hold a responsibility to protect, promote and enhance kʷikʷəƛ̓əm lands, resources, and culture in perpetuity.

Mitigations:

- Proposed provincial conditions to mitigate impacts to cultural heritage are the development of the Cultural and Archaeological Resources Management Plan for the TMJ site, the Lighting Management, Noise and Vibration Management and Air Quality Management as part of the CEMP and OEMP as well as the Water Quality Management Plan and the Indigenous Cultural Awareness and Recognition Condition; and
- Heritage Conservation Act, (RSBC 1996, c. 182).

15.4 MÉTIS NATION BRITISH COLUMBIA

15.4.1 COMMUNITY PROFILE

Métis people are one of three "Aboriginal peoples of Canada" within the meaning of S. 35 (2) of the *Constitution Act*, 1982[347]. Métis people are descendants of unions between European men (explorers, fur traders and pioneers) and Aboriginal women that occurred in the eighteenth-century. Métis Nation British Columbia (MNBC) is the Métis governing body in BC that represents the interests of over 19,000 citizens in 40 Métis Chartered Communities from seven

[347] Métis Nation - Library and Archives Canada: https://www.bac-lac.gc.ca/eng/discover/aboriginal-heritage/metis/Pages/introduction.aspx (September 2020).

regions in the Province. MNBC indicates that it also represents the interests of nearly 90,000 self-identified Métis people in British Columbia. According to the *Métis Nation British Columbia's Consultation Guidebook*[348] the MNBC Ministry of Natural Resources will advocate and manage consultation, and where necessary consult directly with the Métis Chartered Communities. Since 2003 when the Métis leadership ratified the Métis Nation BC *Constitution*, MNBC has developed laws, regulations, and policies for maintaining, protecting, and furthering the Aboriginal Interests of Métis in British Columbia.

15.4.2 MÉTIS NATION BRITISH COLUMBIA'S INVOLVEMENT IN THE CONSULTATION PROCESS

The EAO sent a notification email to MNBC on May 6, 2015 noting that TMJ was to be subject to a provincial EA pursuant to the Act. As set out in section 14.2 of the Section 11 Order for TMJ, Section 5(e) of the EAO and the Agency's Memorandum of Understanding on Substitution of Environmental Assessments (2013) states that any consultation activities conducted with Métis or organizations representing Métis in British Columbia will be conducted on behalf of the Government of Canada and are not an acknowledgement by British Columbia that it owes a duty of consultation or accommodation to Métis in British Columbia under Section 35 of the Constitution Act, 1982.

The EAO set out its notification approach, consistent with opportunities provided to Indigenous Groups listed in Schedule C of the Section 11 Order for TMJ, in a letter to MNBC dated July 28, 2015. As specified in section 12.2 of the Section 11 Order, the EAO provided MNBC notification of, and relevant information at, key milestones during the EA process for TMJ so that MNBC could be informed of the progress of the EA and could raise any issues to the EAO for discussion.

The EAO issued the final AIR on November 29, 2016 and notified MNBC. The EAO initiated the 180-day Application Review period on March 20, 2019 and notified MNBC by email. The EAO also notified MNBC regarding the start of the public comment period for TMJ on March 26, 2019 and invited MNBC to review and comment on the Application and MNBC provided feedback the EAO on TJLP's Application. On June 5, 2020, the EAO invited MNBC to review the

[348] https://www.mnbc.ca/wp-content/uploads/2020/07/Consultation-Guidelines-Approved-FINAL-with-signature.pdf (Adopted June 2020)

EAO's draft Part C Assessment Report, including the EAO's draft assessment of potential impacts to Métis Nation British Columbia's Aboriginal Interests.

A summary of TJLP's engagement activities with MNBC is provided in the Application and in TJLP's Aboriginal Consultation Reports.

15.4.3 MÉTIS CONCERNS

MNBC reported that Métis have used, and continue to use, the area in and around the proposed TMJ site for traditional harvesting activities. MNBC told the EAO that the endangerment or destruction of harvest resources threatens Métis subsistence practices, and given the communal nature of Métis resource distribution, its impact is potentially widespread throughout the Métis community.

MNBC reported Métis harvesting salmon, ling cod, eulachon, sturgeon, Dolly Varden and halibut. Salmon remains the primary species harvested in sites along the Fraser River as well as the Ladysmith Harbour, Samsun Narrows and along the southwestern portion of Pender Island. Ling cod was harvested on the western side of the Strait of Georgia and south of Steveston Jetty. Eulachon, sturgeon, and Dolly Varden were harvested in Canoe Passage and in the lower Fraser River. MNBC reported Métis harvesting crab west of the Westshore Terminals, Sturgeon Bank, Boundary Bay and at various locations throughout the Gulf Islands. Also Métis harvested are prawns, clams, oysters, sea cucumber, sea urchin and squat lobster.

MNBC reported harvesting deer by Métis on Galiano Island and otter near the mouth of the Fraser River. Pacific Black Brant was reported to be harvested in Boundary Bay, Galiano Island, south of the BC Ferries Tsawwassen Terminal, the inter-causeway area and south of Brunswick point. Ducks and grouse were also harvested on Galiano Island. MNBC reported Métis gathering firewood used for fuel along the causeways for the Roberts Bank terminals and BC Ferries Tsawwassen Terminal as well as from the beach north of the Roberts Bank causeway.

MNBC also identified a number of Métis cultural sites including birth, death, burial and gathering sites primarily located in and around the Gulf Islands. Burial sites have previously been identified by MNBC representatives in the Strait of Georgia in the vicinity of Steveston Jetty.

MNBC raised the following concerns regarding TMJ:

- Concern regarding TMJ effects on benthic communities and fish in the vicinity of TMJ as MNBC noted that land use mapping data shows Métis use the proposed project area and shipping area for harvesting fish. MNBC was of the view that there was limited information on the benthic communities and noted that there was not sufficient

information to determine potential risk.

  - TJLP provided an overview of the benthic sampling program and assessment that was conducted for the Application and referenced the various documents that delineated the taxonomy of the benthic samples.
  - See Section 13.3.1 of Part C for a detailed discussion of the analysis and resolution of concerns related to impacts to fish and fish habitat. As discussed in that section, the EAO is recommending KMMs under CEAA 2012, including the Fish Mitigations to Reduce Harm and Mortality (which would include mitigations to limit in water works to least risk fish windows, or undertake additional mitigation measures as determined by a QP if works occur outside of these windows) and a Fish Habitat Offset Plan which would identify offsets that are greater and of higher fisheries value (higher productivity) than the habitat that would be directly lost by TMJ and include a monitoring program.

- Concern regarding TMJ effects on wildlife and vegetation in the vicinity of TMJ as MNBC noted that land use mapping data shows Métis use the proposed project area and shipping area for harvesting birds, mammals, invertebrates and plants.
  - See Section 13.3.2 for a detailed discussion of the analysis and resolution of concerns related to hunting, trapping and gathering. As discussed in that section, the proposed mitigation measures to address the effects of TMJ on wildlife and vegetation include the vegetation and wetland management, wildlife and wildlife habitat management, light management and noise management components of the CEMP and OEMP. These plans would reduce the impacts of visual, noise and air quality impacts to the experiential aspects of hunting, trapping, and gathering.
- Concern regarding TMJ effects on cultural sites in the vicinity of TMJ as MNBC noted that Métis have identified cultural sites within the proposed project area through mapping research.
  - See Section 13.3.3 for a detailed discussion of the analysis and resolution to concerns regarding access and use of cultural sites in the vicinity of TMJ. As discussed in that section, the proposed condition to mitigate for potential impacts to heritage resources is the Cultural and Archaeological Resources Management Plan which will involve TJLP addressing Indigenous concerns around access, both in terms of ensuring Indigenous access to sites during construction and prohibiting unauthorized access by the public.

Conclusion

In consideration of the information available to the EAO, the EAO's consultation with Métis Nation British Columbia, TJLP's commitments, the EAO's proposed EAC conditions if an EAC is issued and the recommended KMMs under CEAA 2012, the EAO is of the view that the concerns raised by the Métis Nation British Columbia in relation to TMJ have been adequately addressed.

16.0 SCHEDULE D: IMPACTS TO ABORIGINAL INTERESTS BY INDIGENOUS GROUP

16.1 MAA-NULTH FIRST NATIONS

16.1.1 COMMUNITY PROFILE

Since time immemorial, Maa-nulth First Nations continue to occupy and utilize resources located on and along the west coast of Vancouver Island. Maa-nulth First Nations culture is deeply rooted to the lands, waters and resources within their respective Hahoulthee (traditional territories) and guided by the core Nuu-chah-nulth principles of *ʔiisaak* (utmost respect), *ʔuuʔałuk* (taking care of) and *hišuk ma c̓awak* (everything is one). Nuu-chah-nulth culture includes matters relating to Maa-nulth First Nations history, feasts, ceremonies, naming of individuals, symbols, songs, dances, and stories. Citizens of Maa-nulth First Nations call themselves Maa-nulth-aht in their Nuu-chah-nulth language. Each of the Maa-nulth First Nations are also members of the Nuu-cha-nulth Tribal Council.

Maa-nulth First Nations are water people, with villages on the west coast of Vancouver Island that have existed there for thousands of years. To this end, the word "Maa-nulth" means "villages along the coast". Nuu-chah-nulth communities related to their territorial seas in the same manner as terrestrial communities relate to their lands, including an understanding of where to go to secure the necessary resources of life[349]. During historic times, it was often necessary for Nuu-chah-nulth people to forage in the marine environment using heavy wooden canoes[350]. Also prior to extensive logging in the area, large schools of salmon were recounted to

[349] The First Nations of Maa-nulth Treaty Society. Maa-Nulth-Aht: The Marine Economic Highway of a Water People. Shared with the EAO March 9, 2022.

[350] *Umeek* Atleo, E.R., 2004. *Tsawalk – A Nuu-chah-nulth Worldview*. UBC Press: Vancouver, BC. pp. 14.

occur off the historical salmon-bearing streams and rivers along the west coast of Vancouver Island (e.g., Kyuquot, Esperanza, Nootka Sound, Estevan, Raphael Point, Bear Island, Leonard Light) during the spring and summer[351]. Additionally, in February and March herring could be found spawning in large quantities in all the channels, bays, and inlets, and along the shores. In the fall, the Nuu-chah-nulth families commonly camped at mouths of streams and rivers to prepare smoked salmon for the winter[351].

The Maa-nulth First Nations are comprised of the following five distinct self-governing Treaty Nations that entered into the Maa-nulth First Nations Final Agreement ("Maa-nulth Treaty")[352], a modern comprehensive agreement concluded with Canada and British Columbia under the BC Treaty Commission process that took effect April 1, 2011: Huu-ay-aht First Nations, Ka:'yu:'k't'h'/Che:k'tles7et'h' First Nations, Toquaht Nation, Uchucklesaht Tribe, and Yuułuʔiłʔatḥ Government.

Huu-ay-aht First Nations territory is located in the Barkley Sound region on the west coast of Vancouver Island, at the entrance to Alberni Inlet. As of October 2021, Huu-ay-aht First Nations had a registered population of 725 people[353].

Toquaht Nation territory is located in and around Barkley Sound on Vancouver Island. As of October 2021, Toquaht Nation's registered population was 153 people[354].

Uchucklesaht Tribe territory is located is located in and around Barkley Sound on Vancouver Island. As of October 2021, Uchucklesaht Tribe's registered population was 243 people[355].

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[351] Ibid. pp. 98.

[352] Maa-nulth First Nations Final Agreement. 2008. https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/consulting-with-first-nations/agreements/final_maanulth.pdf

[353] Indigenous and Northern Affairs Canada. 2021. First Nation Profiles – Maa-nulth First Nations. Huu-ay-aht First Nations. https://fnp-ppn.aadnc-aandc.gc.ca/fnp/Main/Search/FNRegPopulation.aspx?BAND_NUMBER=663&lang=eng. Accessed November 9, 2021.

[354] Indigenous and Northern Affairs Canada. 2021. First Nation Profiles – Maa-nulth First Nations. Toquaht Nation. https://fnp-ppn.aadnc-aandc.gc.ca/fnp/Main/Search/FNRegPopulation.aspx?BAND_NUMBER=666&lang=eng. Accessed November 9, 2021.

[355] Indigenous and Northern Affairs Canada. 2021. First Nation Profiles – Maa-nulth First Nations. Uchucklesaht Tribe. https://fnp-ppn.aadnc-aandc.gc.ca/fnp/Main/Search/FNRegPopulation.aspx?BAND_NUMBER=667&lang=eng. Accessed November 9, 2021.

Yuułuʔiłʔatḥ Government (Ucluelet First Nation) territory is located in and around Barkley Sound on Vancouver Island. As of October 2021, Yuułuʔiłʔatḥ Government population was 674 people.

Ka:'yu:'k't'h'/Che:k'tles7et'h' First Nations' territory is located on the North Western section of Vancouver Island south of the Brooks Peninsula and North of Nootka Island. As of October 2021 Ka:'yu:'k't'h'/Che:k'tles7et'h' First Nations registered population was 582 people[356].

The Maa-nulth Treaty establishes government-to-government relationships between Canada, British Columbia (BC) and Maa-nulth First Nations based on mutual respect and sets out Maa-nulth First Nations rights and benefits respecting land and resources, and self-government over its lands and resources and its citizens. The Maa-nulth Treaty is a living agreement that provides certainty for all parties with respect to ownership and management of lands and resources and the exercise of federal, provincial and Maa-nulth First Nations governmental powers and authorities. As stated in the Maa-nulth Treaty, BC and Canada acknowledge the aspirations of Maa-nulth First Nations to preserve, promote and develop the culture, heritage, language and economies of the Maa-nulth First Nations and the Maa-nulth-aht to participate more fully in the economic, political, cultural and social life of BC in a way that preserves and enhances the collective identity of the Maa-nulth-aht as the Maa-nulth First Nations and to evolve and flourish as self-sufficient and sustainable communities. As set out in the Maa-nulth Treaty, Maa-nulth First Nations have a Treaty right to self-government; each Maa-nulth First Nations maintains their individual government structure, constitution, and the authority to make laws.

The Maa-nulth Treaty reflects that Maa-nulth First Nations have used, occupied, and governed their traditional territories from time immemorial and outlines all of the section 35 rights of each of the five Maa-nulth First Nations, including the right to harvest fish and aquatic plants (including intertidal bivalves), for FSC purposes in the Maa-nulth Domestic Fishing Area (MDFA). The Maa-nulth Treaty provides harvesting allocations for pacific salmon (chinook, Coho, pink, sockeye), herring, halibut, rockfish, groundfish, sablefish, and inter-tidal bivalves within the MDFA. The Maa-nulth Treaty also includes all marine animals in the definition of "fish"; as such, issues related to harvesting of marine mammals are considered in the potential impacts to fishing section. Maa-nulth First Nations also have a right to trade and barter resources harvested with other Maa-nulth citizens or Aboriginal groups and the Maa-nulth Treaty also

[356] Indigenous and Northern Affairs Canada. 2021. First Nation Profiles – Maa-nulth First Nations. Ka:'yu:'k't'h'/Che:k'tles7et'h' First Nations. https://fnp-ppn.aadnc-aandc.gc.ca/fnp/Main/Search/FNRegPopulation.aspx?BAND_NUMBER=638&lang=eng. Accessed November 9, 2021.

sets out the right for each of the Maa-nulth First Nations to benefit economically. As outlined in the Maa-nulth Fisheries Operational Guidelines, Maa-nulth First Nations Fish Allocation for Fraser sockeye salmon may be harvested outside of the MDFA in accordance with the Fraser Sockeye Salmon Workplan. More information about Maa-nulth First Nations fisheries is included in sections below.

Under the Maa-nulth Treaty, each of the Maa-nulth First Nations also has the right to harvest wildlife and migratory birds within the Wildlife Harvest Area and the Migratory Bird Harvest Area.[357] There are two Maa-nulth Bird and Wildlife Harvest Areas in Kyuquot Sound and Barkley Sound. The southeastern corner of those around Barkley Sound are adjacent to a small part of the MSA area.

The MSA noted that there are many sites of cultural importance to Maa-nulth First Nations located near the MSA area, but the locations of sites are not publicly reported. The MSA noted the traditional capital village of *Kiix?in*, a National Historic Site, is a Huu-ay-aht site of importance located just north of the MSA area.

16.1.2 MAA-NULTH FIRST NATIONS INVOLVEMENT IN THE CONSULTATION PROCESS

Consultation with Indigenous Groups identified in Schedule D began in July of 2019 when EAO sent a letter to these Schedule D Indigenous Groups inviting comments on the draft Section 13 Order, including consultation processes and opportunities. On August 6, 2019, at the request of Canada, the EAO issued a Section 13 Order to amend the geographic scope for the assessment of the marine shipping route and added the Indigenous Groups identified in Schedule D First Nations, which included Maa-nulth First Nations. For the review of the MSA, the EAO led consultation activities with the Indigenous Groups identified in Schedule D. The EAO invited Maa-nulth First Nations to participate in the Marine Shipping Working Group and met with Maa-nulth Treaty Society during the course of the MSA review.

As described in the community profile section above, the Maa-nulth Treaty establishes government-to-government relationships between Canada, BC and Maa-nulth First Nations based on mutual respect and sets out Maa-nulth First Nations rights and benefits respecting land and resources, and self-government. Maa-nulth First Nations and BC entered into a

[357] Maa-nulth First Nations Final Agreement Appendices. http://www.maanulth.ca/downloads/treaty/2009_maa-nulth_final_agreement_appendices_english.pdf

Reasonable Opportunity Agreement on May 22, 2014,[358] setting out a process through which the parties would fulfill the Treaty provisions that relate to ensuring that Maa-nulth First Nations are not denied a reasonable opportunity to harvest fish and aquatic plants within the MDFA by any authorizations made by BC. Based on information provided by Maa-nulth First Nations and the EAO's review of the Reasonable Opportunity Annual Reports and the MSA, the EAO understands that the marine shipping lanes do not overlap with areas identified as an "Important Harvest Area" under the Reasonable Opportunity Agreement but vessels from the project would pass through the MDFA.

Maa-nulth First Nations felt they encountered challenges with ensuring a sufficient level of consultation occurred during the EA with respect to the MSA for TMJ. Maa-nulth First Nations expressed concerns regarding the EAO's consultation process, including review timelines with short-notice, which is a challenge with limited internal capacity, especially during the COVID-19 pandemic. The EAO is of the view it has been responsive to Maa-nulth First Nations' concerns about the consultation process and based on discussion with Maa-nulth First Nations, extended the timeline for comment submission on the draft Assessment Report. The EAO understands that Maa-nulth First Nations appreciated the pause in the EA process for TJLP to provide additional information (i.e., the MSA review) and the small delay (11 days) to the start of the public comment of the EAO's draft Assessment Report at Maa-nulth First Nations' request. The EAO heard from Maa-nulth First Nations that even with the extensions, timelines remained a challenge given other active marine projects and the volume of information to review and also because Maa-nulth First Nations would traditionally spend the winter in the bighouse deliberating issues, which did not align with the timelines for TMJ.

During the MSA review, Maa-nulth First Nations raised concerns that the MSA should be scoped to 200 nm, including the MDFA (67 nm[359]); about the consultation process for the scoping decision; about the use of information from the RBT2 process; insufficient assessment of impacts due to LNG carrier spill or accident; and that cumulative impacts of development on the health of the ocean ecosystems should be included in the assessment. Maa-nulth proposed scoping the assessment to 200 nm for a variety of reasons, including language in CEAA 2012 referencing the EEZ and federal jurisdiction within the EEZ. Maa-nulth First Nations consider

[358] Maa-nulth First Nations and British Columbia Reasonable Opportunity Agreement. 2014. http://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/consulting-with-first-nations/agreements/maa-nulth_roa_side_agreement_signed_05_22_2014.pdf

[359] According to the Maa-nulth Treaty, the outer boundary of the MDFA (i.e., 67 nm) was negotiated as the approximate distance seaward at which Maa-nulth-aht standing in a *capac* (pronounced "chapuch"; canoe) could still see the mountain tops of the Vancouver Island mountain range.

marine shipping beyond 12 nm, and beyond 67 nm, has the potential to impact Maa-nulth First Nations and that scoping to 200 nm is necessary to ensure a fulsome assessment of those impacts. Maa-nulth First Nations also identified concerns about relying on information from the RBT2 reports, where Maa-nulth First Nation had identified gaps, including inadequate modelling of potential accidents and malfunctions. Further information related to concerns raised by Indigenous Groups with respect to scoping of the MSA and reliance on information from RBT2 and TMX processes is provided in Section 13.2 of this Report.

With respect to TJLP's original Application scenario, the EAO also understands that Maa-nulth First Nations considered that upstream GHG emissions should have been included in the EAO's conclusions on GHG management and that the no baseline case for upstream GHG emissions was unfounded given the uncertain economic viability of shipping that volume of LNG via truck and ISO container. The EAO acknowledges that Maa-nulth First Nations is concerned about the cumulative effects of GHG emissions from marine shipping and is of the view that any increase in GHG emissions from a major project such as TMJ is significant, given the current GHG emission levels and their resulting impact on climate change. With respect to TJLP's BVSA Report, the EAO understands that Maa-nulth First Nations requires more information to determine its perspective on the EAO's conclusions on the significance for cumulative effects of GHG management for TMJ.

The issue of direct GHG emissions from TMJ, and upstream GHG emissions – in addition to mitigations for direct emissions from TMJ – are addressed in the GHG management chapter in Section 5.2 of Part B of this Report. The EAO is proposing Condition 20: GHG Reduction Plan, which would require measures for TJLP to reduce GHGs, including development of triggers that would cause TJLP to take corrective action to reduce GHGs, and describe how TMJ would achieve any municipal, provincial, national, or international government GHG regulations or objectives that are made mandatory for TMJ. The EAO has reflected Maa-nulth First Nations' perspectives on the EAO's assessment of GHG management for TMJ in Section 13.2.3 of Part C.

Maa-nulth First Nations also submitted further information requests in accordance with their core principles *ʔiisaak* (utmost respect), *ʔuuʔałuk* (taking care of), and *hišuk ma c̓awak* (everything is one). Maa-nulth First Nations' information requests were related to their concerns about accidents and malfunctions, ship-sourced pollution, threats from invasive species, governance, stewardship, and potential impacts to Maa-nulth First Nations' Treaty rights and other interests, including rights to harvest species that utilize the Fraser River watershed. Maa-nulth indicated that, while the MSA reported TMJ vessels would not be expected to intersect both of Maa-nulth First Nations' northern and southern areas of the MDFA, Maa-nulth First Nations provided a map to the RBT2 Panel demonstrating container vessels travel through both the southern and northern fishing areas.

Maa-nulth First Nations also raised concerns that the MSA's cumulative effects assessment was weak and that proposed mitigations did not include any long-term investments by TJLP towards health of the ocean. During the EA, TJLP provided information related to their expected contractual arrangements for LNG vessels at the request of Maa-nulth First Nations. Also, Maa-nulth First Nations identified that, in order to advance reconciliation and the principles of the UN Declaration on the Rights of Indigenous Peoples and the TRC's Calls to Acton, Canada, BC and TJLP should engage with Maa-nulth First Nations on economic benefit sharing before decisions were made on whether or not to grant approvals for TMJ. As described in Section 13.1 of this Report, Maa-nulth First Nations considered TJLP's proposal for contribution to the FNFLF as not fulsome accommodation to TMJ's potential impacts to access.

The EAO met with the Maa-nulth Treaty Society and the EAO and Agency met several times by videoconference with Maa-nulth Treaty Society to discuss the responses to the information requests, provincial conditions, KMMs recommended under CEAA 2012, and the EAO's draft Assessment Report. The EAO coordinated a multi-agency videoconference between Maa-nulth First Nations, the EAO, the Agency, TC, DFO and the BC ENV to discuss potential for impacts to Maa-nulth First Nations from shipping-related introductions of aquatic invasive species. The EAO and Agency followed up on Maa-nulth's information requests through federal authorities on the Working Group to provide more detailed responses, identify key contacts with federal authorities, and to clarify or fact check information as required.
Maa-nulth First Nations told the EAO that a finding of residual effects should trigger a consent seeking process with Maa-nulth regarding proposed mitigation and accommodation measures. Maa-nulth First Nations requested that the EAO's referral materials reflect the concerns raised by Maa-nulth First Nations regarding regulatory gaps at the federal level (e.g., marine economics, marine invasive species, spill capacity and response regimes).

During the MSA review the EAO invited Maa-nulth First Nations to review and provide comments on the EAO's draft Assessment Report, including the EAO's conclusions on potential impacts to Maa-nulth First Nations Treaty rights and other interests and its views on adequacy of consultation. The EAO also invited Maa-nulth First Nations' feedback on the draft CPD, draft Certificate Conditions, and recommended KMMs under CEAA 2012. As outlined in the Section 13 Order for TMJ, the EAO provided an opportunity for Maa-nulth First Nations to submit their views regarding the draft Assessment Report should Maa-nulth First Nations disagree with the EAO conclusions or the way that the EAO has reflected the views of Maa-nulth First Nations in the referral materials. A description of EAO-led consultation activities with Indigenous Groups is provided in Section 12.4 of Part C.

Maa-nulth First Nations identified that the EAO's methodologies for the impacts assessment that are outlined in Section 12.2 of this Report, specifically the structure of the assessment, difficult to reconcile with their sacred principle *hišuk ma ćawak* (everything is one).

Maa-nulth First Nations also identified that the EAO's draft Assessment Report focused the narrative on specific treaty rights and did not reflect Maa-nulth First Nations worldview and lacked discussion or provided insufficient discussion of their concerns around accidents and malfunctions and the linkages between Maa-nulth First Nations territory and the impacts felt elsewhere in the lower mainland. Maa-nulth First Nations identified that previous concerns raised regarding the consultation process were not reflected and that the report did not tell the Maa-nulth First Nations story as Maa-nulth First Nations would.

Maa-nulth First Nations identified environmental, cultural, and economic interests with respect to potential impacts from TMJ, and that there were still outstanding questions and concerns across all three categories. Maa-nulth First Nations indicated a disagreement with the EAO's conclusion that TMJ would have negligible impact because there was the potential for significant cumulative effects to occur. Maa-nulth First Nations consider that the ecosystem is in a state of unbalance and additional incremental shipping would be significant. Maa-nulth First Nations emphasized that is critical that TMJ be operated as described in the impact assessment, and that the EAO's recommended Marine Access and Transportation Plan KMM under CEAA 2012, which specifies that, in each calendar year, the TMJ will receive a maximum of 365 LNG vessel calls, of which a maximum of 68 will be LNG carrier calls, would help to ensure this. The EAO also recognizes that there are outstanding impacts, in particular regarding cumulative effects, and these outstanding impacts are reflected in the EAO's conclusions in Part B and Part C for TMJ.

The EAO understands that during the MSA review TJLP participated in an information-sharing event with Maa-nulth First Nations, including topics such as shipping-related concerns, invasive species, and contracting arrangements. During the review of TJLP's BVSA Report, TJLP met with Maa-nulth First Nations to discuss the assessment for the BVS, and Maa-nulth First Nations participated in four of the Working Group meetings. During the Working Group meetings regarding the BVSA, Maa-nulth raised questions and concerns regarding potential effects of increased bunker traffic on the distribution of vessels in the MSA area, and to marine species that utilize the Fraser River watershed (e.g., SRKW and salmon) that are important to Maa-nulth First Nations, and questioned why cumulative effects were not assessed for the increased bunker vessel traffic.

- As described in Section 13.3.1.1 of Part C, the EAO did not assess for potential BVS-related impacts within the MSA because the BVS is not anticipated to affect the number of vessels in the MSA (see Section 2.2.2 of Part A for more details).

  The EAO did not predict any changes to its cumulative effects conclusions when comparing the BVSA to the Application scenario, considering the conservative nature of the assessment methods. While the EAO is of the view that the potential impacts

related from TMJ have been avoided, minimized, and accommodated to the extent possible for the purposes of the EA, the EAO also recognizes that there are outstanding impacts, in particular cumulative effects, and these outstanding impacts are reflected in the EAO's conclusions, including the EAO's conclusions on the fishing component of Current Use of Resources and Lands for Traditional Purposes, and on Indigenous cultural heritage use of SRKW (see Section 11.4 of Part B).

Maa-nulth First Nations' Separate Submissions to Ministers and Letters of Consent

On July 29, 2022, the EAO received letters from each of the five Maa-nulth First Nations communities (dated October 25, 2021) advising the EAO that, based on commitments made by TJLP, each community consents to the granting of any authorizations or permits necessary for TMJ. Based on the letters, the EAO understands that Maa-nulth First Nations consider consultation for TMJ has been fulfilled, and that Maa-nulth First Nations will continue to participate in the EA and other regulatory processes in a manner that is consistent with its consent for TMJ and does not take the position that the Crown's duty to consult and accommodate has not been met.

The EAO also received a separate submission (dated August 15, 2022) from Maa-nulth First Nations, which identified that Maa-nulth First Nations have worked closely with TJLP on this project, and, because of those discussions, Maa-nulth First Nations consent to TMJ as described in the impact assessment. Maa-nulth First Nations states that its consent is, however, subject to its ongoing participation in any permitting processes for TMJ. Maa-nulth First Nation also provided its proposed additional accommodations in relation to TMJ and other marine shipping projects, which mirror Maa-nulth's proposed additional accommodation in the RBT2 impacts assessment. The EAO included Maa-nulth First Nations' five individual letters of consent (dated October 25, 2021) and Maa-nulth First Nations' separate submission (dated August 15, 2022) in the referral package for decision makers at time of referral.

The EAO is of the view that it has approached consultation with Maa-nulth First Nations at the deeper end of the spectrum, with the intent to identify potential impacts and consider ways to address any potential impacts to Aboriginal Interests that were identified by Maa-nulth First Nations within the MSA area. The Maa-nulth Treaty outlines the consultation requirements for federal and provincial environmental assessments under sections 22.2 and 22.3, respectively. With respect to the MSA analysis of TMJ, the EAO is of the view that it has fulfilled BC's obligations in relation to Provincial Projects as set out in paragraph 22.3.1 of the Maa-nulth Final Agreement by ensuring Maa-nulth First Nations were: a) provided with timely notice of, and relevant available information; b) consulted regarding the potential environmental effects; and c) received an opportunity to participate in the environmental assessment. Also, in accordance with paragraph 22.3.2 of the Maa-nulth Final Agreement, the EAO is of the

perspective that it has provided substantial responses to views provided by Maa-nulth First Nations during the MSA for TMJ.

The EAO is also of the view that, through Substitution, it has carried out consultation in accordance with paragraph 22.2.2 of the Maa-nulth Final Agreement, which sets out requirements related to Federal Projects. During the MSA for TMJ, the EAO ensured Maa-nulth First Nations were provided an opportunity to comment on the MSA conducted under CEAA 2012, including scope of the assessment, environmental effects and any mitigation measures or follow-up programs to be implemented. The EAO is of the perspective that Maa-nulth First Nations were given full and fair consideration to any comments made throughout MSA of TMJ, and the EAO and the Agency have been responsive to the comments, before making any decisions to which those comments pertain.

16.1.3 POTENTIAL IMPACTS TO TREATY RIGHTS AND OTHER VALUES

The following sections focus on potential impacts of TMJ to Maa-nulth First Nations' Treaty rights and other values. A discussion of the EAO's assessment approach is provided in the Impacts Assessment Methods section of Part C. Maa-nulth First Nations expressed concern that EAO's methods for assessment of potential impact to Maa-nulth First Nations' Treaty Rights did not reflect recognition of use and occupation nor economic or governance interests that stem from those rights under the Maa-nulth Treaty. The EAO would like to clarify that consideration of use and occupation as described in Section 12.2 is related to assessment of asserted Aboriginal title claims, not established Treaty rights. The EAO's assessment of potential impacts to Maa-nulth First Nations' established Treaty rights are provided below and the EAO believes the methods used were consistent with the Maa-nulth Treaty.

The EAO considered information available, including from public sources as well as relevant issues raised by Maa-nulth First Nations and citizens during the EA process (in meetings, letters and Working Group comments), in the following assessments of the potential impacts of TMJ on Maa-nulth First Nations Treaty rights and other interests. The following sections focus on potential impacts of TMJ to Maa-nulth First Nations based on the EAO's assessment, and mitigations and accommodations to address potential impacts to their Treaty rights. It is important to note that as the EAO developed this report, its reflection of Maa-nulth First Nations worldview, values and culture is limited to the written information available to the EAO and what was heard during the consultation process.

A. POTENTIAL IMPACTS ON RIGHT TO HARVEST FISH AND AQUATIC PLANTS

The Maa-nulth Treaty provides harvesting allocations for pacific salmon (chinook, Coho, pink, sockeye), herring, halibut, rockfish, groundfish, sablefish, and intertidal bivalves within the

MDFA. The Maa-nulth Treaty also includes all marine animals in the definition of "fish"; as such, issues related to harvesting of marine mammals are considered in this section. As outlined in the Maa-nulth Fisheries Operational Guidelines, Maa-nulth Fish Allocation for Fraser sockeye salmon may be harvested outside of the MDFA in accordance with the Fraser Sockeye Salmon Workplan. There are eight Maa-nulth intertidal bivalve harvesting areas, all of which are outside of the MSA RSA.

Maa-nulth First Nations also have a right to trade and barter resources harvested with other Maa-nulth members or Aboriginal groups and the Treaty also sets out the right for each of the Maa-nulth First Nations to benefit economically through such opportunities as commercial fishing licences, communal commercial bivalve harvesting, or operating shellfish aquaculture tenures, for example. Outside of the Treaty, Maa-nulth First Nations also hold commercial fishing licences in accordance with a Harvest Agreement and commercial shellfish aquaculture tenures. The EAO understands that Maa-nulth First Nations fishers and harvesters use small vessels for access to or harvesting from nearshore areas. In addition to those species mentioned above, the EAO understands that Maa-nulth First Nations harvest tuna, which is caught in the summertime. To access fishing or harvesting locations further offshore, Maa-nulth First Nations citizens use larger vessels and the EAO understand that Maa-nulth First Nations considers all of the MDFA as important areas for fishing, including Swiftsure Bank and La Perouse Bank. The EAO heard from Maa-nulth First Nations that Swiftsure Bank represents a pinch point due to the levels of vessel traffic in the outbound shipping lane that overlaps the area.

During the MSA review, TJLP produced a figure for the MSA that predicted an overlap of two percent between the MSA area and the southern (i.e., Barkley Sound) area of the MDFA, which includes Swiftsure Bank (Figure 22). The shipping lanes go through a portion of the MDFA and beyond 12 nm the trans-oceanic traffic would continue through the MDFA following similar routes, but the vessels can take variable courses (i.e., not constrained by the shipping lanes but navigating under the collision regulations). According to the figure, if TMJ-related LNG carriers followed the typical great circle route to Asia, then the vessels would only transect the southern Barkley Sound area of the MDFA, and not enter the northern Kyuquot Sound area. As shown in the figure, the projected markets for bunker vessels are along the west coast of the US, so bunker vessels would track south as soon as they leave the Strait of Juan De Fuca. As the BVSA contemplates an increase in local bunkering and no changes to export routes, the shipping routes described in the MSA and the figure have not changed. Maa-nulth First Nations stated that reporting a small percentage of overlap served to minimize the potential for impacts to Maa-nulth First Nations' fishing rights, and that the assessment's suggestions on the proposed shipping routes was not supported by evidence.

Maa-nulth First Nations shared a map that was submitted by Maa-nulth First Nations through the RBT2 Panel process showing container vessel traffic traverses through both the southern (i.e., Barkley Sound) and northern (i.e., Kyuquot Domestic Fishing Areas) of the MDFA[360]. The report assesses the container traffic through MDFA direct from and to Deltaport Terminal from Jan 2018 – Dec 2018 based on both satellite- and terrestrial-based Automatic Identification System (AIS) data. The report showed that a proportion of Deltaport Terminal container vessel traffic travelled through both Barkley and Kyuquot Sound fishing areas, but the majority of vessel traffic followed the typical great circle track to Asia. Maa-nulth First Nations identified that the data used to produce that map does not distinguish between inbound and outbound traffic, and they have not been provided data specific to LNG carriers which suggest an outbound route outside of their MDFA.

The EAO understands, based on information provided through the RBT2 Panel process by Maa-nulth First Nations, that container vessel traffic can take alternative routes, resulting in some vessels travelling through both of the southern Barkley Sound and norther Kyuquot Sound Domestic fishing areas of the MFDA. The EAO understands that the factors controlling global trade patterns are complex, resulting in some degree of uncertainty in predicting the extent to which TMJ-related LNG carriers would traverse through Maa-nulth First Nations' southern and northern fishing areas in the MDFA beyond the 12 nm.

[360] National Strategies – Marine GeoAnalytics. 2019. Container Traffic Analysis as part of RBT2 Undertaking #62. https://www.ceaa-acee.gc.ca/050/evaluations/document/130693

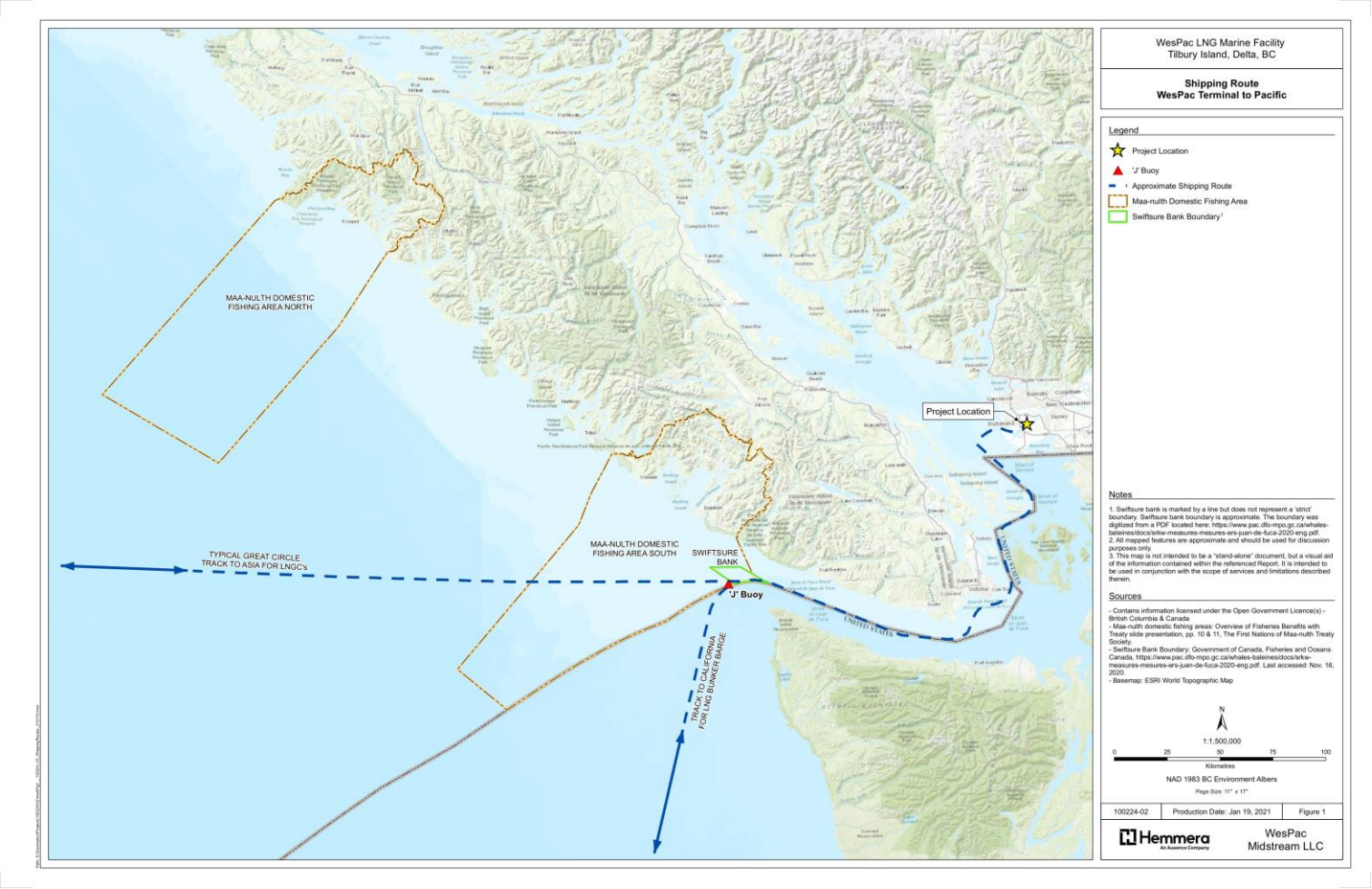

Figure 22: Locations of Maa-Nulth First Nations southern Barkley and northern Kyuquot Sounds areas within the Maa-nulth Domestic Fishing Area

*Note Figure 22 does not show the most direct great circle track to Asia, please see text above for more details.

- In the Current Use of Lands and Resources for Traditional Purposes and Cultural Heritage assessment in Part B the EAO concluded that TMJ-related vessels would cause negligible to low magnitude residual effects due to TMJ-related vessel traffic during operations affecting access, visual quality, noise, and vessel wake (with an increasing magnitude of effect the closer one is to the vessels). While the EAO understands there is some degree of uncertainty associated with predicting the TMJ-related LNG carrier vessel routes beyond 12 nm, the EAO acknowledges that similar effects due to TMJ-related marine shipping affecting access, visual quality, noise, and vessel wake may occur beyond 12 nm in either the southern or northern fishing areas of the MDFA. The EAO considers that TMJ's contribution to international vessel traffic bound for Asia would be relatively limited (i.e., the MSA estimated 68 LNG carriers calling on the jetty, resulting in 136 inbound and outbound trips annually). The EAO is proposing a KMM under CEAA 2012 for TMJ to develop a Marine Communication Plan for TMJ (from the jetty out to 12 nm), in consultation with Indigenous Groups, including procedures to inform Indigenous Groups of traffic schedules, for Indigenous Groups to submit any feedback on potential adverse effects on navigation as a result of TMJ, and for TJLP to document and respond to any feedback received in a timely manner

During consultation, Maa-nulth First Nations expressed to the EAO that their culture is rooted in their lands, waters and resources and any harm to these would be an adverse impact to their culture. The EAO understands that Maa-nulth First Nations need access to their traditional territories to conduct marine harvesting as this is integral to their way of life. Additionally, Maa-nulth First Nations identified that the expression of their culture and traditions in a meaningful way honours their core Nuu-chah-nulth principles as well as their ancestors.

Maa-nulth First Nations identified main threats to their way of life and existence as a distinct peoples, which include continued industrialization of the Salish Sea, ongoing decline of both local forestry and fisheries economies and ongoing alienation from natural resources without benefit to their communities. Maa-nulth First Nations described salmon as essential to their culture and explained the importance of salmon fishing to their communities, and there is a connection to the Fraser River through the salmon and steelhead that is harvested by Maa-nulth First Nations. Maa-nulth First Nations also encounter White sturgeon from time to time, but they have indicated that the natal stream is unknown, and they feel it warrants further genetic study. Maa-nulth First Nations expressed concerns about the cumulative effects of marine shipping on fish and fish habitat, including effects to fish habitat due to piles, dredging, vibrodensification and scour protection at marine terminal area and changes in fish behaviour due to underwater noise during construction or mortality to sturgeon due to vessel strikes. Maa-nulth First Nations also expressed concerns about the cumulative effects of the

marine shipping industry on their treaty rights, interests, culture and wellbeing and are of the view that any impact due to marine shipping is significant, given the volume of existing and proposed future vessel traffic through the Maa-nulth Domestic Fishing Area.

- The EAO appreciates Maa-nulth First Nations governance and stewardship of the lands and waters. The EAO understands that Maa-nulth First Nations have strong connections to the marine environment in the Salish Sea, which are connected to watersheds supporting Maa-nulth First Nations fisheries;
- The EAO understands that Maa-nulth First Nations disagreed with the EAO's conclusions on the significance for cumulative effects to fish and fish habitat and Indigenous health and wellbeing for TMJ; and
- The EAO evaluated the potential effects on fishing rights attributable to TMJ as summarized in Section 13.3.1, which included considering the potential pathways of effects based on review of information from the RBT2 process and TMX. The EAO is satisfied that the key impacts to biophysical components resulting in changes to fish quantity and quality, changes in access to fishing resources, and changes to social, cultural, and spiritual values associated with traditional fishing activities are summarized in Section 13.3.1, and would apply to Maa-nulth First Nations. The EAO concludes in the Fish and Fish Habitat chapter of Part B (Section 5.6) that residual effect from TMJ on fish and fish habitat would not be expected in MSA RSA.

The EAO heard from Maa-nulth First Nations that a there is a 'fear factor' associated with use of the marine environment that exists in their communities, especially because citizens may not have technologies onboard their vessels for marine situational awareness when accessing fishing areas. This is particularly concerning on inclement weather days, or in the event a dense fog can roll in on the water reducing visibility for Maa-nulth First Nations harvesters. The EAO notes information in the RBT2 panel report where Maa-nulth First Nations raised safety concerns for fishers travelling in smaller vessels when encountering larger vessels. Maa-nulth First Nations told the EAO that they are engaged in various initiatives provided through the Canada's Ocean's Protection Program for capacity building in marine safety, but the COVID-19 pandemic and overlapping timeframes has made meaningful engagement in all of the various programs challenging. Also, despite these challenges, Maa-nulth First Nations continue to try to engage in all relevant regional initiatives.

- The EAO considers that the safety of small vessels with large vessels and wake effects were assessed in the Accidents and Malfunctions Section of Part B and that the regular and relatively short-duration passage of TMJ-related vessels would include monitoring of compliance with maritime regulations and legislation such as the Canada Shipping Act and the Collision Regulations;
- TJLP has stated that TMJ's influence on TMJ-related vessel operations would be

limited beyond TMJ's marine terminal area (including the location and operation of international shipping lanes), but TJLP has committed to a Marine Communication Plan out to 12 nm that would be developed in consultation with Schedule B and D Indigenous Groups and include a communication procedure to inform Indigenous Groups of vessel schedules and provide a complaint submission process; and

- The EAO acknowledges Maa-nulth First Nations worldview and perspective that harvesters find the presence and sounds of LNG carriers disturbing for safety and/or aesthetic reasons and that may result in a loss of opportunity to harvest or reduce quality of experience while harvesting or have potential impacts to knowledge and language transmission; The EAO also considers that the TMJ-specific mitigation measures would not reduce impacts to safety concerns and quality of experience because some Indigenous people may find the presence and sounds of LNG carriers disturbing for safety and/or aesthetic reasons, or for other reasons.

Additional concerns raised by Maa-nulth First Nations regarding potential impacts on the right to fish due to TMJ are provided below. Maa-nulth First Nations informed the EAO that the concerns shared over the course of the EA were not exhaustive:

- During the course of the MSA, Maa-nulth First Nations stated they are very concerned about the cumulative impacts of development on the health of the ocean and that the collapsing steelhead, chinook and resident killer whale populations are signs of an imbalance in the marine environment. As such, they noted that any potential for cumulative effects should be thoroughly assessed and responded to prior to a decision being made on TMJ. Maa-nulth First Nations also noted that the ecosystem is in a state of unbalance and that additional incremental shipping from TMJ would be cumulatively significant.
    - The EAO concluded in the Marine Mammals section of Part B that TMJ would result in low to moderate magnitude residual effects on marine mammals and significant cumulative effects to SRKWs due to underwater vessel noise. The EAO is recommending as KMMs under CEAA 2012 for a Vessel Traffic Management Plan that would require TJLP to incorporate contractual measures to support participation of TMJ-related vessels in the VFPA-led ECHO Program seasonal slowdown initiatives (as amended) or a future equivalent and annual reporting on TJLP's participation in regional environmental management measures and cumulative effects monitoring to protect SRKW, where feasible. The seasonal slowdown initiatives currently request vessels to slow down in key SRKW foraging areas such as Swiftsure Banks, and Boundary Pass. See Section 13.3.3 for a detailed discussion of the analysis and resolution of concerns related to the effects on whales.

  - The EAO understands that Maa-nulth First Nations have strong connections to the marine environment in the Salish Sea, which are connected to watersheds supporting Maa-nulth First Nations fisheries. The EAO appreciates Maa-nulth First Nations governance and stewardship of the lands and waters. The EAO notes that the existing regional Government of Canada initiatives in Section 13.1.1 are available to support Indigenous groups to undertake stewardship activities and improve the understanding of environmental and cumulative effects in the Salish Sea. The EAO notes that these programs are broad in nature and are not intended to mitigate or accommodate for the specific potential impacts to Indigenous mariners and fishers navigating in proximity to TMJ vessels within the established Traffic Separations.
  - As discussed in Section 13.3.1, the proposed mitigation measures to address potential impacts to fish are included in the EAO's proposed key mitigation under CEAA 2012, including Fish Mitigations to Reduce Harm and Mortality, and Fish Habitat Offset Plan. Of note, the monitoring and mitigation plan would include monitoring for in-water works occurring outside of the DFO fisheries window to support the implementation of mitigation and monitoring for eulachon, salmon species and species at risk prior to initiation of works outside of the instream work window. The EAO did not predict residual impacts to fish or fish habitat from TMJ in the MSA RSA.

- Maa-nulth First Nations expressed concerns that invasive species represent a threat to their territories, having already experienced issues with invasive green crab. Maa-nulth First Nations are concerned that increases in marine shipping in their territory will increase the risk of pollution and also terrestrial (e.g., giant Asian hornet) or marine invasive species introductions. Maa-nulth First Nations sought clarity on the roles and responsibilities related to the management of invasive species, including what are the rules and requirements with respect to hull cleaning, anti-fouling systems and propellor maintenance. Maa-nulth First Nations wanted to further understand what the Crown expected that TJLP's commitments should be to reduce spread of invasive species in the MSA. Maa-nulth First Nations requested clarification on the current management regime at the federal level, including identifying what are the gaps, how can these gaps be filled, and what is the role of Maa-nulth in the management for reducing invasive species?
  - The EAO understands that TC's role is prevention of introductions of aquatic invasive species, while DFO's role is in managing invasive species through leading programs and initiatives to reduce or manage the impacts of those invasive species that have already become established. The EAO notes the provincial

government (e.g., BC ENV, BC AGRI, FLNRORD) have a role in managing terrestrial, and to a lesser extent aquatic, invasive species, which includes engagement through Inter-Ministry Invasive Species Working Groups under the *Invasive Species Strategy for BC* (2018 – 2022)[361].

- With respect to preventing the introductions of aquatic invasive species through ballast water, the *International Convention for the Control and Management of Ships' Ballast Water and Sediments* was introduced by the International Maritime Organization (IMO) and came into force in September 2017[362]. TC confirmed that all new vessels would be built to meet these standards, including on-board equipment to ensure the IMO standards established in the convention are met. TC recognized that it is not possible to get completely 100 % reduction, but standards are set scientifically to minimize the risks of aquatic invasive survival as outlined in the convention.
- TC has developed a new Ballast Water Regulations under the *Canada Shipping Act, 2001* to bring the IMO Convention into force in Canada. TC identified that the new Ballast Water Regulations were developed in consideration of Canada's unique coastline and will require ships to complete mid-water ballast exchange at least 200 nm from shore and within minimum water of a depth of 2000 m and Canada has been recognized as a world leader this area. The EAO considers that the potential introduction of invasive species from ballast water discharge would be sufficiently managed through adherence to federal regulations.
- Through dialogues, Maa-nulth First Nations identified a concern that under some circumstances, due to safety, vessels may be required to undertake a ballast water exchange in alternatively designated areas within Canada's EEZ, but it was unclear if those designated areas would overlap with, or would be nearby to, their MDFA. TC committed to following up with Maa-nulth First Nations with additional information around the locations of the designated alternative

[361] Inter-Ministry Invasive Species Working Group. 2014. Invasive Species Strategic Plan. https://www2.gov.bc.ca/assets/gov/environment/plants-animals-and-ecosystems/invasive-species/guidance-resources/prov_is_strategy.pdf

[362] International Maritime Organization. International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM). https://www.imo.org/en/About/Conventions/Pages/International-Convention-for-the-Control-and-Management-of-Ships%27-Ballast-Water-and-Sediments-(BWM).aspx

exchange sites.

- With respect to biofouling, Canada recognizes that biofouling is a vector for the potential transfer of aquatic invasive species and that the introduction of these species threatens the conservation and sustainable use of biological diversity. In Canada, biofouling management falls under the responsibility of multiple federal government departments as well as provincial and territorial governments. Domestically, in terms of federal departments, DFO currently regulates biofouling of vessels under 24 m through the Aquatic Invasive Species Regulations. TC, under the *Canada Shipping Act, 2001*, does have the authority to create regulations that apply to vessels over 24 m in length and that would aim to prevent or reduce the release of aquatic organisms or pathogens via hull fouling. Such regulations are currently not in place. However, efforts are underway in identifying best practices, challenges and measures with aim of developing a policy framework in regard to ships biofouling, including in water cleaning. The IMO adopted the *2011 Guidelines for the Control and Management of Ships' Biofouling to Minimize the Transfer of Invasive Aquatic Species*[363], which TC is currently reviewing. Through these conversations, TC identified a possible opportunity for Maa-nulth First Nations to engage through upcoming public review of a draft voluntary guidance document on in-water cleaning of vessel hulls greater than 24 m that TC is currently working, which includes best practices relevant to authorities, including ports, to help decide if they should allow in-water cleaning of vessels over 24 m and outline best practices to mitigate risks associated with these activities. The guidelines consider hull cleaning as an effective activity and important means to manage biofouling, provided it is conducted properly as the activity does present biosecurity and water quality risks due to buildup of persistent chemicals from antifouling paint in the substrate below.

Information and follow-up related to Maa-nulth First Nations' other information requests are provided in sections to follow.

[363] Resolution MEPC.207(62). 2011. https://wwwcdn.imo.org/localresources/en/KnowledgeCentre/IndexofIMOResolutions/MEPCDocuments/MEPC.207(62).pdf.

Conclusion

The EAO predicts that TMJ-related marine shipping effects would have a **negligible-to-minor** impact on Maa-nulth First Nations' right to harvest fish and aquatic plants. The EAO considers TMJ-related increases to vessel traffic during operations would be incremental compared to existing baseline conditions of the established Traffic Separation Scheme of the Salish Sea. However, in consideration of the available information; the EAO's consultation with Maa-nulth First Nations; Maa-nulth First Nations' engagement with TJLP; TJLP's commitments; and the EAO's proposed EAC conditions if an EAC is issued and the recommended KMMs under CEAA 2012, the EAO concludes that TMJ-related marine shipping effects combined with cumulative effects in the MSA area is expected to result in **minor-to-moderate** impact on Maa-nulth First Nations' right to harvest fish and aquatic plants for domestic purposes.

The EAO predicts that TMJ-related shipping activities during operations would interact with current baseline levels of cumulative effects to access to fishing areas and the experience of fishing in, or adjacent to, the shipping lanes. These cumulative effects in the MSA area combined with the importance of Maa-nulth First Nations' right to harvest fish and aquatic plants. The EAO understands that Maa-nulth First Nations disagree with the EAO's determination of not significant conclusions to the fishing component of Maa-nulth First Nation's Current Use of Lands and Resources for Traditional Purposes, and that Maa-nulth First Nations told the EAO that their Treaty rights are not dependent on current use, and residual effects to Maa-nulth First Nations extend beyond defined shipping lanes.

Maa-nulth First Nations told the EAO that their views on the impact levels should be reflected in the report and that Maa-nulth First Nations considers the declining fish stocks and Northern and SRKW populations suggest the marine environment is reaching its threshold, such that Maa-nulth First Nations considers any additional effects on a right or interest linked to the marine environment are significant. Maa-nulth First Nations identified significant cumulative effects given the number of vessels already passing through Maa-nulth First Nations' waters, including Swiftsure Bank and other fishing areas within or adjacent to marine routes beyond the MSA area, include La Perouse Bank.

- The EAO considered Maa-nulth First Nations' perspectives on cumulative effects and Maa-nulth First Nations' ability to meaningfully practice their fishing rights in the MSA area. The EAO acknowledges that there are already vessels transiting the shipping lanes which can impact Indigenous fishers' access to and quality of experience of fishing. While the EAO recognizes there is some uncertainty when considering how cumulative effects impact Aboriginal Interests and practice of Treaty Rights, the EAO agrees with Maa-nulth First Nations, that any increase in vessel traffic at fishing areas within or

adjacent with marine shipping routes would potentially be more serious when combined with past, present, and reasonably foreseeable shipping activities.

The key factors that were considered in support of the EAO's conclusion on the potential impacts to Maa-nulth First Nations rights to harvest fish and aquatic plants for domestic purposes are summarized as follows:

Biophysical:

- The EAO's conclusions in the Fish and Fish Habitat chapter in Part B do not predict any residual or cumulative effects to fish and fish habitat in the MSA area;
- The EAO's conclusions in the Marine Mammals chapter in Part B do not predict any significant residual or cumulative effects to marine animals harvested by Maa-nulth First Nations in the MSA area, as identified in the Maa-nulth Treaty;
- The MSA area, including Swiftsure bank, is a heavily utilized marine environment with occasionally high levels of marine traffic in the shipping lanes;
- Maa-nulth First Nations view the cumulative effects from TMJ to their treaty fishing rights as significant given the number of vessels already passing through Maa-nulth First Nations' waters; and
- Maa-nulth First Nations identified significant cumulative effects given the state of the marine environment (i.e., declining fish stocks and southern and norther resident killer whale populations).

Geospatial (places, sites, and access):

- Shipping lanes cross the southern limits of the MDFA in the Barkley Sound Domestic fishing area (including Swiftsure Bank) within the MSA; beyond the MSA trans-oceanic traffic continues through the MDFA following similar routes, but the vessels can take variable courses (i.e., not constrained by the shipping lanes but navigating under the collision regulations);
- Maa-nulth First Nations identified the entire MDFA as an important fishing area, including La Perouse Bank and Swiftsure Bank; Swiftsure bank is intersected by shipping lanes where cumulative effects from shipping traffic is a constraint;
- The EAO does not anticipate any disruptions to access to terrestrially based aquatic plant harvesting activities (i.e., there are no anticipated interactions between shipping and shore-based harvesting); and
- The EAO considers TMJ would result in an incremental increase (i.e., 0.2 – 1.1 % for

segments A – D) in vessel traffic when compared to baseline conditions in the Traffic Separation Scheme and that TMJ-related vessel transits during operations (minimum 30 years) would result in negligible to low magnitude effects due to relatively infrequent and short-duration disruptions to access to fishing areas in the Salish Sea.

Social, Cultural and Experiential:

- Harvesting fish and aquatic plants is integral to the culture of Maa-nulth First Nations, and Maa-nulth First Nations have the right to harvest fish and aquatic plants for FSC purposes. Each Maa-nulth First Nations has the right to trade, barter and sell fish in the commercial marketplace[364];
- Maa-nulth First Nations are already experiencing stress from marine shipping projects, and are of the view the cumulative effects from TMJ to their culture, wellbeing, trade and bartering rights as significant;
- The importance of salmon fishing to Maa-nulth First Nations communities and the cumulative impacts of development on the health of the ocean and that the collapsing ecosystem are signs of an imbalance in the marine environment;
- Potential negligible to low impacts due to incremental increases from TMJ-related vessel traffic during operations affecting visual quality, noise, and vessel wake (with an increasing magnitude of effect the closer one is to the vessels); and
- Potential concerns regarding safety of small vessels with large vessels, as assessed in the Accidents and Malfunctions and Effects of the Environment section in Part B of this Report.

Mitigations:

- Proposed mitigations to reduce impacts to Maa-nulth First Nations' right to harvest fish and aquatic plants for domestic purposes include the Marine Communications Plan recommended as KMMs under CEAA 2012; and
- The EAO acknowledges that these mitigation measures would not reduce impacts for baseline conditions and/ or impact of future projects, which are a source of issues for many Indigenous Groups.

[364] as set out in *Ahousaht Indian Band and Nation v. Canada (Attorney General),* 2013 BCCA 300.

B. POTENTIAL IMPACTS ON RIGHT TO HARVEST WILDLIFE AND MIGRATORY BIRDS

The EAO evaluated the potential effects on the right to harvest wildlife and migratory birds attributable to TMJ in Section 13.3.2 above that apply broadly to Indigenous Groups. The EAO is satisfied that the key impacts to biophysical components resulting in changes to wildlife and quality, changes in access to harvesting areas, and changes to social, cultural, and spiritual values associated with traditional harvesting activities that apply to the Maa-nulth First Nations are summarized in Section 13.3.2.

Conclusion

In consideration of the available information in Section 13.3.2, the EAO's consultation with Maa-nulth First Nations, Maa-nulth First Nations' engagement with TJLP, TJLP's commitments, the EAO's proposed EAC conditions if an EAC is issued and the recommended KMMs under CEAA 2012, TMJ is expected to result in **negligible** impact on Maa-nulth First Nations' right to harvest wildlife and migratory birds.

The key factors that were considered in support of the EAO's conclusion on impacts to the right to harvest wildlife and migratory birds included the EAO's conclusions on adverse residual effects to wildlife in the MSA area predict negligible to low magnitude mortality of select marine bird species. The EAO also considered that in the MSA area, operations (30 years in duration) may cause infrequent, short-term, temporary disruptions to marine-based harvesting along the proposed LNG vessel route and negligible effects on Indigenous access to terrestrial harvesting sites that are accessed by boat from the pilot station at Sand Heads to the 12 nm territorial limit. The EAO understands that Maa-nulth First Nations agrees with the EAO's residual effects assessment but are uncertain about the EAO's significance determination for the potential effects to migratory and marine birds from TMJ in Part B of this report.

To mitigate potential impacts to Maa-nulth First Nations right to harvest wildlife and migratory birds, the EAO is recommending a KMM under CEAA 2012 for a Marine Communication Plan, including procedures to inform Indigenous Groups of traffic schedules and for Indigenous Groups to submit any feedback on potential adverse effects on navigation as a result of TMJ. The EAO also considered that the small relative increase due to TMJ-related vessel traffic would have a negligible effect to experiential aspects of wildlife and migratory bird harvesting from changes to visual quality and noise in the MSA and that all TMJ related vessels would adhere to the Marine Regulations and Legislation regulating vessel noise and lighting.

C. POTENTIAL IMPACTS ON RIGHT TO CULTURE AND HERITAGE

Maa-nulth First Nations have the right to practice the Nuu-chah-nulth culture and to use the Nuu-chah-nulth language in a manner consistent with the Treaty. Nuu-chah-nulth culture includes matters relating to Maa-nulth history, feasts, ceremonies, naming of individuals,

symbols, songs, dances, stories and much more. In the "Marine Economic Highway of a Water People" the resources of the sea were identified as building the economic foundation that has sustained generations of Nuu-chah-nulth people. Maa-nulth First Nations identified that Nuu-chah-nulth culture, values, internal organization, and individual places in Nuu-chah-nulth society were based on their relationship with their territorial waters and that this important connection is reflected in Nuu-chah-nulth art, spiritual practices and the communal principles that govern Nuu-chah-nulth lives[349].

Through the RBT2 and TMJ processes, Maa-nulth First Nations expressed the importance of the SRKW to Maa-nulth First Nations. During the RBT2 process Maa-nulth First Nations explained that SRKW are important Maa-nulth cultural elements, including stories, teachings, cosmology and long-standing symbols of family and kinship. The EAO recognizes the cultural significance SRKW hold to Maa-nulth First Nations. Maa-nulth First Nations also raised concerns through review of TMJ about cumulative impacts to the health and balance of the marine environment, including collapsing resident killer whale populations.

Maa-nulth First Nations expressed concerned about the cumulative effects of the marine shipping industry on SRKWs, including that vessel strikes and harm to prey should also be identified as a pathway for residual effects. The EAO understands that Maa-nulth First Nations disagree with the EAO's significance determination for residual effects to SRKWs for TMJ in part B of this report and that Maa-nulth are of the view that any harm to SRKWs due to a major project such as TMJ is significant, given the small and declining population.

The EAO evaluated the potential for TMJ-related residual and cumulative effects to impact other traditional and cultural interests of Indigenous Groups in the MSA, as summarized in Section 13.3.3. In its evaluation, the EAO considered potential marine-shipping related effects pathways to impacts based on review of publicly available information from RBT2 and TMX processes, and any information provided by Indigenous Groups during the MSA review. The EAO is satisfied that TMJ's marine shipping-related effects in the MSA area to access, quality of experience and SRKWs would be the pathways to impacts to Maa-nulth First Nations' other traditional and cultural interests.

- See Section 13.3.3 for a detailed discussion of the analysis and resolution of concerns related to the effects on whales. As discussed in Section 13.3.3, the EAO concluded that TMJ would not result in significant residual effects to Marine Mammals; however, the EAO notes that the current baseline of cumulative effects to SRKWs are already high and that TMJ would contribute additional residual effects from shipping noise and potential avoidance behaviour by SRKWs to ships, such that cumulative effects to SRKWs are considered significant; and

- The EAO is recommending as a KMM under CEAA 2012 a Vessel Traffic Management Plan that would require TJLP to incorporate contractual measures to support participation of TMJ-related vessels in the VFPA-led ECHO Program seasonal slowdown initiatives (or future equivalent), and annual reporting on TJLP's participation in regional environmental management measures and cumulative effects monitoring to protect SRKW, where feasible The seasonal slowdown initiatives currently request vessels to slow down in key SRKW foraging areas such as Swiftsure Banks, Haro Strait and Boundary Pass. The EAO notes several regional initiatives and measures have been implemented by the Government of Canada to better understand and manage cumulative effects on the recovery of SRKWs (listed in Section 13.1.1).

During the MSA review, Maa-nulth First Nations requested more information about the potential for TMJ-related vessels to have the best available technology related to underwater noise and emissions. Maa-nulth also requested more information about requirements for propellor maintenance as that relates to underwater noise, and to better understand all the players involved, including the ship builders, customers, and recipients of LNG, as well as the roles, responsibilities, and oversight that Canada or the province would have, or potential role or commitment of TJLP in overseeing the process of industry standards.

- In response, TJLP provided Maa-nulth First Nations with a diagram outlining the potential contracting relationships related to LNG export proposed by TMJ, which outlined the primary and third-party contracts. The diagram that TJLP provided showed that TMJ would not have a direct contract with the shipper or the shipowner, and TJLP has stated that TMJ's influence on ship building contracts would be limited;
- The EAO is recommending as KMMs under CEAA 2012 for a Vessel Traffic Management Plan that would require TJLP to incorporate contractual measures to support participation of TMJ-related vessels in the VFPA-led ECHO Program seasonal slowdown initiatives (as amended) or a future equivalent, and annual reporting on TJLP's participation in regional environmental management measures and cumulative effects monitoring to protect SRKW, where feasible. The seasonal slowdown initiatives currently request vessels to slow down in key SRKW foraging areas such as Swiftsure Banks, Haro Strait and Boundary Pass;
- The EAO also notes the existing regional Government of Canada initiatives and measures noted in Section 13.1.1 of this document as being key to reducing baseline cumulative effects to SRKWs; and
- The EAO understands that TMJ-related LNG carriers would be purpose built, and marine shipping associated with TMJ would be required to meet the international standards and Canadian regulations set out by Canada's compliance-based marine safety and security system, which is designed to protect life, property, and the marine

environment.

Conclusion

The EAO predicts the TMJ-related marine shipping effects alone would have **negligible-to-minor** impacts on Maa-nulth First Nations' Right to culture and heritage, although the EAO acknowledges that there is uncertainty in the relationship between incremental increases in shipping and the availability of cultural resources, such as SRKW. However, in consideration of the available information, the EAO's consultation with Maa-nulth First Nations, Maa-nulth First Nations' engagement with TJLP, TJLP's commitments and the EAO's proposed EAC conditions if an EAC is issued, and the recommended KMMs under CEAA 2012, the impacts from TMJ combined with cumulative effects in the MSA area is expected to result in moderate-to-serious impacts on Maa-nulth First Nations' Right to culture and heritage.

EAO understands that Maa-nulth First Nations views such cumulative effects to Maa-nulth First Nations culture and heritage as significant, given importance of fish, fishing and SRKW to their culture. The EAO considered Maa-nulth First Nations' perspectives on cumulative effects and Maa-nulth First Nations' ability to meaningfully practice their culture and heritage in the MSA area. The EAO acknowledges that there are already vessels transiting the shipping lanes which can impact Indigenous mariners' access to and quality of experience while on the water and the EAO's conclusions of significant cumulative effects to SRKWs was a key factor considered in the EAO's seriousness determination. The EAO notes several regional initiatives and measures have been implemented by the Government of Canada to better understand and manage cumulative effects on the recovery of SRKWs (listed in Section 13.1.1).

The key factors that were considered in support of the EAO's conclusion on the impacts to other traditional and cultural interests are summarized as follows:

Culture and Heritage Resources:

- The EAO's conclusions in the Heritage Resources section of Part B did not predict residual effects on Heritage Resources (Section 7.1) from erosion due to wake effects along the shorelines of the MSA area;
- The EAO's conclusions in Part B section on Marine Mammals, which found low to moderate magnitude residual effects from TMJ-related vessels on SRKWs and significant cumulative effects to SRKWs due to underwater noise;
- The MSA area is a heavily utilized marine environment; and
- Maa-nulth First Nations identified significant cumulative effects given the state of the marine environment (i.e., declining fish stocks and Southern and Northern Resident Killer Whale populations).

Geospatial:

- Many sites of cultural importance may be present in the MSA area with locations are not publicly known. One known site is the historic village *Kiix?in* located just north of the MSA area;
- The EAO's conclusions in the Current Use section in Part B found that TMJ-related vessel transits would be regular and of relatively short duration passing through areas in the Salish Sea; and
- Maa-nulth First Nations identified significant cumulative effects given the number of vessels already passing through Maa-nulth First Nations' waters and the state of the marine environment.

Social, Cultural, Experiential:

- Potential negligible to low impacts due to incremental increases from TMJ-related vessel traffic during operations affecting visual quality, noise, and vessel wake (with an increasing magnitude of effect the closer one is to the vessels);
- Potential concerns regarding safety of small vessels with large vessels and wake effects, as assessed in the Accidents and Malfunctions and Effects of the Environment section in Part B; and
- Maa-nulth First Nations' cultural and spiritual interest in marine species, including SRKW.

Mitigations:

- Proposed mitigations for potential impacts to traditional and cultural interests are the recommended key mitigations under CEAA 2012 for a Marine Communications, and Vessel Traffic Management Plans, and a Marine Shipping Emergency Response Outreach Program;
- The EAO is recommending as KMMs under CEAA 2012 for a Vessel Traffic Management Plan that would require TJLP to incorporate contractual measures to support participation of TMJ-related vessels in the VFPA-led ECHO Program seasonal slowdown initiatives (as amended) or a future equivalent, and annual reporting on TJLP's participation in regional environmental management measures and cumulative effects monitoring to protect SRKW, where feasible. The seasonal slowdown initiatives currently request vessels to slow down in key SRKW foraging areas such as Swiftsure Banks, Haro Strait and Boundary Pass;
- The EAO acknowledges that these mitigation measures would not reduce impacts for

baseline conditions and/ or impact of future projects, which are a source of issues for many Indigenous Groups.

D. POTENTIAL IMPACTS ON OTHER VALUES

Economic Impacts and Governance

Through letters to, and meetings with, the EAO during the TMJ EA, Maa-nulth First Nations have expressed their concerns about cumulative impacts, and how this might impact their use of the marine environment. Maa-nulth First Nations have noted that the further industrialization of the Salish Sea, the decline of both the fishery and forestry economy on the West Coast of Vancouver Island and the ongoing alienation of resources from our traditional territories without economic benefits to their communities, pose a danger to their way of life and existence as distinct peoples. Through the TMJ EA and the RBT2 process, Maa-nulth First Nations explained that there were already constraints on their commercial fisheries, and any increase in vessels would exacerbate this. While outside their territories, Maa-nulth First Nations also expressed concern about the environmental impacts of fracking as this relates to one of their principles, *hišuk ma c̓awak* (everything is connected). Please see the EAO's response to concerns related to climate change and upstream natural gas activities in Section 13.2.3 of this Report.

As stated in the Maa-nulth Treaty, Canada and BC acknowledge the aspirations of the Maa-nulth First Nations to preserve, promote and develop the culture, heritage, language and economies of the Maa-nulth First Nations and the aspirations of the Maa-nulth First Nations and the Maa-nulth-aht to participate more fully in the economic, political, cultural and social life of British Columbia in a way that preserves and enhances the collective identity of the Maa-nulth-aht as the Maa-nulth First Nations and to evolve and flourish as self-sufficient and sustainable communities. The RBT2 Panel Report (2020) noted that Maa-Nulth First Nations' business and economic development potential relied on the marine environment and Maa-nulth First Nations considers that intrusions on Maa-nulth First Nations' traditional territories are intrusions on their ability to use, enjoy and profit from those territories. In addition to fishing for FSC purposes, Maa-nulth First Nations also engage in commercial and recreational fishing industries, seafood processing, numerous shellfish aquacultures, growing oysters, seaweed, kelp and different shellfish, marinas, and ecotourism. Through the MSA for TMJ, Maa-nulth First Nations identified that access to adequate, long-term, stable funding is needed to restore the Maa-nulth First Nations' rightful place as stewards within their Territories.

In Part B, Land and Marine Resource Use (Section 8.2) and Current Use of Lands and Resources for Traditional Purposes (Section 11.4), the EAO concludes that TMJ-related vessel movements would result in negligible to low impacts to commercial fishing, including commercial harvesting

areas in Maa-nulth First Nations' Southern Domestic Fishing Area that overlap the shipping lanes (i.e., Swiftsure Bank). The EAO also predicted that residual effects to the experience of commercial and non-commercial marine users conducting their activities are expected to diminish with increased distance from TMJ vessels in transit and are predicted to be negligible in magnitude. Maa-nulth First Nations told the EAO that the Maa-nulth Treaty provides a right to convert commercial fishing licences to constitutionally protected rights. The EAO understands that Maa-nulth First Nations view the cumulative effects from TMJ to their treaty fishing and trade and bartering rights as significant, given the volume of existing and proposed future vessel traffic through the Maa-nulth Domestic Fishing Area. Due to use of TMJ-related operations requiring use of Maa-nulth First Nations' territories for marine shipping, and necessary to advance reconciliation, the principles of the UN Declaration on the Rights of Indigenous Peoples and the Truth and Reconciliation Commission's Call to Action, Maa-nulth First Nations stated that they should share in the economic benefits of commercial use of their territory. In response to this request, the EAO clarified that the role of the EAO is to neutrally lead EAs and that it is not within the EAO's mandate to create frameworks or policies for economic benefit sharing. However, the EAO shared Maa-nulth First Nations' interest in this matter with MIRR and provided treaty relations staff contact information so that Maa-nulth First Nations could discuss the matter further with MIRR. The EAO understands that dialogue regarding this matter is ongoing between Maa-nulth Treaty Society, Maa-nulth First Nations governments and the federal and provincial governments.

During the EA for TMJ, Maa-nulth First Nations requested to be consulted on draft provincial conditions and to be included within the definition of Indigenous Groups with respect to the provincial TOC. The EAO considers, that where federal conditions capture key mitigations for potential TMJ-related effects to fish and fish habitat and shipping-related effects within the broader MSA area, provincial conditions are more focused on project activities within the marine terminal area (i.e., the jetty site). For these reasons, the EAO would not require that that TJLP consult with Maa-nulth on development of management plans pursuant to provincial conditions. The EAO notes that where monitoring or reporting would be required for provincial conditions, these documents would be posted to the EAO's public website. The EAO is recommending as KMMs under CEAA 2012 for a Vessel Traffic Management Plan, Marine Communications Plan, and Marine Shipping Emergency Response Outreach Program for potential shipping-related effects. The EAO is also recommending that Maa-nulth First Nations be consulted in the development of these plans / mitigations, which will inform the Agency's development of federal conditions for TMJ.

Accidents and Malfunctions

Maa-nulth First Nations also raised concerns regarding potential impacts of an accident or malfunction involving a TMJ-related LNG carrier and a bunker fuel spill on the environment and traditional resources at different locations in the shipping lanes and across seasons. The EAO has noted Maa-nulth First Nations concerns through the RBT2 process with respect to accidents and malfunctions in their territories and the potential implications this might have for current and future governance and stewardship. During the MSA review for TMJ, Maa-nulth First Nations posed questions about specific-activities and agency roles and responsibilities related to marine shipping emergency preparedness and response processes. In response, TJLP and Canada Coast Guard (CCG) provided additional information regarding the roles of VFPA, CCG, TC, Western Canada Marine Response Corporation (WCMRC) and local authorities in emergency response and preparedness regarding shipping-related accidents and malfunctions. The EAO also understands that provincial ministries, health authorities, and local and Indigenous governments would work closely with these federal agencies to coordinate spill response activities.

Maa-nulth First Nations also requested further dialogue and information regarding LNG carrier route jurisdiction and whether Canada had jurisdiction to establish mandatory shipping lanes beyond 12 nm. In response, Maa-nulth First Nations was provided with additional information from TC regarding the current feasibility study that is exploring options to assessment potential amendments to the Traffic Separation Scheme (TSS) /structural routing measures within SRKWs critical habitat; however, TC was not making regulatory or strategic decisions about amendments to the TSS or as a part of this study. While TC may be relying on the study to inform future decisions, such decisions would be subject to further consultations to avoid, mitigate or accommodate impacts to rights and TC is committed to engaging with Indigenous communities to ensure impacts and benefits of potential feasibility options are considered.

With respect to accidents and malfunctions, Maa-nulth First Nations also raised concerns related to the adequacy of the assessment methods used to determine potential impacts due to bunker oil spill, including the volume of bunker fuel and single location and season used in the modelling. Maa-nulth also requested more information related to the facilitate the integration of plans for responding to incidents in transit into existing emergency response systems, primarily the CCG's Incident Integrated Response Plans regime in the event of a spill involving bunker fuel. In response TJLP noted that a conservative volume was used for modelling of results of a bunker fuel spill. The assessment considered baseline information for the entire MSA area, as well as seasonal variation. TJLP also provided further information regarding the existing environmental enforcement regimes that govern the shipping activities in the MSA. TC confirmed that in Canada, shipowners can be held liable for the cost of prevention

and response measures taken with respect to spills under Section 77I of the *Marine Liability Act*.

TJLP noted that, specific to oil pollution, polluters are financially responsible, even if an incident is accidental. Shipowners are liable (responsible), up to a limit based on the size of their ship, for eligible claims of loss or damage, whether the pollution was caused by oil carried as cargo or used in the operation of the ship[365]. Shipowners are required to have insurance for all of their vessels that are 1,000 gross tonnes or larger in case of oil pollution damage caused by the oil they use as fuel or in the operations of the vessel. Tanker owners are required to have insurance if they carry 2,000 tonnes or more of persistent oil as cargo. If the costs of a persistent oil spill caused by an oil tanker were more than the tanker owner's limit of liability, additional compensation could be paid by international funds financed by industry and distributed by the International Oil Pollution Compensation Funds (IOPC Funds). The Ship-Source Oil Pollution Fund (SOPF) under the *Marine Liability Act* compensates for damages exceeding shipowner's liability and there is no limit to the amount of compensation available from the SOPF for eligible claims[365]. The EAO is recommending a Marine Shipping Emergency Response Outreach Program as a KMM under CEAA 2012 to facilitate the integration of plans for responding to incidents in transit into existing emergency response systems, primarily the CCG's Incident Integrated Response Plans. Further information regarding the potential impact of a bunker spill, as well as other impacts of TMJ-related vessels, is provided in the Accidents and Malfunctions and Effects of Environment on the Project Section of this Report (Section 9).

In consideration of the available information, the EAO's consultation with Maa-nulth First Nations, Maa-nulth First Nations' engagement with TJLP, TJLP's commitments, the EAO's proposed EAC conditions if an EAC is issued and the recommended KMMs under CEAA 2012, the EAO is of the view that the concerns raised regarding potential TMJ-related impacts on Maa-nulth First Nations' other values have been adequately considered and addressed at this stage of review.

[365] Eligible claims include: pollution prevention measures; clean-up costs; property damage; fisheries losses; subsistence losses; tourism losses; and environmental remediation. For more information on compensation visit: https://tc.canada.ca/en/marine-transportation/marine-safety/marine-liability-compensation-oil-spills

16.2 PACHEEDAHT FIRST NATION

16.2.1 COMMUNITY PROFILE

Pacheedaht (meaning "Children of the Sea Foam") Territory is located on the southwest coast of Vancouver Island, bounded on the east near Point No Point and Sheringham Point and on the west near Cullite Creek and Bonilla Point, and extending inland to include the drainages of the rivers and streams on Vancouver Island between the two locations. Pacheedaht First Nation reported that they have continuously occupied their territory for at least the past several centuries with their livelihood, culture, and spirituality based primarily on the marine environment. The pre-contact population of Pacheedaht First Nation was approximately 1,500 people, with villages and camps spread along shorelines and rivers. As of November 2021, Pacheedaht First Nation now has a registered population of 289 people, 95 of those living on reserve[366]. The MSA noted that there are historic and current permanent and temporary Pacheedaht First Nation residences up the San Juan River, in Port San Juan and along the outer coast of Pacheedaht territory.

All coastal areas are of concern to Pacheedaht First Nation, as the contiguous shoreline is interrelated with the Strait of Juan de Fuca. Pacheedaht First Nation traded marine resources with other Nations and white explorers and traders. Pacheedaht First Nation practiced whaling and sea otter and commercial fur seal hunting beginning in the 1870s. Traditional seasonal movements (seasonal tasks) of Pacheedaht First Nation were determined by the availability and abundance of marine resources, particularly fish, and specifically salmon. The EAO understands that Pacheedaht First Nation consider that the central importance of control over, use and access of Pacheedaht First Nation's marine territory, and in particular *ƛučii?aa?aq* (Swiftsure Bank), is illustrated by the location of historical Pacheedaht villages and campsites. For example, the large permanent Pacheedaht historic village of *Qala:yit* (current location of Cullite IR3 that is east of Bonilla Point) provided Pacheedaht First Nation with excellent access to

[366] Indigenous and Northern Affairs Canada. 2021. First Nation Profiles – Pacheedaht First Nation. https://fnp-ppn.aadnc-aandc.gc.ca/fnp/Main/Search/FNRegPopulation.aspx?BAND_NUMBER=658&lang=eng, accessed December 16, 2021.

ƛučii?aa?aq (Swiftsure Bank), and other prime fishing and marine mammal hunting grounds, and seafood gathering sites[367].

Pacheedaht First Nation asserts Aboriginal title to its traditional territory and rights to self-governance, fish, hunt, trap, gather, and perform other cultural practices. Pacheedaht First Nation fish vast quantities for FSC purposes. A large portion of the Pacheedaht First Nation diet is comprised of traditional foods, whereas other First Nations must supplement their harvesting activities with intertribal trade to maintain traditional diets. Pacheedaht First Nation fish throughout the offshore portion of Pacheedaht First Nation's territory.

Impacts to whales, their migration or feeding patterns threaten Pacheedaht First Nation's rights to engage in spiritual belief systems. The Makah Tribe (in Washington State) reasserted its right to hunt whales in the late 1990s, Pacheedaht First Nation may follow suit. Traditional whale meat improves First Nations' health and whaling rituals could reinvigorate spiritual connections. Pacheedaht First Nation has the right and responsibility to preserve such resources for youth and future generations. Service-based businesses (e.g., restaurants, hotels, and whale watching, hiking, and canoe tours) rely on shoreline areas of Pacheedaht First Nation's territory. Intact natural beauty, water and air quality, soundscape, biodiversity, and safety are required for Pacheedaht First Nation to take advantage of tourism opportunities.

Pacheedaht First Nation is currently in the BC Treaty negotiation process (negotiating at a common table with Ditidaht). Of the six-stage process, Pacheedaht First Nation is in stage 5 (Negotiation of an Agreement-in-Principle) of the BC Treaty process.

The MSA for TMJ stated that Pacheedaht First Nation rely heavily on marine resources and the marine environment and they continue to harvest extensively for FSC purposes, with Swiftsure Bank as a prime harvesting location. Pacheedaht First Nation identify Swiftsure Bank as its main source of their traditional wealth, that the area was traditionally under mutual control with neighbouring Ditidaht and Makah, and that harvesting at Swiftsure provided a variety of resources important for not only subsistence, but also as trade goods and wealth of Pacheedaht citizens. The EAO is aware that traditional trade routes extended in four directions from Pacheedaht First Nation Territory, and that some of the traditional products Pacheedaht First Nation supplied for trade were produced from resources harvested from Swiftsure Bank, especially halibut, whale, fur seal, dogfish, salmon, and groundfish. It is noted that the

[367] Pacheedaht Heritage Project, Pacheedaht First Nation Treaty Department, and Traditions Consulting Services, Inc. 2019 Updated – Pacheedaht RBT2 Traditional Use and Occupancy Study. https://iaac-aeic.gc.ca/050/documents/p80054/132555E.pdf. Accessed June 21, 2022.

resources harvested at Swiftsure Bank are preferred by Pacheedaht citizens and are perceived to be healthier and more abundant and thus remain significant to Pacheedaht First Nation.

Pacheedaht First Nation has reported that the re-routing of the international shipping lanes in 2005 to intersect Swiftsure Bank has caused significant interference with Pacheedaht First Nation's ability to conduct marine harvesting at Swiftsure bank and that marine traffic presents risks to fishers from vessel wakes and the threat of collision. Pacheedaht First Nation has informed the EAO that from their vantage any increase to levels of large marine vessel traffic within their territory would have significant adverse effects on community members and that the level of risk to Pacheedaht First Nation harvesters has already surpassed a critical threshold, resulting is loss of opportunity to harvest in preferred locations at preferred times. They have also noted that the frequency of existing vessel traffic is at such a level as to make it very difficult for Pacheedaht First Nation fishers to schedule fishing to avoid large vessels, even if schedules are known ahead of time.

16.2.2 PACHEEDAHT FIRST NATION INVOLVEMENT IN THE CONSULTATION PROCESS

Consultation with Indigenous groups identified in Schedule D began in July of 2019 when EAO sent a letter to these groups, inviting comments on the draft Section 13 Order, including consultation processes and opportunities. On August 6, 2019, at the request of Canada, the EAO amended the geographic scope for the assessment of the marine shipping route under a Section 13 Order and added the Indigenous groups identified in Schedule D which included Pacheedaht First Nation. For the review of the MSA, the EAO led consultation activities with the Indigenous Groups identified in Schedule D and, as part of this work, invited Pacheedaht First Nation to participate in the Marine Shipping Working Group.

As part of the Marine Shipping Working Group, the EAO invited Pacheedaht First Nation to review and provide comments on TJLP's MSA Supplemental Analysis, the EAO's draft Assessment Report (including Part C of the Assessment Report), the draft CPD, draft provincial Certificate Conditions and the draft KMMs recommended under CEAA 2012. The EAO consulted Pacheedaht First Nation and sought to resolve concerns raised by Pacheedaht First Nation during the EA for TMJ. To this end, the EAO revised its draft referral materials to include additional information related to Pacheedaht First Nation's perspectives on the EA consultation process and key concerns raised by Pacheedaht First Nation regarding cumulative effects from marine shipping in the Salish Sea, impacts to SRKWs and TMJ-related impacts to Pacheedaht First Nation's Aboriginal Interests.

As part of the Marine Shipping Working Group, Pacheedaht First Nation was invited to participate in working group meetings and teleconferences during the MSA supplemental

analysis review stages. During the EA, the EAO offered to meet directly with Pacheedaht First Nation to discuss TMJ, EA process, the draft assessment on impacts to rights, draft provincial Certificate Conditions and draft KMMs recommended under CEAA 2012 and any potential concerns with TMJ. The EAO is of the view that it has approached consultation with Pacheedaht First Nation at the deeper end of the spectrum, with the intent to identify potential impacts and consider ways to address any potential impacts to Aboriginal Interests that were identified by Pacheedaht First Nation within the MSA area.

Pacheedaht First Nation considered that the consultation opportunities offered to the Schedule D Indigenous groups were limited for the EA of TMJ, and while Pacheedaht First Nation has participated in the EAO's assessment of TMJ through opportunity to review and comment on the MSA and draft assessment report, Pacheedaht First Nation does not view this process as consultation because it did not permit for open dialogues and exchanges required to meet Pacheedaht First Nation's view of meaningful consultation with the Crown. The EAO is of the view it has been responsive to Pacheedaht First Nation's concerns regarding consultation and potential impacts of TMJ and has provided opportunities for dialogue and exchange during the MSA review for TMJ. The EAO is also aware that TJLP has invited Pacheedaht First Nation to engage in the development of a Marine Communications Protocol for TMJ, and that Pacheedaht First Nation and TJLP met on March 25, 2022 to discuss the Bunkering Vessel Scenario Assessment.

Pacheedaht First Nation also expressed concerns that the EAO has limited ability to address many measures suggested by Pacheedaht First Nation that would avoid or mitigate TMJ-related impacts to their Aboriginal Interests. Pacheedaht First Nation suggested altering the behaviour of shipping traffic, improving the capabilities of Pacheedaht fishers, and Improving emergency response capability in Pacheedaht Territory as potential mitigation measures to reduce potential impacts from TMJ. To this end, Pacheedaht First Nation requested meetings with representatives from relevant departments of the Crown, including TC, DFO, the CCG and the BC ENV in their June 19, 2020 letter to the EAO and Agency. In response to Pacheedaht First Nation's request the EAO facilitated a meeting on July 6, 2021 with Pacheedaht First Nation and representatives from the TC and the Canadian Coast Guard to discuss the issues and concerns raised by Pacheedaht First Nation regarding potential TMJ-related impacts on Pacheedaht First Nation's Aboriginal Interests, proposed mitigation of TMJ-related shipping traffic, governance of Pacheedaht marine territory and protecting SRKWs. The EAO understands that Pacheedaht First Nation is also engaging these federal agencies through the RBT2 process and these such conversations pertain to broader, non-EA level regional marine-shipping issues.

After the meeting, Pacheedaht First Nation provided copies of the confidential information that was presented and prepared by Pacheedaht in relation to its Aboriginal rights and title in the marine territory including in relation to SRKW. Pacheedaht First Nation provided this

information in confidence to the EAO and IAAC to assist with the assessment of impacts from TMJ. In response, the EAO made updates to Part C of the Assessment Report (this Report) and shared the changes in draft to Pacheedaht First Nation to confirm the information and Pacheedaht First Nation's perspectives and views had been accurately reflected in the updated referral materials to be provided to provincial and federal Ministers for decision at the end of Application Review.

The EAO understands there are opportunities for Pacheedaht First Nation to participate in the Whales Initiative's TSS Feasibility Study, SRKW recovery measures, CEMS and QVI. For some initiatives funding is available through OPP's CPFP. Pacheedaht First Nation is also eligible for the MSET initiative, the Indigenous and Multi-Stakeholder Advisory Group and Technical Working Groups for the Salish Sea Initiative. As detailed in Section 13.1.1 above, MSET provides funding to eligible Indigenous communities for equipment to enhance the safety of certain Indigenous vessels and for training to build understanding around safety on the water. Pacheedaht First Nations identified that existing regional initiatives are not intended and do not accommodate the concerns of Pacheedaht First Nation in relation to TMJ.

The EAO also understands that TC has been working closely with Pacheedaht First Nation as an OPP Enhanced Maritime Situational Awareness (EMSA) initiative pilot host community to support local and collaborative planning, analysis and decision making. EMSA helps coastal Indigenous communities better plan vessel routes, identify sensitive areas, enhance local marine safety, and protect the environment. CCG is also continuing engagement with Pacheedaht First Nation through the Port Renfrew Multi-Purpose Marine Response Facility Project under the TMX initiative Co-Developing Community Response (CDCR). The EAO notes that these programs are broad in nature and are not intended to mitigate or accommodate for the specific potential impacts to Indigenous mariners and fishers navigating in proximity to TMJ vessels within the Traffic Separation Schemes.

On September 3, 2021, Pacheedaht First Nation provided the EAO with a separate submission but then later advised the EAO not to include it in the referral package for TMJ. On July 26, 2022, Pacheedaht First Nation sent a letter addressed to Executive Project Director at the EAO, and Project Manager at CEAA, advising that, based on commitments made by TJLP, Pacheedaht First Nation consents to the granting of any authorizations or permits necessary for TMJ. Based on the letter, the EAO understands that Pacheedaht First Nation consider consultation for TMJ has been fulfilled, and that Pacheedaht First Nation will continue to participate in the EA and other regulatory processes in a manner that is consistent with its consent for TMJ and does not take the position that the Crown's duty to consult and accommodate has not been met. Pacheedaht First Nation will also continue discussions with the Crown about the cumulative impacts of increased vessel traffic generally in the Strait of Juan de Fuca including in relation to the location of marine shipping lanes, marine safety, and emergency response. The EAO

included Pacheedaht First Nation's letter of consent in the referral package for decision makers at time of referral.

16.2.3 POTENTIAL IMPACTS TO ABORIGINAL RIGHTS AND INTERESTS

The following sections focus on potential impacts of TMJ to Pacheedaht First Nation's Aboriginal Interests, and mitigations and accommodations to address potential impacts. Information related to the EAO's impact assessment methods is provided in Section 12.2 of this Report. The EAO considered information available, including from public sources as well as relevant issues raised by the Pacheedaht First Nation during the EA process (in meetings, letters and Working Group comments), in the following assessments of the potential impacts of TMJ on Pacheedaht First Nation's Aboriginal Interests.

A. POTENTIAL IMPACTS ON FISHING

The EAO evaluated the potential effects of TMJ on Aboriginal fishing rights and provided a summary of this information in Section 13.3.1. In addition to any information provided through the TMJ MSA process, the EAO also considered relevant information related to potential shipping-related effects based on review of RBT2 and TMX processes. The EAO is satisfied that the key impacts to biophysical components resulting in changes to fish quantity and quality, changes in access to fishing resources, and changes to social, cultural, and spiritual values associate with traditional fishing activities that apply to Pacheedaht First Nation are summarized in Section 13.3.1.

The MSA reported on Pacheedaht First Nation's traditional use and occupancy study prepared for the RBT2 process[367]. It noted that Pacheedaht First Nation identified 270 fishing sites distributed throughout the study area, including all areas of Port San Juan, up the San Juan River and Gordon River, as well as both inshore and offshore along the outer coast. The same study identified 119 seafood gathering sites in Port San Juan and along the outer coast. As noted above, Swiftsure Bank is a key and preferred fishing area for Pacheedaht First Nation and would require them to enter the shipping lanes to access some areas of Swiftsure Bank.

During the MSA for TMJ, Pacheedaht First Nation raised concerns regarding the potential for marine shipping impacts to Pacheedaht First Nation's fishing rights, including the potential for serious cumulative effects on access to and quality of experience of fishing and safety for Pacheedaht harvesters, especially at Pacheedaht First Nation's preferred fishing locations at Swiftsure Bank. The MSA area, including Swiftsure Bank, is a heavily utilized marine environment with occasionally high levels of marine traffic in the shipping lanes and Pacheedaht First Nation stated that the frequency of existing vessel traffic at Swiftsure is so

high as to make it "practically impossible" for Pacheedaht fishers to schedule fishing activities to avoid vessels even if this schedule were known to Pacheedaht fishers.

Pacheedaht First Nation is of the perspective that effects of any increase to levels of large marine vessel traffic within Pacheedaht territory would have significant adverse effects on Pacheedaht people and that the level of risk to Pacheedaht First Nation harvesters has already surpassed a critical threshold, resulting is loss of opportunity to harvest in preferred locations at preferred times and that the LNG-laden vessels associated with TMJ would heighten these existing risks significantly. Pacheedaht First Nation is also of the perspective that the MSA underestimated the risk of wakes from large vessels on Pacheedaht First Nation marine harvesters due to insufficient modelling in three specific zones, including Swiftsure Bank, and identified a concern that the EAO relied on the Collision Regulation in its conclusion on potential impacts from TMJ-related vessels to Indigenous fisheries access to harvesting areas at Swiftsure bank or when crossing shipping lanes.

- The EAO respectfully acknowledges Pacheedaht First Nation's worldview and perspective that there are currently existing cumulative effects which have already affected Pacheedaht First Nation's ability to exercise their fishing rights as preferred within Pacheedaht First Nation's asserted traditional territory. As described in the Current Use assessment in Part B, the EAO concluded that TMJ would have the potential to contribute significant cumulative effects (that already occur at baseline) to access to and the experience of current use for fishing for Pacheedaht First Nation at Swiftsure Bank. The EAO predicts TMJ shipping activities could result in infrequent and short-duration interruptions to Pacheedaht First Nation's access and experience of current use for fishing occurring regularly during operations (30 years minimum);
- The EAO agrees with TJLP's assessment that TMJ-related vessel wakes are predicted to be within the natural variation of wave heights in the Salish Sea and that TMJ-related vessel movements would represent a less than 2 percent increase in vessel traffic within the Swiftsure Bank fishing area, with anticipated interactions with Pacheedaht First Nation fishers to be intermittent and of short duration. The EAO acknowledges that wakes generated by TMJ vessels would be larger the closer one is to the vessel and that the presence of LNG carriers may be considered disturbing for safety or other reasons by Indigenous people, which could lead to reduced opportunities to practice Aboriginal rights in and around the shipping lanes;
- The EAO considers that the safety of small vessels with large vessels and wake effects were assessed in the Accidents and Malfunctions and Effects of the Environment Sections of Part B and that the regular and relatively short-duration passage of TMJ-related vessel through the Salish Sea would include monitoring of compliance with

maritime regulations and legislation such as the *Canada Shipping Act* and the Collision Regulations;

- The EAO is proposing a KMM under CEAA 2012 for TMJ to have a Marine Communication Plan for TMJ (from the site out to 12 nm), including procedures to inform Indigenous Groups of traffic schedules, for Indigenous Groups to submit any feedback on potential adverse effects on navigation as a result of TMJ, and for TJLP to document and respond to any feedback received in a timely manner. Pacheedaht First Nation informed the EAO that this type of mitigation would not be effective for mitigating the impacts of marine shipping at Swiftsure Bank due to the high volume of shipping traffic already occurring there;
- TJLP has stated that TMJ's influence on TMJ-related vessel operations would be limited beyond TMJ's marine terminal area (including the location and operation of international shipping lanes), but TJLP has committed to a Marine Communication Plan out to 12 nm that would be developed in consultation with Schedule B and D Indigenous Groups and include a communication procedure to inform Indigenous Groups of vessel schedules and provide a complaint submission process;
- Due to the nature of Pacheedaht First Nation's concerns about cumulative effects, the EAO acknowledges that the TMJ-specific mitigations would not reduce impacts for baseline conditions and / or impact of future projects, which are a source of issues for many Indigenous Groups. The EAO also considers that the TMJ-specific mitigation measures would not reduce impacts to quality of experience because some Indigenous people may find the presence and sounds of LNG carriers disturbing for safety and/or aesthetic reasons, or for other reasons. The EAO acknowledges that shipping-related access interruptions and concerns about safety could then lead to reduced opportunities for cultural transmission, including Indigenous language acquisition by younger generations while undertaking traditional harvesting activities on land or on the water, and in particular, while fishing; and
- The EAO notes that existing regional Government of Canada initiatives associated with the OPP (i.e., CEMS, EMSA and CPFP) and accommodations originating from TMX (i.e., CDCR, SSI and MSET) are designed to improve Indigenous communities participation in marine safety systems in Canada and may collectively reduce effects within the region. Although these initiatives are not TMJ-specific, the EAO recognizes that these programs are working towards a better understanding of cumulative effects in the Salish Sea and illustrate the efforts that are being undertaken by the Crown in relation to past and future impacts that contribute to the "current state".

Pacheedaht First Nation also raised concern regarding lack of information regarding monitoring and follow-up programs related to effects of marine shipping on Pacheedaht First Nation marine harvesting as well as concern regarding difficulty for Pacheedaht First Nation fishers due to lack of technology to predict the location and course of shipping traffic and respond to traffic in a timely way.

- The EAO has recommended a KMM under CEAA 2012 for a Marine Communication Plan that would require TJLP to notify Indigenous Groups of project activities in advance of ship movements to reduce potential interactions with other vessels and crafts in the area and develop procedures for Indigenous Groups to provide feedback on adverse effects related to navigation, including requirement for TJLP to document and respond to feedback in a timely manner; and
- The EAO is aware that TC has been working closely with Pacheedaht First Nation as an OPP EMSA initiative pilot host community to support local and collaborative planning, analysis and decision making. The EAO also understands that CCG is also continuing engagement with Pacheedaht First Nation through the Port Renfrew Multi-Purpose Marine Response Facility Project under the TMX CDCR. The EAO is also aware of the MSET initiative, which provides funding to eligible Indigenous communities for equipment to enhance the safety of certain Indigenous vessels and for training to build understanding around safety on the water. The EAO notes that these programs are broad in nature and are not intended to mitigate or accommodate for the specific potential impacts to Indigenous mariners and fishers navigating in proximity to TMJ vessels within the established Traffic Separation Schemes.

Conclusion

The EAO predicts that TMJ-related marine shipping effects would have a **negligible-to-minor** impact on Pacheedaht First Nation's right to fish. The EAO considers TMJ-related increases to vessel traffic during operations would be incremental compared to existing baseline conditions of the established Traffic Separation Scheme of the Salish Sea. However, in consideration of the available information, the EAO's consultation with Pacheedaht First Nation, TJLP's engagement with Pacheedaht First Nation, TJLP's commitments, the EAO's proposed EAC conditions if an EAC is issued, and the recommended KMMs under CEAA 2012, the EAO concludes that TMJ-related marine shipping effects combined with cumulative effects in the MSA area is expected to result in a **moderate-to-serious** impact on Pacheedaht First Nation's right to fish. The EAO predicts that TMJ-related shipping activities during operations would interact with current baseline levels of cumulative effects to access to fishing areas and the experience of fishing in, or adjacent to, the shipping lanes. These cumulative effects in the MSA area combined with the importance of Swiftsure Bank as the key fishing area for Pacheedaht First Nation and the

location of the shipping lanes overlapping this area increase the seriousness of impact of TMJ on Pacheedaht's First Nation's right to fish.

The EAO considered Pacheedaht First Nation's perspectives on cumulative effects and Pacheedaht First Nation's ability to meaningfully practice their fishing rights in the MSA area. The EAO acknowledges that there are already vessels transiting the shipping lanes which can impact Indigenous fishers' access to and quality of experience of fishing. The EAO understands that shipping-related access interruptions and concerns about safety currently contribute to reduced opportunities for cultural transmission, including Indigenous language acquisition by younger generations while undertaking traditional harvesting activities including fishing. While the EAO recognizes there is some uncertainty when considering how cumulative effects impact Aboriginal Interests, the EAO agrees with Pacheedaht First Nation, that any increase in vessel traffic at Swiftsure Bank would potentially be more serious when combined with past, present and reasonably foreseeable shipping activities.

The EAO understands there are opportunities for Pacheedaht First Nation's participation in the Whales Initiative's TSS Feasibility Study, CEMS, MSET, or the Indigenous and Multi-Stakeholder Advisory Group and Technical Working Groups for the Salish Sea Initiative. For some initiatives funding is available through the OPP's CPFP. The EAO also understands that TC has been working closely with Pacheedaht First Nation as an OPP EMSA initiative pilot host community to support local and collaborative planning, analysis and decision making. EMSA helps coastal Indigenous communities better plan vessel routes, identify sensitive areas, enhance local marine safety, and protect the environment. CCG is also continuing engagement with Pacheedaht First Nation through the Port Renfrew Multi-Purpose Marine Response Facility Project under the TMX initiative CDCR. The EAO notes that these programs are broad in nature and are not intended to mitigate or accommodate for the specific potential impacts to Indigenous mariners and fishers navigating in proximity to TMJ vessels within the established Traffic Separation Scheme in the Salish Sea.

The key factors that were considered in support of the EAO's conclusion on the impacts to the right to fish are summarized as follows:

Biophysical:

- The EAO's conclusions in the Fish and Fish Habitat chapter in Part B which does not predict any residual effects to fish and fish habitat in the MSA area; and
- The MSA area, including Swiftsure bank, is a heavily utilized marine environment with occasionally high levels of marine traffic in the shipping lanes.

Geospatial:

- Swiftsure bank is intersected by shipping lanes, where cumulative effects from shipping traffic is a constraint on Pacheedaht First Nation's ability to exercise their fishing rights, including both direct and indirect impacts to access, safety, and quality of experience;
- While Pacheedaht First Nation has identified other fishing sites that do not require crossing the shipping lanes to access, Swiftsure Bank is a prime resource harvesting location and important site for knowledge transfer for Pacheedaht First Nation;
- The EAO's conclusions in the Current Use chapter of Part B that TMJ would result in an incremental increase (i.e., 0.2 – 1.1 % for segments A – D) in vessel traffic when compared to baseline conditions in the Traffic Separation Scheme and that TMJ-related vessel transits during operations (minimum 30 years) would result in negligible to low magnitude effects due to relatively infrequent and short-duration disruptions to access to fishing areas in the Salish Sea; and
- The predicted overlap of TMJ-related shipping activities with cumulative effects from current and reasonably foreseeable shipping activities that would further constrain Pacheedaht First Nation's ability to exercise their fishing rights, such that impacts may be compounded at Swiftsure Bank.

Social, Cultural and Experiential:

- Potential negligible to low impacts due to incremental increases from TMJ-related vessel traffic during operations affecting visual quality, noise, and vessel wake (with an increasing magnitude of effect the closer one is to the vessels);
- The predicted overlap of TMJ-related shipping activities with cumulative effects from current and reasonably foreseeable shipping activities that would further constrain Pacheedaht First Nation's ability to exercise other cultural, social and experiential components of their fishing rights, including intergenerational knowledge transfer, such that impacts may be compounded at Swiftsure Bank;
- Pacheedaht First Nation consider Swiftsure Bank was its primary traditional harvesting site for some resources supplied for trade (e.g., whale, halibut, fur seal, salmon, and groundfish), and was important not only to the subsistence but trade and wealth of Pacheedaht citizens; and
- Pacheedaht First Nation stated that the degree of vessel traffic at Swiftsure has already surpassed a critical threshold in terms of safety risk and impacts on the experience of fishing, resulting in a loss of opportunity to harvest in preferred locations at preferred times.

Mitigations:

- Proposed mitigations for impacts to Pacheedaht First Nation's right to fish include the Marine Communications Plan recommended as KMMs under CEAA 2012; and
- While the EAO is of the view that the potential impacts on Pacheedaht First Nation's fishing rights have been avoided, minimized, and accommodated to the extent possible for the purposes of the EA, the EAO also recognizes that there are outstanding impacts, in particular regarding cumulative effects, and these outstanding impacts are reflected in the EAO's conclusions in Part B and Part C for TMJ.

B. POTENTIAL IMPACTS ON HUNTING, TRAPPING AND GATHERING

The EAO evaluated the potential effects on hunting, trapping and gathering activities attributable to TMJ in Section 13.3.2 above that apply broadly to Indigenous groups. The EAO is satisfied that the key impacts to biophysical components resulting in changes to wildlife and vegetation quantity and quality, changes in access to hunting, trapping and gathering areas, and changes to social, cultural, and spiritual values associated with traditional hunting, trapping and gathering activities that apply to Pacheedaht First Nation are summarized in Section 13.3.2.

The MSA noted that Pacheedaht First Nation harvested a variety of marine birds, including ducks such as mallard, surf scoter, common merganser, bufflehead, and common goldeneye, brant and swans. Ducks and other intertidal birds are hunted on beaches, rocky shorelines, marshes, river estuaries, tidal zones, and tidal flats and are an important winter food source.

Conclusion

In consideration of the available information in Section 13.3.2, which outlines the potential effect to hunting, trapping and gathering; consultation with Pacheedaht First Nation; TJLP's engagement with Pacheedaht First Nation; TJLP's commitments; the EAO's proposed EAC conditions if an EAC is issued and the recommended KMMs under CEAA 2012, TMJ is expected to result in **negligible** impact on Pacheedaht First Nation's right to hunt, trap and gather.

The key factors that were considered in support of EAO's conclusion on the impacts to the right to hunt, trap and gather included the EAO's conclusions on adverse residual effects to wildlife in the MSA area predict negligible to low magnitude mortality of select marine bird species. The EAO also considered that in the MSA area, operations (30 years in duration) may cause infrequent, short-term, temporary disruptions to marine-based hunting along the proposed LNG vessel route and negligible effects on Indigenous access to terrestrially based hunting, trapping, and gathering sites that are accessed by boat from the pilot station at Sand Heads to the 12 nm territorial limit. To mitigate potential impacts to Pacheedaht First Nation's right to hunt, trap and gather, the EAO is recommending a KMM under CEAA 2012 for a Marine

Communication Plan, including procedures to inform Indigenous Groups of traffic schedules and for Indigenous Groups to submit any feedback on potential adverse effects on navigation as a result of TMJ. The EAO also considered that the small relative increase due to TMJ-related vessel traffic would have a negligible effect to experiential aspects of hunting, trapping, and gathering from changes to visual quality and noise in the MSA and that all TMJ related vessels would adhere to the Marine Regulations and Legislation regulating vessel noise and lighting.

C. POTENTIAL IMPACTS ON OTHER TRADITIONAL AND CULTURAL INTERESTS

The EAO evaluated the potential for TMJ-related residual and cumulative effects to impact other traditional and cultural interests of Indigenous Groups in the MSA, as summarized in Section 13.3.3. In its evaluation, the EAO considered potential marine-shipping related effects pathways to impacts based on review of publicly available information from RBT2 and TMX processes, and any information provided by Indigenous Groups during the MSA review. The EAO is satisfied that TMJ's marine shipping-related effects in the MSA area to access, quality of experience and SRKWs would be the pathways to impacts to Pacheedaht First Nation's other traditional and cultural interests.

The MSA reports on a traditional use and occupancy study for the RBT2 process wherein Pacheedaht First Nation identified canoe routes and travel corridors extending from the head of Port San Juan, following the coast and beyond Pacheedaht First Nation's territory, in addition to routes that access Swiftsure Bank and across the Strait of Juan de Fuca to Neah Bay. Pacheedaht First Nation has reported extensive trade with the Makah Tribe, including a long history of travel across the Strait of Juan de Fuca to maintain trade, relationships, and other cultural practices. Pacheedaht First Nation has raised concerns about safety while traveling across the Strait of Juan de Fuca, especially at Swiftsure Bank, arising from large vessel traffic and wake.

The EAO is aware that Swiftsure Bank is one of Pacheedaht First Nation's preferred areas to exercise their Aboriginal rights and title, that is still heavily used today; essential to support Pacheedaht diet, culture, and traditional economy; and is the site of hereditary fishing protocols. As described in the 2020 RBT2 Panel Report, Pacheedaht First Nation reported that concerns regarding safety and well-being from existing vessel traffic was preventing them from bringing children and youth there, which was causing lost opportunities to transfer

knowledge[368]. Pacheedaht First Nation reported that noise from large vessels in addition to the safety issues was diminishing the experience of their cultural practices.

The EAO understands that Swiftsure Bank is one of Pacheedaht First Nation's preferred areas to exercise its Aboriginal rights and title, and that Pacheedaht First Nation's historical control and use at Swiftsure Bank provided resources for not only subsistence, but also trade resources and wealth for Pacheedaht citizens. As described in the community profile section, the EAO is aware that the location of Pacheedaht First Nation's historical village and campsites provided Pacheedaht First Nation with access to its marine territory, including Swiftsure Bank. Pacheedaht First Nation consider that its Aboriginal interests in its marine territory include Aboriginal title and governance rights (e.g., decision making, authority and jurisdiction, management, and stewardship roles and responsibilities), as well as fishing rights for all purposes, including FSC, cultural, and economic fisheries. The EAO is aware that Pacheedaht First Nation are active in economic ventures related to the fishing industry that provide culturally based employment for Pacheedaht First Nation citizens.

The EAO is aware that Pacheedaht First Nation is culturally, spiritually, and hereditarily connected to many marine mammals found in the Strait of Juan de Fuca, and that whale in general are central to Pacheedaht First Nations culture, mythology, and cosmology. To Pacheedaht First Nation, Orca are regarded with great spiritual significance to governance, and are central to Pacheedaht First Nation's oral tradition and cultural practices, such as the wolf ritual. Pacheedaht First Nation has informed the EAO that SRKW plays an important role in Indigenous culture and that TMJ-related shipping would impact this culture.

Pacheedaht First Nation raised the following concerns regarding potential impacts related to traditional and cultural interests due to TMJ:

- Concern that increase in vessel traffic will worsen effects that have occurred, preventing Pacheedaht First Nation families from being able to travel to Swiftsure Bank on small vessels (e.g., herring skiffs), with TMJ failing to reflect Pacheedaht First Nation people's view, understanding and experience.

The EAO does not dispute Pacheedaht First Nation's worldview and perspective that effects have already occurred due to vessel traffic that prevent families from being able to travel to Swiftsure Bank on small vessels. As described in the Current Use assessment in Part B, the EAO concluded that that regular TMJ-related vessel transits during operations (30 years minimum)

[368] Review Panel for the Roberts Bank Terminal 2 Project. 2020. Federal Review Panel Report for the Roberts Bank Terminal 2 Project. https://iaac-aeic.gc.ca/050/documents/p80054/134506E.pdf. Reference No. 2062. Accessed June 22, 2022.

could cause relatively infrequent and short-duration interruptions to access and quality experience. TMJ-related shipping combined with cumulative effects from other marine shipping could result in significant cumulative effects to cultural heritage at Swiftsure Bank for Pacheedaht First Nation members. See the EAO's conclusions in the Current Use of Lands and Resources for Traditional Purposes chapter for more information.

    - The EAO is proposing KMMs under CEAA 2012 for a Marine Communication plan that would require TJLP to communicate traffic schedules, and have a process for Indigenous Groups to submit any feedback on potential adverse effects on navigation as a result of TMJ, and for TJLP to document and respond to any feedback received in a timely manner. TJLP has stated that TMJ's influence on TMJ-related vessel operations would be limited beyond TMJ's marine terminal area (including the location and operation of international shipping lanes), TJLP has committed to a Marine Communication Plan out to 12 nm that would be developed in consultation with Schedule B and D Indigenous Groups and include a communication procedure to inform Indigenous Groups of vessel schedules and provide for a complaint submission process.

- The EAO also is aware that TC has been working closely with Pacheedaht First Nation as an OPP EMSA initiative pilot host community to support local and collaborative planning, analysis and decision making. The EAO also understands that CCG is also continuing engagement with Pacheedaht First Nation through the Port Renfrew Multi-Purpose Marine Response Facility Project under the TMX CDCR. The EAO notes that these, and other existing regional Government of Canada initiatives associated with the OPP (e.g., CEMS or CPFP) and accommodations originating from TMX (e.g., SSI or MSET) are designed to improve Indigenous communities participation in marine safety systems in Canada and may collectively reduce effects within the region. However, the EAO acknowledges that these programs are broad in nature and are not intended to mitigate or accommodate for the specific potential impacts to Indigenous mariners and fishers navigating in proximity to TMJ vessels within the established Traffic Separation Scheme of the Salish Sea.
- Concern regarding TMJ's contribution to cumulative adverse effects on SRKWs, which are a species or incredible cultural and spiritual significance to Pacheedaht First Nation people. Concern that the MSA Application failed to address potential for impacts on cultural heritage values related to SRKWs.

    - See Section 13.3.3 for a detailed discussion of the analysis and resolution of concerns related to TMJ's potential effects on whales. As discussed in Section 13.3.3, the EAO concluded that TMJ would not result in significant residual

effects to Marine Mammals; however, the EAO notes that the current baseline of cumulative effects to SRKWs are already high and that TMJ would contribute additional residual effects from shipping-related underwater noise and potential avoidance behaviour by SRKWs to ships, such that there is a potential for cumulative effects to SRKWs to be significant.

- In Part B section on Current Use of Land and Resources for Traditional Purposes and Cultural Heritage (Section 11.4), the EAO concluded that TMJ would have significant adverse cumulative effects on intangible cultural heritage, for Indigenous Groups that have a cultural and spiritual connection to SRKWs, including Pacheedaht First Nation.
- TJLP has stated that TMJ's influence on TMJ-related vessel operations would be limited beyond TMJ's marine terminal area, but TJLP has committed to a Vessel Traffic Management Plan that would require TJLP to incorporate contractual measures to support participation of TMJ-related vessels in the VFPA-led ECHO Program seasonal slowdown initiatives (as amended) or a future equivalent, and annual reporting on TJLP's participation in regional environmental management measures and cumulative effects monitoring to protect SRKW, where feasible. The seasonal slowdown initiatives currently request vessels to slow down in key SRKW foraging areas such as Swiftsure Banks, Haro Strait and Boundary Pass.
- The EAO also notes several Government of Canada initiatives and measures have been implemented to better understand and manage cumulative effects on the recovery of SRKWs (see Section 13.1.1).

Additional issues and concerns with potential impacts related to traditional and cultural interests were raised by Pacheedaht First Nation during the EAs of RBT2 and TMX.

- Concern about the effect of a vessel's wake on intertidal shoreline habitat, archaeological sites, and shoreline erosion.
  - It was determined that the TMJ-related vessel wake would be within natural variation of the wave heights in this area, see the Vessel Wake Section of Part B (Section 5.4).
- Concern that vessel traffic has potential to disturb Pacheedaht First Nation connection to lands and water and ability to transfer traditional knowledge, including knowledge regarding traditional fishing and harvesting, especially regarding Swiftsure Bank; Concern regarding visual impacts of increased marine traffic decreasing the enjoyment of Pacheedaht First Nation members at traditional use sites.
  - In Part B the EAO predicted that vessel transits would result in negligible to low

magnitude effects to access to areas for resource harvesting for cultural purposes due to relatively infrequent and short-duration access disruption and visual quality, noise, and vessel wake (with an increasing magnitude of effect the closer one is to the vessels).

- The EAO acknowledges that wakes generated by TMJ vessels would be larger the closer one is to the vessel and that the presence of LNG carriers may be considered disturbing for safety or other reasons by Indigenous people, which could lead to reduced opportunities to practice Aboriginal rights in and around the shipping lanes.
- The EAO considers that the safety of small vessels with large vessels and wake effects were assessed in the Accidents and Malfunctions and Effects of the Environment Sections of Part B and that TMJ-related vessels transiting through the Salish Sea would include monitoring of compliance with maritime regulations and legislation such as the *Canada Shipping Act* and the Collision Regulations.
- TJLP has stated that TMJ's influence on TMJ-related vessel operations would be limited beyond TMJ's marine terminal area (including the location and operation of international shipping lanes), TJLP has committed to a Marine Communication Plan out to 12 nm that would be developed in consultation with Schedule B and D Indigenous Groups and include a communication procedure to inform Indigenous Groups of vessel schedules and provide for a complaint submission process. However, the EAO acknowledges that the TMJ-specific mitigation measures would not reduce impacts to quality of experience because some Indigenous people may find the presence and sounds of LNG carriers disturbing for safety and/or aesthetic reasons, or for other reasons.
- The EAO acknowledges that shipping-related access interruptions and concerns about safety could then lead to reduced opportunities for cultural transmission while undertaking traditional activities in the marine environment.

- Concern regarding potential of vessel-related contamination/discharge or damage to resources and habitat (including shoreline and intertidal) relied upon for the exercise of Pacheedaht First Nation's harvesting rights in the event of an accident or malfunction resulting in release of bunker fuel, other contaminants or sewage, especially at Swiftsure Bank. In addition, concern about effects to drinking water sources, such as river estuaries of San Juan and Gordon Rivers, from discharge due to accident or malfunction, as well as overall effects on water quality at cultural and harvesting sites.
  - As discussed in the Accidents and Malfunctions and Effects of the Environment section of Part B, vessels would be required to comply with internationally

recognized safety standards that include pollution prevention from ships, including Canada's Ballast Water Regulations.

- TJLP has stated that TMJ's influence on TMJ-related vessel operations would be limited beyond TMJ's marine terminal area, TJLP has committed to developing a Marine Shipping Emergency Response Outreach Program that would facilitate the integration of plans for responding to incidents in transit into existing emergency response systems, primarily the CCG's Incident Integrated Response Plans.
- As well, it was determined that with the mitigation measures in place, including navigational requirements, vessel operational procedures, emergency response measures and emergency spill response that would be supported by CCG, that these concerns would be addressed.
- The EAO also understands that CCG is also continuing engagement with Pacheedaht First Nation through the Port Renfrew Multi-Purpose Marine Response Facility Project under the TMX CDCR.

Conclusion

The EAO predicts the TMJ-related marine shipping effects alone would have **negligible-to-minor** impacts on Pacheedaht First Nation's other cultural and traditional interests, although the EAO acknowledges that there is uncertainty in the relationship between incremental increases in shipping, the availability of cultural resources such as SKRW and impacts to cultural interests. The EAO considers TMJ-related increases to vessel traffic in the established TSS of the Salish Sea during operations would be incremental compared to existing baseline conditions. However, in consideration of the available information, the EAO's consultation with Pacheedaht First Nation, TJLP's engagement with Pacheedaht First Nation, TJLP's commitments, the EAO's proposed EAC conditions if an EAC is issued, and the recommended KMMs under CEAA 2012, the EAO concludes that TMJ-related marine shipping effects combined with cumulative effects in the MSA area is expected to result in **moderate-to-serious** impacts on Pacheedaht First Nation's other traditional and cultural interests. The EAO predicts that TMJ-related marine shipping activities during operations would overlap with current baseline levels of cumulative effects to underwater noise to culturally important SRKWs and access to and quality of experience for cultural-use areas in, or adjacent to, the shipping lanes. These cumulative effects in the MSA area combined with the importance of Swiftsure Bank as a key cultural area for Pacheedaht First Nation and the location of the shipping lanes overlapping this area increase the seriousness of impact of TMJ on Pacheedaht First Nation's other cultural and traditional interests.

The EAO considered Pacheedaht First Nation's perspectives on cumulative effects and Pacheedaht First Nation's ability to access and use Swiftsure Bank for other cultural and traditional purposes, including intergenerational knowledge transfer, as Pacheedaht First Nation would prefer to do so. The EAO acknowledges that there is already many vessels transiting the shipping lanes which can impact access and quality of experience for other cultural and traditional purposes. The EAO understands that shipping-related access disruptions and concerns about safety currently contribute to reduced opportunities for cultural transmission and constrain Pacheedaht First Nation's traditional familial and trading/bartering relationships south of the border. While the EAO recognizes there is some uncertainty when considering how cumulative effects impact Aboriginal Interests, the EAO agrees with Pacheedaht First Nation, that any increase in vessel traffic at Swiftsure Bank would potentially be more serious when combined with past, present and reasonably foreseeable shipping activities.

The EAO also notes several Federal regional initiatives and measures have been implemented to better understand and manage cumulative effects on the recovery of SRKWs (listed in Section 13.1.1). The EAO also understands there are eligible opportunities for Pacheedaht First Nation's participation in the Whales Initiative's TSS Feasibility Study, CEMS, MSET, or the Indigenous and Multi-Stakeholder Advisory Group and Technical Working Groups for the Salish Sea Initiative. For some initiatives funding is available through the OPP's CPFP. The EAO also understands that TC has been working closely with Pacheedaht First Nation as an OPP EMSA initiative pilot host community to support local and collaborative planning, analysis and decision making. CCG is also continuing engagement with Pacheedaht First Nation through the Port Renfrew Multi-Purpose Marine Response Facility Project under the TMX initiative CDCR. The EAO notes that these programs are broad in nature and are not intended to mitigate or accommodate for the specific potential impacts to Indigenous mariners and fishers navigating in proximity to TMJ vessels within the established TSS of the Salish Sea.

The key factors that were considered in support of EAO's conclusion on the impacts to other traditional and cultural interests are summarized as follows:

Cultural and Heritage Resources:

- The EAO's conclusions in Part B found no residual effects to Heritage Resources (Section 7.1) from erosion due to wake effects along the shorelines of the MSA area
- The EAO's conclusions in Part B section on Marine Mammals, which found low to moderate magnitude residual effects on marine mammals and significant cumulative effects to due to underwater vessel noise
- The MSA area, including Swiftsure bank is a heavily utilized marine environment with

occasionally high levels of marine traffic in the shipping lanes.

Geospatial:

- Swiftsure Bank is a key area for cultural activities including the transmission of knowledge
- Swiftsure Bank is intersected by shipping lanes, where cumulative effects from shipping traffic is a constraint on Pacheedaht First Nation's ability to access and use the site for other cultural and traditional purposes, including both direct and indirect impacts to access, safety, and quality of experience
- Pacheedaht First Nation also conducts journeys across the shipping lanes to maintain kinship ties, trade, and other cultural practices at Neah Bay in the United States
- The EAO's conclusions in the Current Use chapter of Part B that TMJ would result in an incremental increase (i.e., 0.2 - 1.1 % for segments A – D) in vessel traffic when compared to baseline conditions in the Traffic Separation Scheme and that TMJ-related vessel transits during operations (minimum 30 years) would result in negligible to low magnitude effects due to relatively infrequent and short-duration disruptions to access in the Salish Sea when compared to existing baseline conditions; and
- The predicted overlap of TMJ-related shipping activities with cumulative effects from current and reasonably foreseeable shipping activities that would further constrain Pacheedaht First Nation's ability exercise other cultural and traditional practices, such that impacts may be compounded at Swiftsure Bank.

Social, Cultural, Experiential:

- Potential negligible to low impacts from the incremental increase due to TMJ-related vessel traffic during operations affecting visual quality, noise, and vessel wake (with an increasing magnitude of effect the closer one is to the vessels);
- Pacheedaht First Nation has noted that the degree of vessel traffic at Swiftsure has already surpassed a critical threshold in terms of safety risk and the experience of conducting cultural activities. This has already had an impact with members avoiding bringing children and young which is causing lost opportunities to transfer knowledge;
- Potential concerns regarding safety of small vessels with large vessels and wake effects, as assessed in the Accidents and Malfunctions and Effects of the Environment section in Part B;
- Pacheedaht First Nation identify Aboriginal title and governance rights are inclusive of its marine territory, which includes decision making, authority and jurisdiction,

management and stewardship roles and responsibilities.

- Swiftsure Bank is recognized as an important traditional harvesting area, that is still heavily used today, and is considered by Pacheedaht First Nation to be essential to support Pacheedaht diet and culture (including its trade and economic ventures); and
- Southern Resident Killer Whales plays an important role in Pacheedaht First Nation's culture.

Mitigations:

- Proposed mitigations for potential impacts to traditional and cultural interests, are the recommended key mitigations under CEAA 2012 for a Marine Communications and Vessel Traffic Management Plans and Marine Shipping Emergency Response Outreach Program;
- The EAO is recommending as KMMs under CEAA 2012 a Vessel Traffic Management Plan that would require TJLP to incorporate contractual measures to support participation of TMJ-related vessels in the VFPA-led ECHO Program seasonal slowdown initiatives and annual reporting on TJLP's participation in regional environmental management measures and cumulative effects monitoring to protect SRKW, where feasible; and
- While the EAO is of the view that the potential impacts on Pacheedaht First Nation's fishing rights have been avoided, minimized, and accommodated to the extent possible for the purposes of the EA, the EAO also recognizes that there are outstanding impacts, in particular regarding cumulative effects, and these outstanding impacts are reflected in the EAO's conclusions in Part B and Part C for TMJ.

16.3 DITIDAHT FIRST NATION

16.3.1 COMMUNITY PROFILE

Ditidaht means "people of *diitiida*." *Diitiida* was a village at the mouth of the Jordan River (now in Pacheedaht territory) from which the Ditidaht migrated. Ditidaht First Nation traditional territory is located on the west coast of Vancouver Island, stretching from the lands and waters between Bonilla and Pachena Points, extending inland to include Nitinaht and Cowichan Lakes, and extending offshore into the Strait of Juan de Fuca to where it meets the Pacific Ocean and as far as the mountains of Vancouver Island. Ditidaht First Nation assert that they have continuously and extensively occupied their territory since time immemorial and continue to maintain active spiritual connections to their lands and waters. Marine resources were central to the pre-Contact Ditidaht diet and economy. Reserves at Ditidaht were established to ensure

access to fishing areas but encompass only a fraction of Ditidaht First Nation territory. Ditidaht First Nation has reported that fisheries regulations and park creation later prevented commercial fishing and limited their rights.

As of November 2021, the registered Ditidaht First Nation population was 776 people (168 living on their own reserve, 544 living off the reserve and 64 living on other reserves)[369], while the pre-contact population was approximately 30,000 people. Ditidaht First Nation has noted that, since contact, cumulative effects have adversely affected their people, territory, and rights. These include introduced disease, Indian Reserve creation, loss of language and culture through Indian Residential Schools and the Potlatch Ban, industrial logging, park creation, and fishing regulations and industrial fisheries.

The Ditidaht First Nation's traditional role is as stewards of their marine territory, which is integral to their rights, culture, spirituality, and livelihoods. Ditidaht First Nation's traditional, spiritual, holistic resource management system called *ooch-ah-uk,* means "to take care of," and stipulates that you harvest only what the resource can support and that you switch harvests between more abundant species. Ditidaht First Nation view whales as supernatural creatures; whaling was a ritualized, ceremonial, and spiritual practice. Humpback, grey, and northern right whales were Ditidaht First Nation's preferred species. Commercial whaling increased in the early 1900s, causing a sharp decline in local whale populations and an end to Native whaling.

Ditidaht First Nation express their rights to self-governance, self-determination, and Aboriginal title and anticipate future Treaty Rights. Ditidaht First Nation consider that they hold the rights and responsibilities that come with being the traditional stewards of their marine territory, including the right to make management decisions respecting the sustainable harvest of marine resources. Ditidaht First Nation has stated that they have Aboriginal rights and title to their traditional territory, including *ƛ̓ušiiʔaaʔaq* (Swiftsure Bank), Nitinat Narrows, and the tidal Nitinat Lake. These areas are the basis for Ditidaht First Nation's way of life, rights, culture, economy, and passing on of culture and identity to future generations. Staple foods include salmon, halibut, groundfish, mussels, barnacles, sea urchins, whale, seal, deer, moose, elk, roots, fruits, and berries. Food is harvested based on the season, preserved for the winter, and surpluses exchanged through redistribution in a seasonal round that continues today. Fishing and seafood gathering, both for commercial, food, social, and ceremonial purposes, are critical for Ditidaht First Nation's economy, active expressions of Ditidaht First Nation culture and

[369] Indigenous and Northern Affairs Canada. 2021. First Nation Profiles – Ditidaht First Nation. https://fnp-ppn.aadnc-aandc.gc.ca/fnp/Main/Search/FNRegPopulation.aspx?BAND_NUMBER=662&lang=eng, accessed December 16, 2021.

identity, and tied to sacred and storied landscapes. Ditidaht First Nation has stated that it has the right to access and eat traditional foods and engage in place-based cultural practices.

Swiftsure Bank is a crucial and preferred site for marine harvesting and travel for Ditidaht First Nation and is renowned for ecological abundance and cultural values. Ditidaht First Nation people exercise their Aboriginal fishing rights at Swiftsure Bank, which is key to the spiritual, social, ceremonial, and economic aspects of Ditidaht First Nation life. The MSA noted that Ditidaht First Nation share this area with Pacheedaht and the Makah Tribe from Neah Bay (USA) under established protocols.

The MSA included details on a Ditidaht First Nation traditional marine use and occupancy study prepared for the TMX process. The Study noted use throughout their territory in areas overlapping the TMJ MSA area and pointed to the way colonization has affected the way Ditidaht First Nation practice their rights and culture and also shows their active and spiritual connection to their lands and marine territory.

Ditidaht First Nation is currently in the BC Treaty negotiation process (negotiating at a common table with Pacheedaht). Of the six-stage process, Ditidaht First Nation is in stage 5 (Negotiation of an Agreement-in-Principle) of the BC Treaty process. Negotiations are ongoing and aim to conclude on an agreement in principle with Canada and BC. Ditidaht First Nation have identified that marine management is a significant issue in their discussions within Treaty Negotiations.

16.3.2 DITIDAHT FIRST NATION INVOLVEMENT IN THE CONSULTATION PROCESS

Consultation with Indigenous groups identified in Schedule D began in July of 2019 when EAO sent a letter to these groups, inviting comments on the draft Section 13 Order, including consultation processes and opportunities. On August 6, 2019, at the request of Canada, the EAO amended the geographic scope for the assessment of the marine shipping route under a Section 13 Order and added the Indigenous groups identified in Schedule D which included Ditidaht First Nation. For the review of the MSA, the EAO led consultation activities with the Indigenous groups identified in Schedule D and, as part of this work, invited Ditidaht First Nation to participate in the Marine Shipping Working Group. The EAO is of the view that it has approached consultation with Ditidaht Nation at the deeper end of the spectrum, with the intent to identify potential impacts and consider ways to address any potential impacts to Aboriginal Interests that were identified by Ditidaht Nation within the MSA area.

As part of the Marine Shipping Working Group, the EAO invited Ditidaht Nation to review and provide comments on TJLP's MSA Supplemental Analysis, the EAO's draft Assessment Report (including Part C of the Assessment Report), the draft CPD, draft Certificate Conditions and

recommended KMMs under CEAA 2012. As part of the Marine Shipping Working Group, Ditidaht Nation was invited to participate in Marine Shipping Working Group meetings and teleconferences during the MSA Supplemental Analysis Review stages. The EAO and TJLP met with Ditidaht First Nation during the MSA review to discuss the EA process, and any potential concerns with TMJ.

16.3.3 POTENTIAL IMPACTS TO ABORIGINAL INTERESTS

The following sections focus on potential impacts of TMJ to Ditidaht First Nation's Aboriginal Interests, and mitigations and accommodations to address potential impacts. Information related to the EAO's impact assessment methods is provided in Section 12.2 of this Report. The EAO considered information available, including from public sources as well as relevant issues raised by Ditidaht First Nation and members during the EA process (e.g., in meetings), in the following assessments of the potential impacts of TMJ on Ditidaht First Nation's Aboriginal Interests.

A. POTENTIAL IMPACTS ON FISHING

The EAO evaluated the potential effects of TMJ on Aboriginal fishing rights and provided a summary of this in Section 13.3.1. In addition, the EAO considered relevant information related to the potential shipping-related effects based on review of the RBT2 Panel and TMX EA processes. The EAO is satisfied that the key impacts to biophysical components resulting in changes to fish quantity and quality, changes in access to fishing resources, and changes to social, cultural, and spiritual values associate with traditional fishing activities that apply to Ditidaht First Nation are summarized in Section 13.3.1.

The MSA noted that Ditidaht First Nation harvests a wide variety of shellfish and fish in traditional fishing grounds throughout their territory. Key traditional fishing grounds in and around the shipping lanes include Swiftsure bank (overlaps shipping lanes), Carmanah Point and Bonilla Point (close to shipping lanes – however it does not require crossing the shipping lanes to access these latter two areas). The EAO notes the RBT2 Panel Report (2020) included information about Ditidaht First Nation's concerns about safety on the water as a result of large vessels due to wave wake and how Ditidaht First Nation has already changed their fishing practices to avoid collisions.

During the MSA review for TMJ, Ditidaht First Nation raised concerns related to accidents and environmental emergency spill response preparedness with respect to shipping LNG and posed questions about TJLP's role in spill response. The EAO has also noted Ditidaht First Nation concerns through the RBT2 process with respect to accidents and emergency spill response,

and contamination of the food chain due to shipping-related spills that could impact their members' health and wellbeing.

During the MSA review, TJLP provided through dialogue with Ditidaht First Nation more information about potential risks associated with TMJ shipping-related accidents and malfunctions for TMJ, including that the response in the very unlikely event of an LNG spill would involve different firefighting techniques and LNG is a non-persistent hazardous noxious substance. TJLP also described their role and the role of third-party responder like Western Canada Spill Response in responding to the unlikely event of a bunker oil-related spill.

- The EAO is recommending development of a Marine Shipping Emergency Response Outreach Program as a KMM under CEAA 2012 that would be scoped to the MSA area, to facilitate the integration of plans for responding to incidents in transit into existing emergency response systems, primarily the CCG's Incident Integrated Response Plans.
- The EAO is aware that for TMJ, Ditidaht First Nation consider having access to the correct equipment and training for Ditidaht First Nation vessel operations is high priority, and there is lower interest in information sharing about ship schedules. As mentioned above, the EAO's recommended KMM under CEAA 2012 for the Marine Shipping Emergency Response Outreach Program would include requirements for the delivery or arrangement by TJLP for LNG safety related courses for Indigenous Groups who may request training.

Additional issues and concerns with potential impacts related to fishing were raised by Ditidaht First Nation during the EAs of RBT2 and TMX. These concerns were not raised by Ditidaht First Nation during the TMJ EA but the EAO considers them applicable to the MSA area. During the MSA review for TMJ, Ditidaht First Nation noted that their shipping-related concerns raised for RBT2 were similar for TMJ.

- Concern regarding the impacts of commercial vessels travelling through Ditidaht First Nation's marine territory on fishing rights. Ditidaht First Nation expressed that the area is approaching tipping point where people no longer feel safe to go out and fish, which then has an effect on knowledge transfer. Ditidaht First Nation's identified that elders or youth are seldomly brought to Swiftsure Bank, which is deteriorating the traditional intergenerational transfer of knowledge concerning fishing at the Swiftsure Bank and this has created significant risks and threats to Ditidaht First Nation's use and interests.
    - The EAO respectfully acknowledges Ditidaht First Nation's worldview and perspective that there are currently existing cumulative effects which have already affected Ditidaht First Nation's ability to exercise their fishing rights as preferred within Ditidaht First Nation's asserted traditional territory. In the

Current Use in Part B of this Report the EAO concluded that TMJ would have the potential to contribute significant cumulative effects (that already occur at baseline) to access and the experience of current use for fishing for Ditidaht First Nation at Swiftsure bank. The EAO predicts TMJ shipping activities could result in short-duration interruptions to Ditidaht First Nation access and experience of current use for fishing occurring regularly during operations (30 years minimum).

- The EAO considers that the safety of small vessels with large vessels and wake effects were assessed in the Accidents and Malfunctions Section of Part B and that the regular and relatively short-duration passage of TMJ-related vessels through the Salish Sea would include monitoring of compliance with maritime regulations and legislation such as the *Canada Shipping Act* and the Collision Regulations.
- TJLP has stated that TMJ's influence on TMJ-related vessel operations would be limited beyond TMJ's marine terminal area (including the location and operation of international shipping lanes), but TJLP has committed to a Marine Communication Plan out to 12 nm that would be developed in consultation with Schedule B and D Indigenous Groups and include a communication procedure to inform Indigenous Groups of vessel schedules and provide a complaint submission process.
- With respect to TMJ-specific mitigations measures, the EAO acknowledges that these would not reduce impacts for baseline conditions and/ or impact of future projects, which are a source of issues for many Indigenous Groups. The EAO also considers that the TMJ-specific mitigation measures would not reduce impacts to quality of experience because some Indigenous people may find the presence and sounds of LNG carriers disturbing for safety and/or aesthetic reasons, or for other reasons. The EAO acknowledges that shipping-related access interruptions and concerns about safety could then lead to reduced opportunities for cultural transmission, including Indigenous language acquisition by younger generations while undertaking traditional harvesting activities on land or on the water, and in particular, while fishing.
- The EAO notes that existing regional Government of Canada initiatives associated with the OPP (i.e., CEMS, EMSA and CPFP) and accommodations originating from TMX (i.e., CDCR, SSI and MSET) are designed to improve Indigenous community's engagement participation in marine safety systems in Canada and may collectively reduce effects within the region. Although these initiatives are not TMJ-specific, the EAO recognizes that these programs are working towards a better understanding of cumulative effects in the Salish Sea and illustrate the efforts that are being undertaken by the Crown in relation to

past and future impacts that contribute to the "current state".

Conclusion

The EAO predicts that TMJ-related marine shipping effects would have a **negligible-to-minor** impact on Ditidaht First Nation's right to fish. The EAO considers TMJ-related increases to vessel traffic during operations would be incremental compared to existing baseline conditions of the established Traffic Separation Scheme in the Salish Sea. However, in consideration of the available information; the EAO's consultation with Ditidaht First Nation; Ditidaht First Nation's engagement with TJLP; TJLP's commitments; the EAO's proposed EAC conditions if an EAC is issued; and the recommended KMMs under CEAA 2012, the EAO concludes that TMJ-related marine shipping effects combined with cumulative effects in the MSA area is expected to result in a **moderate-to-serious** impact on Ditidaht First Nation's right to fish. The EAO predicts that TMJ-related shipping activities during operations would interact with current baseline levels of cumulative effects to access to fishing areas and the experience of fishing in, or adjacent to, the shipping lanes. These cumulative effects in the MSA area combined with the importance of Swiftsure Bank as the key fishing area for Ditidaht First Nation and the location of the shipping lanes overlapping this area increase the seriousness of impact of TMJ on Ditidaht's First Nation's right to fish.

The EAO considered Ditidaht First Nation's perspectives on cumulative effects and Ditidaht First Nation's ability to meaningfully practice their fishing rights in the MSA area. The EAO acknowledges that there are already vessels transiting the shipping lanes which can impact Indigenous fishers' access to and quality of experience of fishing. While the EAO recognizes there is some uncertainty when considering how cumulative effects impact Aboriginal Interests, the EAO agrees with Ditidaht First Nation, that any increase in vessel traffic at Swiftsure Bank would potentially be more serious when combined with past, present and reasonably foreseeable shipping activities.

The key factors that were considered in support of the EAO's conclusion on the impacts to the right to fish are summarized as follows:

Biophysical:

- The EAO's conclusions in the Fish and Fish Habitat chapter in Part B which does not predict any residual effects to fish and fish habitat in the MSA area; and
- The MSA area, including Swiftsure bank, is a heavily utilized marine environment with occasionally high levels of marine traffic in the shipping lanes.

Geospatial:

- Swiftsure bank is intersected by shipping lanes, where cumulative effects from shipping

traffic is a constraint on Ditidaht First Nation's ability to exercise their fishing rights, including both direct and indirect impacts to access, safety, and quality of experience;

- While Ditidaht First Nation has identified fishing sites that do not require crossing the shipping lanes to access, Swiftsure Bank is a prime resource harvesting location and important site for knowledge transfer for Ditidaht First Nation;
- The EAO considers TMJ would result in an incremental increase (i.e., 0.2 – 1.1 % for segments A – D) to vessel traffic when compared to baseline conditions in the Traffic Separation Scheme of the Salish Sea;
- The EAO's conclusions in the Current Use of Part B that TMJ-related vessel transits during operations (minimum 30 years) would result in negligible to low magnitude effects due to relatively infrequent and short-duration interruptions to access to areas in the Salish Sea; and
- The predicted overlap of TMJ-related shipping activities with cumulative effects from current and reasonably foreseeable shipping activities that would further constrain Ditidaht First Nation's ability to exercise their fishing rights, such that impacts may be compounded at Swiftsure Bank.

Social, Cultural and Experiential:

- Potential negligible to low impacts due to incremental increases from TMJ-related vessel traffic during operations affecting visual quality, noise, and vessel wake (with an increasing magnitude of effect the closer one is to the vessels);
- Ditidaht First Nation's concerns about safety on the water as a result of large vessels due to wave wake that have caused Ditidaht First Nation to already change their fishing practices to avoid collisions; and
- The predicted overlap of TMJ-related shipping activities with cumulative effects from current and reasonably foreseeable shipping activities that would further constrain Ditidaht First Nation's ability to exercise other cultural, social, and experiential components of their fishing rights, including intergenerational knowledge transfer, such that impacts may be compounded at Swiftsure Bank.

Mitigations:

- Proposed mitigations for impacts to Ditidaht First Nation's right to fish include the Marine Communications Plan recommended as KMMs under CEAA 2012; and

- The EAO acknowledges that these mitigation measures would not reduce impacts for baseline conditions and/ or impact of future projects, which are a source of issues for many Indigenous Groups.

In addition to Canada's marine safety and security system, The EAO notes that existing regional Government of Canada initiatives associated with the OPP (i.e., CEMS, EMSA and CPFP) and accommodations originating from TMX (i.e., CDCR, SSI and MSET) are designed to improve Indigenous communities engagement participation in marine safety systems in Canada and may collectively reduce effects within the region (See Section 13.1.1. of this Report). However, the EAO acknowledges that these programs are broad in nature and are not intended to mitigate or accommodate for the specific potential impacts to Indigenous mariners and fishers navigating in proximity to TMJ vessels within the established Traffic Separation Scheme of the Salish Sea. The Crown is committed to working with Indigenous people in shaping the initiatives to better understand cumulative effects in the Salish Sea, support informed decision-making, and the development of potential measures to manage cumulative effects by the ongoing collection and analyses of targeted data with Indigenous communities

B. POTENTIAL IMPACTS ON HUNTING, TRAPPING AND GATHERING

The EAO evaluated the potential effects on hunting, trapping and gathering rights attributable to TMJ in Section 13.3.2 above that apply broadly to Indigenous Groups. The EAO is satisfied that the key impacts to biophysical components resulting in changes to wildlife and vegetation quantity and quality, changes in access to hunting, trapping and gathering areas, and changes to social, cultural, and spiritual values associated with traditional hunting, trapping and gathering activities that apply to Ditidaht First Nation are summarized in Section 13.3.2. Ditidaht First Nation did not raise specific issues and concerns with potential TMJ impacts related to Ditidaht First Nation's rights to hunt, trap and gather during the TMJ EA.

The MSA noted a variety of bird species that Ditidaht First Nation harvested for traditional purposes including mallard duck and other intertidal birds, surf scoter, common merganser, bufflehead duck, common goldeneye, Canada goose, brant, and trumpeter swan. The MSA noted that surf scoter is a traditional winter staple in the diet and Goldeneye is also a favoured species.

Conclusion

In consideration of the available information in Section 13.3.2, which outlines the potential effect to hunting, trapping and gathering; consultation with Ditidaht First Nation; Ditidaht First Nation's engagement with TJLP; TJLP's commitments; the EAO's proposed EAC conditions if an

EAC is issued and the recommended KMMs under CEAA 2012, TMJ is expected to result in **negligible** impact on Ditidaht First Nation's right to hunt, trap and gather.

The key factors that were considered in support of the EAO's conclusion on the impacts to the right to hunt, trap and gather included the EAO's conclusions on adverse residual effects to wildlife in the MSA area predict negligible to low magnitude mortality of select marine bird species. The EAO also considered that in the MSA area, operations (30 years in duration) may cause infrequent, short-term, temporary disruptions to marine-based hunting along the proposed LNG vessel route and negligible effects on Indigenous access to terrestrially based hunting, trapping, and gathering sites that are accessed by boat from the pilot station at Sand Heads to the 12 nm territorial limit.

To mitigate potential impacts to Ditidaht First Nation's right to hunt, trap and gather, the EAO is recommending a KMM under CEAA 2012 for a Marine Communication Plan, including procedures to inform Indigenous Groups of traffic schedules and for Indigenous Groups to submit any feedback on potential adverse effects on navigation as a result of TMJ. The EAO also considered that the small relative increase due to TMJ-related vessel traffic would have a negligible effect to experiential aspects of hunting, trapping, and gathering from changes to visual quality and noise in the MSA and that all TMJ related vessels would adhere to the Marine Regulations and Legislation regulating vessel noise and lighting.

C. POTENTIAL IMPACTS ON OTHER TRADITIONAL AND CULTURAL INTERESTS

The EAO evaluated the potential for TMJ-related residual and cumulative effects to impact other traditional and cultural interests of Indigenous Groups in the MSA, as summarized in Section 13.3.3. In its evaluation, the EAO considered potential marine-shipping related effects pathways to impacts based on review of publicly available information from RBT2 and TMX processes, and any information provided by Indigenous Groups during the MSA review. The EAO is satisfied that TMJ's marine shipping-related effects in the MSA area to access, quality of experience and SRKWs would be the pathways to impacts to Ditidaht First Nation's other traditional and cultural interests.

The MSA reported that orcas hold a particular spiritual significance to Ditidaht First Nation and are revered as sacred. The MSA explained that the sites and species Ditidaht First Nation rely on for traditional purposes and the language, named places and other traditional knowledge associated with them create a link to Ditidaht First Nation territory and identity. Ditidaht First Nation have noted that shipping traffic constrains traditional activities and hinders the transmission of knowledge regarding harvesting techniques. At Swiftsure Bank, the RBT Panel Report (2020) noted that safety concerns were already impacting Ditidaht First Nation's use of the area and were stopping members from bringing their children and youth there. This was creating lost opportunities to teach traditional knowledge.

The MSA reported on travel routes that overlap with the shipping lanes including an anchorage and two maritime travel routes that cross the Strait of Juan de Fuca (one from Bonilla Point to Neah Bay and the other from Port Renfrew to Neah Bay). There are other marine travel sites in the MSA (e.g., along Ditidaht's territorial shoreline and within Nitinat Lake). The MSA noted that there were hundreds of cultural sites across the MSA including aquatic and land resource sites (such as fishing, hunting and seafood gathering, trapping, water supply, plant gathering) cultural history sites (e.g., burial sites conflict, reserves, Legendary Being, marker sites, pictograph/petroglyph, sacred and ceremonial, traditional history), settlement activity sites (e.g., burial and dwellings), archaeology sites and travel sites (such as canoe and anchorage points). Ditidaht has explained these sites are integral to their culture and connect them to the landscape.

Ditidaht First Nation raised the following concerns regarding potential impacts related to traditional and cultural interests due to TMJ:

- Concern regarding impact of spill in Ditidaht First Nation territory adversely affecting availability, quality, and safety for the exercise of Ditidaht First Nation's Aboriginal rights and culture.
    - As described in the Accidents and Malfunctions Section of this Report, the MSA predicted TMJ would have moderate residual risk of LNG release causing SRKWs mortality or irreversible damage to heritage resources, which were considered to result in high severity of consequences. However, the likelihood of such an event occurring was estimated to be extremely rare as the release would need to occur in the vicinity of a SRKWs or heritage resource.
    - The EAO concluded in the Fish and Fish Habitat Section of this Report that TMJ would not result in any residual effects to fish or fish habitat in the MSA area.
    - TJLP has stated that TMJ's influence on TMJ-related vessel operations would be limited beyond TMJ's marine terminal area, but TJLP is committed to developing a Marine Shipping Emergency Response Outreach Program that would facilitate the integration of plans for responding to incidents in transit into existing emergency response systems, primarily the CCG's Incident Integrated Response Plans.

Conclusion

The EAO predicts the TMJ-related marine shipping effects alone would have **negligible-to-minor** impacts on Ditidaht First Nation's other cultural and traditional interests, although the EAO acknowledges that there is uncertainty in the relationship between incremental increases in shipping, the availability of cultural resources such as SRKW and impacts to cultural interests.

The EAO considers TMJ-related increases to vessel traffic in the established Traffic Separation Scheme of the Salish Sea during operations would be incremental compared to existing baseline conditions. However, in consideration of the available information, the EAO's consultation with Ditidaht First Nation, Ditidaht First Nation's engagement with TJLP, TJLP's commitments, the EAO's proposed EAC conditions if an EAC is issued, and the recommended KMMs under CEAA 2012, TMJ-related marine shipping effects combined with cumulative effects in the MSA area is expected to result in **moderate-to-serious** impacts on Ditidaht First Nation's other traditional and cultural interests. The EAO predicts that TMJ-related marine shipping activities during operations would overlap with current baseline levels of cumulative effects to underwater noise to culturally important SRKWs and access to and quality of experience for cultural-use areas in, or adjacent to, the shipping lanes. These cumulative effects in the MSA area combined with the importance of Swiftsure Band as a key cultural area for Ditidaht First Nation and the location of the shipping lanes overlapping this area increase the seriousness of impact of TMJ on Ditidaht First Nation's other cultural and traditional interests.

The EAO considered Ditidaht First Nation's perspectives on cumulative effects and Ditidaht First Nation's ability to access and use Swiftsure Bank for other cultural and traditional activities, including transmission of knowledge regarding harvesting techniques and use of travel routes or traditional forms of transportation (i.e., dugout canoes). The EAO acknowledges that there is already many vessels transiting the shipping lanes which can impact access and quality of experience for other cultural and traditional purposes. While the EAO recognizes there is some uncertainty when considering how cumulative effects impact Aboriginal Interests, the EAO considers, that any increase in vessel traffic at Swiftsure Bank would potentially be more serious to Ditidaht First Nation's other cultural and traditional interests when combined with past, present and reasonably foreseeable shipping activities.

The EAO notes several Federal regional initiatives and measures have been implemented to better understand and manage cumulative effects on the recovery of SRKWs and (listed in Section 13.1.1). The EAO also understands there are eligible opportunities for Ditidaht First Nation's participation in the Whales Initiative's TSS Feasibility Study, CEMS, MSET, CDCR or the Indigenous and Multi-Stakeholder Advisory Group and Technical Working Groups for the Salish Sea Initiative. For some initiatives funding is available through the OPP's CPFP. The EAO notes that these programs are broad in nature and are not intended to mitigate or accommodate for the specific potential impacts to Indigenous mariners and fishers navigating in proximity to TMJ vessels within the established TSS of the Salish Sea.

The key factors that were considered in support of the EAO's conclusion on the impacts to other traditional and cultural interests are summarized as follows:

Cultural and Heritage Resources:

- The EAO's conclusions in Part B of this Report found no residual effects to Heritage Resources (7.1) from erosion due to wake effects along the shorelines of the MSA area;
- The EAO's conclusions in Part B section on Marine Mammals, which found low to moderate magnitude residual effects on marine mammals and significant cumulative effects to SRKWs due to underwater vessel noise; and
- The MSA area, including Swiftsure bank, is a heavily utilized marine environment with occasionally high levels of marine traffic in the shipping lanes.

Geospatial:

- Swiftsure Bank is a key area for cultural activities including the transmission of knowledge and the shipping lanes go through a portion of Swiftsure Bank;
- Ditidaht First Nation conduct journeys across the shipping lanes to maintain kinship ties, trade, and other cultural practices at Neah Bay in the United States;
- The EAO's conclusions in the Current Use chapter of Part B that the incremental increase (i.e., 0.2 - 1.1 percent% for segments A – D) due to TMJ-related vessel transits during operations (minimum 30 years) would result in negligible to low magnitude effects due to relatively infrequent and short-duration interruptions to access to fishing areas in the Salish Sea compared to existing baseline conditions; and
- The predicted overlap of TMJ-related shipping activities with cumulative effects from current and reasonably foreseeable shipping activities that would further constrain Ditidaht First Nation's ability exercise other cultural and traditional practices, such that impacts may be compounded at Swiftsure Bank

Social, Cultural, Experiential:

- Potential negligible to low impacts from the incremental increase due to TMJ-related vessel traffic during operations affecting visual quality, noise, and vessel wake (with an increasing magnitude of effect the closer one is to the vessels;
- Potential concerns regarding safety of small vessels with large vessels and wake effects, as assessed in the Accidents and Malfunctions and Effects of the Environment section in Part B; and
- SRKWs plays an important role in Ditidaht First Nation culture.

Mitigations:

- Proposed mitigations for potential impacts to traditional and cultural interests are the

recommended key mitigations under CEAA 2012 for Marine Communications and Vessel Traffic Management Plans, and a Marine Shipping Emergency Response Outreach Program;

- The EAO is recommending as KMMs under CEAA 2012 for a Vessel Traffic Management Plan that would require TJLP to incorporate contractual measures to support participation of TMJ-related vessels in the VFPA-led ECHO Program seasonal slowdown initiatives (as amended) or a future equivalent, and annual reporting on TJLP's participation in regional environmental management measures and cumulative effects monitoring to protect SRKW, where feasible. The seasonal slowdown initiatives currently request vessels to slow down in key SRKW foraging areas such as Swiftsure Banks, Haro Strait and Boundary Pass; and
- The EAO acknowledges that these mitigation measures would not reduce impacts for baseline conditions and/ or impact of future projects, which are a source of issues for many Indigenous Groups.

16.4 PAUQUACHIN FIRST NATION

16.4.1 COMMUNITY PROFILE

BOḰOĆEN (Pauquachin) First Nation, meaning "Earth bluff", is one of the Indigenous Groups constituting the W̱SÁNEĆ (Saanich) people, which are a Coast Salish cultural group of people that has occupied the Strait of Georgia continuously for thousands of years. Pauquachin First Nation is a small community located on the western side of the Saanich Peninsula on Vancouver Island. As of November 2021, Pauquachin First Nation had a registered population of 415 people (230 living on own reserve, 150 living off reserve and 35 living on other reserves)[370].

From time immemorial, Pauquachin First Nation villages faced the sea along Vancouver Island's shores; the ocean was their front door, breadbasket, and foundation of their economies, laws, customs, and myths. Before contact, the W̱SÁNEĆ Nations were a single group of extended families sharing the SENĆOŦEN language and a cultural order revolving around their relations with marine creatures, spirit beings, and one another. The relationship of the W̱SÁNEĆ with their marine environment drives their society, health, economy, culture, and identity.

[370] Indigenous and Northern Affairs Canada. 2021. First Nation Profiles – Pauquachin First Nation, https://fnp-ppn.aadnc-aandc.gc.ca/fnp/Main/Search/FNRegPopulation.aspx?BAND_NUMBER=652&lang=eng, accessed December 16, 2021.

XWSANETS (Saanich Peninsula) is the “homebase” of the W̱SÁNEĆ. It derives its name from the image presented to paddlers in a canoe as they approach from the water, meaning “raised up” or “emerging people.” The naming practice based on the perspective of the water reveals the fundamental nature of marine territory to the W̱SÁNEĆ worldview which sees nature as a source of supernatural powers and considers food a sacred gift from these powers. All living things were relatives, transformed and given to the W̱SÁNEĆ as gifts; salmon were thus addressed as “Elder brother.” The W̱SÁNEĆ view themselves as equal to and inseparable from the environment. This is the basis of the W̱SÁNEĆ stewardship system based on respect for and spiritual connection to salmon and KELŁOLEMEĆEN (orcas), the earth, and each other, allowing the W̱SÁNEĆ to thrive for millennia. One ritual the W̱SÁNEĆ practiced demonstrating respect was to release some salmon to ensure they could return home and allow their lineages to continue.

W̱SÁNEĆ families had permanent winter settlements on the Saanich Peninsula and temporary settlements throughout the San Juan and southern Gulf Islands and across the Salish Sea to Point Roberts and Boundary Bay. This territory is defined by the pursuit of the five salmon species and steelhead and is where the W̱SÁNEĆ have continuous and exclusive use and occupation since time immemorial. The 1987 Saanich Declaration describes W̱SÁNEĆ territory as “[encompassing] all [their] Spiritual Places, medicine and fruit gathering places, fishing stations, hunting and trapping areas, winter and summer homesites, burial sites, meditation places and all our territories in between these places.” W̱SÁNEĆ families exploited different ecological niches, had tailored seasonal movements, and shared resources with each other in a reciprocal system. The W̱SÁNEĆ had reef net fishing sites throughout their territory, with the Nation’s largest immemorial reef net claim at Point Roberts and another on ŚNEWIŁ (the Fraser River).

Pauquachin First Nation has Douglas Treaty Rights to hunt over unoccupied lands and carry on their fisheries “as formerly”. The W̱SÁNEĆ signed the Douglas Treaty (1852) during a time of escalating tension between the W̱SÁNEĆ and white settlers. The W̱SÁNEĆ viewed the treaty as a peaceful agreement between two nations that would ensure the continuation of W̱SÁNEĆ fisheries, lifestyle, culture, resource management and governance systems as formerly. By the mid-19th century, most W̱SÁNEĆ families had relocated to Saanichton Bay due to disease spread by European contact, raids from northern First Nations, and land pre-emptions by white settlers. This is when the village site Pauquachin First Nation was founded or reoccupied on Cole Bay.

The Pauquachin First Nation use the Salish Sea to hunt, fish, gather, travel, and harvest which varies according to the season and traditional W̱SÁNEĆ calendar. Marine foods are the preferred Pauquachin First Nation diet (including clams, oysters, mussels, and chitons), for

subsistence, health, and spiritual reasons. Some W̱SÁNEĆ continue to earn a living and feed their communities through fishing. The W̱SÁNEĆ continue to gather seaweed and hunt deer and ducks on islands near the shipping lanes. Herring and herring roe were traditionally harvested in the area but at lower levels now due to frequent ship traffic. Bivalves play a significant role in feeding the community as well as sea urchin, but Pauquachin First Nation have noted that they are now unfortunately unavailable in many locations.

The Coast Salish are sometimes called the "salmon people" due to heavy reliance on salmon for seasonal rounds and cultural practices. ŦEKI (sockeye) is the most prized species of the Coast Salish. Fish were caught using the unique reef net, as well as gaffs, harpoons, and dip and trawl nets. Reef net fishing is a way of life and is part of the W̱SÁNEĆ identity. It plays a central role in W̱SÁNEĆ cosmology, seasonal round, and societal organization, and demonstrates the continual use of salmon by the W̱SÁNEĆ since time immemorial. Reef nets were outlawed by the Canadian government in 1916 but the W̱SÁNEĆ are now working to revive this sacred fishery.

Throughout their traditional territory, the Pauquachin First Nation have travel routes and burial, cultural, heritage, and spiritual sites, as well as traditional knowledge which bears evidence of the long residency of the W̱SÁNEĆ people. Pauquachin First Nation have reported that these sites are vulnerable to disturbance. Pauquachin First Nation's view is that cumulative effects such as declining runs, environmental degradation and pollution, fishing regulations, and vessel wakes are barriers limiting harvest, violating Pauquachin First Nation's Douglas Treaty and Aboriginal rights and threatening Pauquachin First Nation health. Pauquachin First Nation have noted that in addition to the current polluted state of the Saanich Inlet, many Pauquachin First Nation members report inappropriate treatment by non-Aboriginals when harvesting at traditional sites due to the invisibility of harvesting rights to outsiders, regulations, and licensing.

16.4.2 PAUQUACHIN FIRST NATION INVOLVEMENT IN THE CONSULTATION PROCESS

Consultation with Indigenous Groups identified in Schedule D began in July of 2019 when EAO sent a letter to these groups inviting comments on the draft Section 13 Order, including consultation processes and opportunities. On August 6, 2019, at the request of Canada, the EAO under the Section 13 Order amended the geographic scope for the assessment of the marine shipping route and added the Indigenous groups identified in Schedule D which included Pauquachin First Nation. For the review of the MSA, the EAO led Consultation Activities with Indigenous Groups in Schedule D and, as part of this work, invited Pauquachin First Nation to participate in the Marine Shipping Working Group. The EAO is of the view that it has approached consultation with Pauquachin First Nation at the deeper end of the spectrum,

with the intent to identify potential impacts and consider ways to address any potential impacts to Aboriginal Interests that were identified by Pauquachin First Nation within the MSA area.

As part of the Marine Shipping Working Group, the EAO invited Pauquachin First Nation to review and provide comments on TJLP's MSA Supplemental Analysis, the EAO's draft Assessment Report (including Part C of the Assessment Report), the draft CPD, draft Certificate Conditions and recommended KMMs under CEAA 2012. As part of the Marine Shipping Working Group, Pauquachin First Nation was invited to participate in Marine Shipping Working Group meetings during the MSA Supplemental Analysis Review stages. Pauquachin First Nation participated in Marine Shipping Working Group meetings.

During the MSA review, Pauquachin First Nation submitted feedback on TJLP's MSA Supplemental Analysis, including concerns that the MSA should be scoped to 200 nm, about inappropriate use of information from the RBT2 process, insufficient assessment of impacts due to LNG carrier spill or accident, and that cumulative impacts of development on the health of the ocean ecosystems should be included in the assessment. Pauquachin First Nation also requested that the MSA should include new studies to understand impacts to Pauquachin First Nation's rights and that TJLP should be required to invest into the long-term health of the ocean. Further information related to concerns raised by Indigenous Group's with respect to scoping of the MSA and reliance on information from RBT2 and TMX processes is provided in Section 13.2 of this Report.

During the MSA review, the EAO met directly with Pauquachin First Nation to discuss TMJ, EA process, and any potential concerns with TMJ. Pauquachin First Nation met separately with TJLP in relation to TMJ. The EAO considered Pauquachin First Nation's feedback provided on the MSA and the EAO endeavoured to reflect Pauquachin Nation's concerns and perspectives related to potential impacts to Pauquachin First Nation's Aboriginal Interests due to TMJ and the consultation process in Part C of the Assessment Report.

On July 27, 2022, Pauquachin First Nation sent a letter advising the EAO that, based on commitments made by TJLP, Pauquachin First Nation consents to the granting of any authorizations or permits necessary for TMJ. Based on the letter, the EAO understands that Pauquachin First Nation consider consultation for TMJ has been fulfilled, and that Pauquachin First Nation will continue to participate in the EA and other regulatory processes in a manner that is consistent with its consent for TMJ and does not take the position that the Crown's duty to consult and accommodate has not been met. The EAO included Pauquachin First Nation's letter of consent in the referral package for decision makers at time of referral.

16.4.3 POTENTIAL IMPACTS TO TREATY RIGHTS AND OTHER INTERESTS

The following sections focus on potential impacts of TMJ to Pauquachin First Nation's Douglas Treaty rights to hunt and fish and other interests. A discussion of the EAO's assessment approach is provided in Impact Assessment Methods of Part C (Section 12.2).

The EAO considered information available, including from public sources as well as relevant issues raised by Pauquachin First Nation and members during the EA process, in the following assessments of the potential impacts of TMJ to Pauquachin First Nation's Douglas Treaty rights and other interests, mitigations and accommodations to address potential impacts.

The following sections focus on potential impacts of TMJ to Pauquachin First Nation's Douglas Treaty right to fish and hunt and other interests, mitigations, and accommodations to address potential impacts.

A. POTENTIAL IMPACTS ON FISHING

The EAO evaluated the potential effects of TMJ on Aboriginal fishing rights and provided a summary in Section 13.3.1 of this Report. In addition, the EAO considered relevant information related to the potential shipping-related effects based on review of RBT2 and TMX processes. The EAO is satisfied that the key impacts to biophysical components resulting in changes to fish quantity and quality, changes in access to fishing resources, and changes to social, cultural, and spiritual values associate with traditional fishing activities that apply to Pauquachin First Nation are summarized in Section 13.3.1.

The MSA, reporting from information in the traditional marine resource use study for TMX, noted that Pauquachin First Nation still harvest seaweed at Saanich Inlet as well as on James Island and Discovery Island, in Haro Strait, west of the shipping lanes. Pauquachin First Nation harvests clam in Coles Bay (often daily), and on the Southern Gulf Islands (e.g., Pender Island). Pauquachin harvest mussels and fish for salmon, halibut, and cod at a variety of locations near the Gulf Islands and on islands in the USA.

Pauquachin First Nation raised the following concerns regarding potential impacts on the right to fish due to TMJ:

- Concern regarding the potential cumulative impact of TMJ on steelhead, chinook and SRKWs, in relation to land and resources for traditional purposes.
    - As discussed in Section 13.3.1, the EAO is recommending KMMs under CEAA 2012 for the Fish Mitigations to Reduce Harm and Mortality, Fish Habitat Offset Plan, and Vessel Traffic Management Plan to address these concerns. The EAO did not predict any residual effects to fish and fish habitat in the MSA area.

The EAO understands that during the EAs of RBT2 and TMX, Pauquachin First Nation raised issues and concerns with potential impacts related to fishing, including that shipping may impact Pauquachin First Nation's ability to exercise Aboriginal and Treaty Harvesting rights, efforts to revive a historical reef net fishery and result in potential damage to fishing vessels or gear.

- As described in the section on Land and Marine Use Part B (Section 8.2), the EAO predicts that infrequent and short duration TMJ-related traffic disruptions would have potential to result in negligible to low magnitude effect to Indigenous access to fishing areas; and
- TJLP has stated that TMJ's influence on TMJ-related vessel operations would be limited beyond TMJ's marine terminal area (including the location and operation of international shipping lanes), but TJLP has committed to a Marine Communication Plan out to 12 nm that would be developed in consultation with Schedule B and D Indigenous Groups and include a communication procedure to inform Indigenous Groups of vessel schedules and provide a complaint submission process.

In consideration of the available information, the EAO's consultation with Pauquachin First Nation, TJLP's commitments, and the EAO's proposed EAC conditions if an EAC is issued and the recommended KMMs under CEAA 2012, TMJ is expected to result in **negligible-to-minor** impact on Pauquachin First Nation's right to fish. The EAO considers TMJ-related increases to vessel traffic during operations would be incremental compared to existing baseline conditions in the Traffic Separation Scheme of the Salish Sea.

The key factors that were considered in support of EAO's conclusion on the impacts to the right to fish are summarized as follows:

Biophysical:

- The EAO's conclusions in the Fish and Fish Habitat chapter in Part B do not predict any residual effects to fish and fish habitat in the MSA area; and
- The MSA area is a heavily utilized marine environment.

Geospatial:

- Pauquachin First Nation harvests marine invertebrates and fishes throughout the MSA area including in areas near to, or requiring crossing of, the shipping lanes;
- The EAO considers TMJ would result in an incremental increase (i.e., 0.2 – 1.1 % for segments A – D) in vessel traffic when compared to baseline conditions in the Traffic Separation Scheme of the Salish Sea; and

- The EAO's conclusions in the Current Use of Part B that TMJ-related vessel transits during operations (minimum 30 years) would result in negligible to low magnitude effects due to relatively infrequent and short-duration interruptions to access to areas in the Salish Sea.

Social, Cultural and Experiential:

- Potential negligible to low impacts due to incremental increases from TMJ-related vessel traffic during operations affecting visual quality, noise, and vessel wake (with an increasing magnitude of effect the closer one is to the vessels); and
- Potential concerns regarding safety of small vessels with large vessels and wake effects Accidents and Malfunctions and Effects of the Environment, as assessed in the section in Part B.

Mitigations:

- Proposed mitigations for impacts to Pauquachin First Nation's right to fish include the Marine Communications Plan recommended as a KMM under CEAA 2012.

B. POTENTIAL IMPACTS ON HUNTING, TRAPPING AND GATHERING

The EAO evaluated the potential effects on hunting, trapping, and gathering activities attributable to TMJ which apply broadly to Indigenous Groups. These potential effects are summarized in Section 13.3.2. The EAO is satisfied that the key impacts to biophysical components resulting in changes to wildlife and vegetation quantity and quality, changes in access to hunting, trapping and gathering areas, and changes to social, cultural, and spiritual values associated with traditional hunting, trapping and gathering activities that apply to Pauquachin First Nation are summarized in Section 13.3.2.

Conclusion

In consideration of the available information in Section 13.3.2, which outlines the potential effect to hunting, trapping and gathering; consultation with Pauquachin First Nation; Pauquachin First Nation's engagement with TJLP; TJLP's commitments; and the EAO's proposed EAC conditions if an EAC is issued and the recommended KMMs under CEAA 2012, TMJ is expected to result in **negligible** impact on Pauquachin First Nation's hunting, trapping and gathering. Based on the study used for TMX, the MSA reported that Pauquachin First Nation hunts ducks at Coles Bay; surf scoter on the beach in East Saanich and within Saanich Inlet from dugout canoe. Pauquachin First Nation gather seagull eggs from Mandarte Island (in Haro Strait, near the shipping lanes). The MSA noted that Pauquachin First Nation reported impacts to hunting from restrictions and regulations relating to licensing and other factors.

The key factors that were considered in support of EAO's conclusion on the impacts to the hunting, trapping, and gathering included the EAO's conclusions on adverse residual effects to wildlife in the MSA area predict negligible to low magnitude mortality of select marine bird species. The EAO also considered that in the MSA area, operations (30 years in duration) may cause infrequent, short-term, temporary disruptions to marine-based hunting along the proposed LNG vessel route and negligible effects on Indigenous access to terrestrially based hunting, trapping, and gathering sites that are accessed by boat from the pilot station at Sand Heads to the 12 nm territorial limit.

To mitigate potential impacts to Pauquachin First Nation's right to hunt, trap and gather, the EAO is recommending a KMM under CEAA 2012 for a Marine Communication Plan, including procedures to inform Indigenous Groups of traffic schedules and for Indigenous Groups to submit any feedback on potential adverse effects on navigation as a result of TMJ. The EAO also considered that the small relative increase due to TMJ-related vessel traffic would have a negligible effect to experiential aspects of hunting, trapping, and gathering from changes to visual quality and noise in the MSA and that all TMJ related vessels would adhere to the Marine Regulations and Legislation regulating vessel noise and lighting.

C. POTENTIAL IMPACTS ON OTHER TRADITIONAL AND CULTURAL INTERESTS

The EAO evaluated the potential for TMJ-related residual and cumulative effects to impact other traditional and cultural interests of Indigenous Groups in the MSA, as summarized in Section 13.3.3. In its evaluation, the EAO considered potential marine-shipping related effects pathways to impacts based on review of publicly available information from RBT2 and TMX processes, and any information provided by Indigenous Groups during the MSA review. The EAO is satisfied that TMJ's marine shipping-related effects in the MSA area to access, quality of experience and SRKWs would be the pathways to impacts to Pauquachin First Nation's other traditional and cultural interests.

The MSA noted, based on the study conducted during TMX, that orcas play an important cultural role in W̱SÁNEĆ culture. The MSA explained that Pauquachin First Nation used a variety of cultural travel routes in the MSA, including a route from Saanich Inlet to Stuart Island that crosses the shipping lanes, in addition to routes in proximity to the shipping lanes. During the RBT2 process Pauquachin First Nation members indicated that they travel all though the Gulf Islands for cultural practices including using a sacred bathing/cleansing site on Tumbo Island.

The MSA also noted that Pauquachin First Nation use historical canoe routes from their community through Active Pass (between Mayne Island and Galiano Island) to Point Roberts. The MSA, again referencing the TMX study, noted place names for most of the Gulf Islands and a variety of other islands in the MSA in proximity to the shipping lanes (e.g., D'arcy Island, James Island, Stuart Island – USA,– Sucia Island - USA). The MSA reported that Pauquachin First

Nation has cultural connections throughout the southern Gulf Islands and San Juan Islands, including harvesting locations, and considers these islands sacred.

Pauquachin First Nation also identified that cumulative impacts of development on the health of the ocean is a major concern, including the collapsing steelhead, chinook and SRKW populations, which Pauquachin First Nation considers are signs of an imbalance in the marine environment. Pauquachin First Nation requested that TJLP contribute to supporting the long-term recovery and health of the ocean, such as enhanced tug escorts for LNG carriers or additional investments in government spill response capacity.

- The EAO acknowledges Pauquachin First Nation's concerns regarding cumulative impacts to the health of the ocean, including potential effects to fish and SRKWs and the entire ecosystem;
- See Section 13.3.3 for a detailed discussion of the analysis and resolution of concerns related to the effects on whales. As discussed in Section 13.3.3, the EAO concluded that TMJ would not result in significant residual effects to Marine Mammals; however, the EAO notes that the current baseline of cumulative effects to SRKWs are already high and that TMJ would contribute additional residual effects from shipping noise and potential avoidance behaviour by SRKWs to ships, such that cumulative effects to SRKWs are considered significant;
- TJLP stated their commitment to adhering to the mitigation measures outlined in the MSA and that TJLP adaptive management of mitigation measures would be an essential part of the overall management strategy to promote ocean health. TJLP also stated they have included a requirement that management measures related to SRKWs would be reviewed on an annual basis to determine if changes need to be incorporated into TMJ shipping practices. TJLP also anticipates that tug escorts would be required for LNG vessels in Boundary Pass and Haro Strait; and
- The EAO is recommending as a KMM under CEAA 2012 a Vessel Traffic Management Plan that would require TJLP to incorporate contractual measures to support participation of TMJ-related vessels in the VFPA-led ECHO Program seasonal slowdown initiatives (or future equivalent), and annual reporting on TJLP's participation in regional environmental management measures and cumulative effects monitoring to protect SRKW, where feasible. The seasonal slowdown initiatives currently request vessels to slow down in key SRKW foraging areas such as Swiftsure Banks, Haro Strait and Boundary Pass. The EAO notes several regional initiatives and measures have been implemented by the Government of Canada to better understand and manage cumulative effects on the recovery of SRKWs (listed in Section 13.1.1).

During the MSA review, Pauquachin First Nation raised concerns about potential environmental effects from an accident or malfunction, resulting in a spill in the waterways of Pauquachin First Nation's traditional territory and that the Accidents and Malfunctions risk assessment in the MSA failed to provide rationale for the bunker fuel estimate and was limited by assessing a spill at only one location and at one time of year.

- In the Accidents and Malfunctions and Effects of the Environment section in Part B, with consideration of the MSA, it was determined that the risk of an LNG or bunker fuel release would have consequence severities ranging from moderate to very high with the very high being on SRKWs and heritage resources and having potentially irreversible effects. However, the likelihood was estimated to be extremely rare as the release would need to occur in the vicinity of these susceptible sites or SRKWs;
- TJLP clarified that the lower volume estimate for bunker fuel spill assessment did not affect the MSA, which was conservatively based on the oil spill modelling results performed for TMX, and the modelling results from RBT2 and TMX were qualitatively expanded for the MSA area, which included seasonal variation; and
- Marine shipping associated with TMJ would be required to meet the international standards and Canadian regulations set out by Canada's compliance-based marine safety and security system, which is designed to protect life, property, and the marine environment. The EAO is recommending a KMM under CEAA 2012 for a Marine Shipping Emergency Response Outreach Program to facilitate the integration of plans for responding to incidents in transit into existing emergency response systems, primarily the CCG's Incident Integrated Response Plans.

Additional issues and concerns with potential impacts related to traditional and cultural interests were raised by Pauquachin First Nation during the EAs of RBT2 and TMX. These concerns were not raised by Pauquachin First Nation during the TMJ EA but the EAO considers them applicable to the MSA area:

- Concerned about the impact of accidents or malfunctions on the ability to engage in traditional ceremonies due to impacted water quality or shorelines.
    - As described in the Accidents and Malfunctions Section of this Report the MSA predicted that TMJ would have moderate residual risk of LNG or bunker fuel release causing SRKWs mortality or irreversible damage to heritage resources, which were considered to result in high severity of consequences. However, the likelihood of such an event occurring was estimated to be extremely rare as the release would need to occur in the vicinity of a SRKWs or heritage resources.
    - Marine shipping associated with TMJ would be required to meet the

international standards and Canadian regulations set out by Canada's compliance-based marine safety and security system, which is designed to protect life, property, and the marine environment.

- The EAO is recommending a KMM under CEAA 2012 for a Marine Shipping Emergency Response Outreach Program to facilitate the integration of plans for responding to incidents in transit into existing emergency response systems, primarily the CCG's Incident Integrated Response Plans.

Conclusion

The EAO predicts the TMJ-related marine shipping effects alone would have **negligible-to-minor** impacts on Pauquachin First Nation's other cultural and traditional interests, although the EAO acknowledges that there is uncertainty in the relationship between incremental increases in shipping and the availability of cultural resources such as SRKW. However, in consideration of the available information in Section 13.2.3, consultation with Pauquachin First Nation, Pauquachin First Nation's engagement with TJLP, TJLP's commitments, the EAO's proposed EAC conditions if an EAC is issued, and the recommended KMMs under CEAA 2012, TMJ-related marine shipping effects combined with cumulative effects in the MSA area is expected to result in **moderate-to-serious** impact to Pauquachin First Nation's other traditional and cultural interests. The EAO's conclusions of significant cumulative effects to SRKW was a major key factor considered in the EAO's seriousness determination. The EAO notes several regional initiatives and measures have been implemented by the Government of Canada to better understand and manage cumulative effects on the recovery of SRKWs (listed in Section 13.1.1).

The key factors that were considered in support of EAO's conclusion on the impacts to other traditional and cultural interests are summarized as follows:

Cultural and Heritage Resources:

- The EAO's conclusions in Part B did not predict residual effects on Heritage Resources (7.1) from erosion due to wake effects along the shorelines of the MSA area;
- The EAO's conclusions in Part B section on Marine Mammals, which found low to moderate magnitude residual on SRKWs and significant cumulative effects to SRKWs due to underwater noise; and
- The MSA area is a heavily utilized marine environment.

Geospatial:

- Pauquachin Nation travel all though the Gulf Islands and into the USA for cultural

practices including using a sacred bathing/cleansing site on Tumbo Island. Some sites require crossing of the shipping lanes; and

- The EAO considers TMJ would result in an incremental increase (i.e., 0.2 – 1.1 % for segments A – D) to vessel traffic when compared to baseline conditions in the Traffic Separation Scheme that would result in negligible to low magnitude effects due to relatively infrequent and short-duration interruptions to access to areas in the Salish Sea.

Social, Cultural, Experiential:

- Potential negligible to low impacts due to incremental increases from TMJ-related vessel traffic during operations affecting visual quality, noise, and vessel wake (with an increasing magnitude of effect the closer one is to the vessels);
- Potential concerns regarding safety of small vessels with large vessels and wake effects Accidents and Malfunctions and Effects of the Environment, as assessed in the section in Part B; and
- SRKWs plays an important role in Pauquachin First Nation culture.

Mitigations:

- Proposed mitigations for potential impacts to traditional and cultural interests are the recommended key mitigations under CEAA 2012 for Marine Communications and Vessel Traffic Management Plans, and a Marine Shipping Emergency Response Outreach Program; and
- The EAO is recommending as KMMs under CEAA 2012 for a Vessel Traffic Management Plan that would require TJLP to incorporate contractual measures to support participation of TMJ-related vessels in the VFPA-led ECHO Program seasonal slowdown initiatives (as amended) or a future equivalent, and annual reporting on TJLP's participation in regional environmental management measures and cumulative effects monitoring to protect SRKW, where feasible. The seasonal slowdown initiatives currently request vessels to slow down in key SRKW foraging areas such as Swiftsure Banks, Haro Strait and Boundary Pass.

16.5 ESQUIMALT FIRST NATION

16.5.1 COMMUNITY PROFILE

The traditional territory of Esquimalt First Nation encompasses the lands and waters of Greater Victoria and the western side of San Juan Island. Esquimalt is part of the larger Coast Salish cultural group which has occupied the Strait of Georgia continuously for thousands of years. Ethnohistoric evidence indicates there is no distinction between the territory of the Esquimalt and Songhees peoples.

As of November 2021, Esquimalt First Nation has a registered population of 330, with 165 living on the Esquimalt reserve, 136 living off-reserve, and 29 living on other reserves[371]. Esquimalt First Nation originates from the Lək̓ʷəŋən (*Lekwungun*) Tribes who inhabited their same traditional territory. Esquimalt First Nation speak *Lekwungun* which is considered part of the Northern Straits Salish language family. The Esquimalt are "ocean people," and rely on balanced ocean ecosystems for their health and economy. Esquimalt First Nation has used and occupied its traditional lands and waters since time immemorial for hunting, fishing, transport, trade, ceremonies, and settlement; this territory and these practices continue to be integral to Esquimalt's distinctive culture and way of life.

Esquimalt First Nation has Douglas Treaty Rights to hunt over unoccupied lands and carry on their fisheries "as formerly.".

Esquimalt Harbour is a hunting and fishing area for the community. Species are harvested for sustenance, ceremonial, and commercial purposes. Esquimalt First Nation traditionally harvested aquatic plants but no longer does so due to contamination concerns. Bivalves were harvested along the southern and eastern shoreline of Vancouver Island and in the Saanich Inlet. Clams, especially littleneck and butter clams, are one of the most important food sources for Esquimalt First Nation. Crab, mussels, rock stickers (chitons), octopus, sea urchin, abalone, and geoduck are other species harvested by the Esquimalt. Sea lions were traditionally harvested for food from fishing canoes; the whole animal was used for various purposes. Humpback whales and orcas were hunted in the past; the Esquimalt relationship with SRKWs remains important to their culture and identity. Ducks, especially the surf scoter or "black

[371] Indigenous and Northern Affairs Canada. 2021. First Nation Profiles – Esquimalt First Nation, https://fnp-ppn.aadnc-aandc.gc.ca/fnp/Main/Search/FNRegPopulation.aspx?BAND_NUMBER=644&lang=eng, accessed December 16, 2021.

duck," were once very common in Esquimalt First Nation's diet. Currently, Esquimalt First Nation engages in game hunting for deer and elk in the winter.

Fish are critical for Esquimalt First Nation culture and well-being and remain a primary food source for the Esquimalt Nation. Salmon, halibut, lingcod and lingcod roe, and herring were harvested at many locations, including at Esquimalt Harbour and Race Rocks. Macaulay Point in Esquimalt Harbour is the only reported *Lekwungen sxwalu* (reef net) location on the Canadian side of the Strait of Juan de Fuca, with the rest located around San Juan Island. Reef netting was key to the Northern Straits Salish economy, and used by *Lekwungen* for fishing sockeye and pink (humpback) salmon specifically. Gaffing for chum, chinook, and coho continues at Goldstream in the fall. Esquimalt First Nation smoke their fish, a skill learned from family and neighbouring communities.

Esquimalt First Nation reported that diminishing availability, access restrictions, and avoidance due to contamination limit Esquimalt harvest, and that according to Esquimalt First Nation this violates their harvesting rights. For example, clams must be cleaned prior to consumption, and Esquimalt First Nation are forced to travel further from their home to harvest. While present use levels do not reflect past use, Esquimalt First Nation Aboriginal and treaty rights are not dependent on current use and marine resources and rights to these resource areas remain equally important to the Esquimalt First Nation. Esquimalt First Nation desires to restore marine resource use to past levels and locations. Historically Esquimalt First Nation citizens fished throughout their territory and wish to restore fishing by their members, including around the Shipping lanes.

Coastal practices and areas such as ritual bathing, religious and burial sites, longhouses, and cave and rock art sites are culturally important for Esquimalt First Nation.

Canoes were the traditional mode of transport for the Esquimalt First Nation, which required knowledge of currents and tides. Boats are still the community's main mode of transport.

Esquimalt First Nation has on- and off-reserve economic interests; those tied to their marine territory include potential property development, an RV park, marina, and float home village, bridge installation, and a dredging and pile driving business.

16.5.2 ESQUIMALT FIRST NATION INVOLVEMENT IN THE CONSULTATION PROCESS

Consultation with Indigenous Groups identified in Schedule D began in July of 2019 when EAO sent a letter to these groups inviting comments on the draft Section 13 Order, including consultation processes and opportunities. On August 6, 2019, at the request of Canada, the EAO under the Section 13 Order amended the geographic scope for the assessment of the

marine shipping route and added the Indigenous Groups identified in Schedule D which included Esquimalt First Nation. For the review of the MSA, the EAO led consultation activities with the Indigenous groups identified in Schedule D and, as part of this work, invited Esquimalt First Nation to participate in the Marine Shipping Working Group.

During the MSA review, the EAO invited Esquimalt First Nation to review and provide comments on TJLP's MSA Supplemental Analysis, the EAO's draft Assessment Report (including Part C of the Assessment Report), the draft CPD draft Certificate Conditions, and recommended KMMs under CEAA 2012. As part of the Marine Shipping Working Group, Esquimalt First Nation was invited to participate in Marine Shipping Working Group meetings during the MSA Supplemental Analysis review stages.

During the MSA review, Esquimalt First Nation submitted feedback on TJLP's MSA Supplemental Analysis, including concerns that the MSA should be scoped to 200 nm, about inappropriate use of information from the RBT2 process, insufficient assessment of impacts due to LNG carrier spill or accident, and that cumulative impacts of development on the health of the ocean ecosystems should be included in the assessment. Esquimalt First Nation also requested that the MSA should include new studies to understand impacts to Esquimalt First Nation's rights and that TJLP should be required to invest into the long-term health of the ocean. Further information related to concerns raised by Indigenous Group's with respect to scoping of the MSA and reliance on information from RBT2 and TMX processes is provided in Section 13.2.2 of this Report.

With respect to TJLP's original Application scenario, the EAO also understands that Esquimalt First Nation considered that upstream GHG emissions should have been included in the EAO's conclusions on GHG management and that the no baseline case for upstream GHG emissions was unfounded given the uncertain economic viability of shipping that volume of LNG via truck and ISO container. The EAO appreciates that Esquimalt First Nation is concerned about the cumulative effects of GHG emissions from marine shipping and is of the view that any increase in GHG emissions from a major project such as TMJ is significant, given the current GHG emission levels and their resulting impact on climate change. With respect to TJLP's BVSA Report, the EAO understands that Esquimalt First Nation requires more information to determine its perspective on the EAO's conclusions on the significance for cumulative effects of GHG management for TMJ.

The issue of direct GHG emissions from TMJ, and upstream GHG emissions – in addition to mitigations for direct emissions from TMJ – are addressed in the GHG management chapter in Section 5.2 of Part B of this Report. The EAO is proposing a Condition 20: GHG Reduction Plan, which would require measures for TJLP to reduce GHGs, including development of triggers that would cause TJLP to take corrective action to reduce GHGs, and describe how TMJ would

achieve any municipal, provincial, national, or international government GHG regulations or objectives that are made mandatory for TMJ. The EAO has reflected Esquimalt First Nation's perspectives on the EAO's assessment of GHG management for TMJ in Section 13.2.3 of Part C.

The EAO met directly with Esquimalt First Nation in January 2020 to discuss TMJ, EA process, and any potential concerns with TMJ. Teleconference meetings with Esquimalt First Nation's legal representative were conducted at their discretion and when requested. Esquimalt First Nation met separately with TJLP in relation to TMJ. Esquimalt First Nation told the EAO that a finding of residual effects should trigger a consent seeking process with Esquimalt regarding proposed mitigation and accommodation measures to ensure culture continuity and a role for Esquimalt First Nation in the future economy of the West Coast.

During review of TJLP's BVSA Report, Esquimalt First Nation representative participated in four Working Group meetings and raised concerns related to the increased bunker vessel traffic, including potential effects to the distribution of vessels in the MSA Area, and marine species that utilize the Fraser River watershed, which are important to its culture or to which it has harvesting rights, including SRKWs and salmon, respectively. The EAO considered and responded to Esquimalt First Nation's feedback provided on the MSA and the EAO endeavoured to reflect Esquimalt Nation's concerns and perspectives related to the potential for impacts to Esquimalt First Nation's Aboriginal Interests due to TMJ and the consultation process in Part C of the Assessment Report.

On July 29, 2022, Esquimalt First Nation sent a letter advising the EAO that, based on commitments made by TJLP, Esquimalt Nation consents to the granting of any authorizations or permits necessary for TMJ. Based on the letter, the EAO understands that Esquimalt Nation consider consultation for TMJ has been fulfilled, and that Esquimalt Nation will continue to participate in the EA and other regulatory processes in a manner that is consistent with its consent for TMJ and does not take the position that the Crown's duty to consult and accommodate has not been met. The EAO included Esquimalt Nation's letter of consent in the referral package for decision makers at time of referral.

16.5.3 POTENTIAL IMPACTS TO TREATY RIGHTS AND OTHER INTERESTS

The following sections focus on potential impacts of TMJ to Esquimalt First Nation Douglas Treaty rights to hunt and fish and other interests. A discussion of the EAO's assessment approach is provided in Impact Assessment Methods of Part C (Section 12.2).

The EAO considered information available, including from public sources as well as relevant issues raised by Esquimalt First Nation and members during the EA process (in meetings, letters, and correspondence), in the following assessments of the potential impacts of TMJ on

Esquimalt First Nation Douglas Treaty rights and other interests, mitigations accommodations to address potential impacts.

The following sections focus on potential impacts of TMJ to Esquimalt First Nation Douglas Treaty right to fish and hunt and other interests, mitigations, and accommodations to address potential impacts.

A. POTENTIAL IMPACTS ON FISHING

The EAO evaluated the potential effects of TMJ on Aboriginal fishing rights and provided a summary in Section 13.3.1. In addition, the EAO considered relevant information related to the potential shipping-related effects based on review of the RBT2 and TMX processes. The EAO is satisfied that the key impacts to biophysical components resulting in changes to fish quantity and quality, changes in access to fishing resources, and changes to social, cultural, and spiritual values associate with traditional fishing activities that apply to Esquimalt First Nation are summarized in Section 13.3.1.

Esquimalt First Nation raised the following concerns regarding potential impacts on the right to fish due to TMJ:

- Concern regarding the potential cumulative impact of TMJ on steelhead, chinook and SRKWs, in relation to land and resources for traditional purposes.
- Concern about the cumulative effects of marine shipping on fish and fish habitat, including effects to fish habitat due to piles, dredging, vibrodensification and scour protection at marine terminal area and changes in fish behaviour due to underwater noise during construction or mortality to sturgeon due to vessel strikes. The EAO understands that Esquimalt First Nation disagreed with the EAO's conclusions on the significance for cumulative effects to fish and fish habitat for TMJ.
- Concerns about the cumulative effects of the marine shipping on Esquimalt First Nation's rights, interests, culture and wellbeing. Esquimalt First Nation view any impact to their rights, interests and culture due to a marine shipping as significant, given the volume of existing and proposed future vessel traffic through their territorial waters.
    - As discussed in Section 13.3.1, the EAO is recommending KMMs under CEAA 2012 for the Fish Mitigations to Reduce Harm and Mortality, Fish Habitat Offset Plan, and Marine Communication Plan to address these concerns. The EAO did not predict any residual effects to fish and fish habitat in the MSA area. As described in Section 13.1.1, there are current regional Government of Canada programs and initiatives relevant to cumulative impacts to the ability of Indigenous Groups to safely access fishing areas.

Additional issues and concerns with potential impacts related to fishing were raised by Esquimalt First Nation during the EAs of RBT2 and TMX. These concerns were not raised by Esquimalt First Nation during the TMJ EA but the EAO considers them applicable to the MSA area.

- Concern about the localized impact of construction and marine shipping on Fraser River salmon and other fish stocks. These are critically important for the entire marine ecosystem and to the Esquimalt people's culture, health, and wellbeing.
    - See Section 13.3.1 for a detailed discussion of the analysis and resolution of concerns related to the effects of TMJ on fishing rights. As discussed in that section, the proposed mitigation measures to addresses this concern are included in the fish and fish habitat monitoring and mitigation plans.
- Concerns regarding impact of potential spill restricting times and locations, reducing quality/quantity of marine resources, harvesting gear. All of these concerns were in relation to the exercising of fishing rights.
    - In the Accidents and Malfunctions and Effects of the Environment section in Part B, it was determined that with the mitigation measures in place, including navigational requirements, vessel operational procedures, emergency response measures and emergency spill response that would be supported by TC and/or other federal authorities as applicable, these concerns would be addressed.
- Concern regarding shipping lane overlap with areas where Esquimalt First Nation holds Aboriginal and Treaty Harvesting Rights and that TMJ-related ships may impact these Rights by restricting time and locations and disrupting travel ways.
    - In the Current Use section of Part B of this Report it was determined that with the marine transportation regulatory regime, as well as low frequency and short duration of TMJ-related traffic there would be negligible to low magnitude of effect of Indigenous access to fishing areas in Esquimalt First Nations traditional territories.

The EAO considers that the safety of small vessels with large vessels and wake effects were assessed in the Accidents and Malfunctions Section of Part B and that the regular and relatively short-duration passage of TMJ-related vessels through the Salish Sea would include monitoring of compliance with maritime regulations and legislation such as the *Canada Shipping Act* and the Collision Regulations. TJLP has stated that TMJ's influence on TMJ-related vessel operations would be limited beyond TMJ's marine terminal area, but TJLP has committed to a Marine Communication Plan out to 12 nm that would be developed in consultation with Schedule B and D Indigenous Groups and include a communication procedure to inform Indigenous Groups

of vessel schedules and provide a complaint submission process. TJLP has also committed to developing a Marine Shipping Emergency Response Outreach Program that would facilitate the integration of plans for responding to incidents in transit into existing emergency response systems, primarily the CCG's Incident Integrated Response Plans.

Conclusion

In consideration of the available information; the EAO's consultation with Esquimalt First Nation; Esquimalt First Nation's engagement with TJLP; TJLP's commitments; and the EAO's proposed EAC conditions if an EAC is issued and the recommended KMMs under CEAA 2012, TMJ is expected to result in **negligible-to-minor** impact on Esquimalt First Nation's right to fish. The EAO considers TMJ-related increases to vessel traffic during operations would be incremental compared to existing baseline conditions in the Traffic Separation Scheme of the Salish Sea. The EAO considers that TMJ-related marine shipping effects combined with cumulative effects in the MSA area could potentially result in more serious impacts to Esquimalt First Nation's right to fish, should Esquimalt First Nation begin to fish regularly in and around the shipping lanes because TMJ-related shipping during operations would interact with current baseline levels of cumulative effects to access to fishing areas and the experience of fishing in, or adjacent to, the shipping lanes.

The EAO considered Esquimalt First Nation's perspectives on cumulative effects and Esquimalt First Nation's ability to meaningfully practice their fishing rights in the MSA area. The EAO acknowledges that there are already vessels transiting the shipping lanes which can impact Indigenous fishers' access to and quality of experience of fishing. While the EAO recognizes there is some uncertainty when considering how cumulative effects impact Aboriginal Interests, the EAO agrees with Esquimalt First Nation, that any increase in vessel traffic in the shipping lanes would potentially be more serious when combined with past, present, and reasonably foreseeable shipping activities. The EAO understands that Esquimalt First Nation disagrees with the EAO's significance determination on the fishing component of Current Use of Lands and Resources for Traditional Purposes in Part B of this report, and that Esquimalt First Nation told the EAO that their Aboriginal Interests are not dependent on current use.

The key factors that were considered in support of the EAO's conclusion on the impacts to the right to fish are summarized as follows:

Biophysical:

- The EAO's conclusions in the Fish and Fish Habitat chapter in Part B which do not predict any residual effects to fish and fish habitat in the MSA area;
- Esquimalt First Nation view any impact to their rights, interests and culture due to a marine shipping as significant, given the volume of existing and proposed future vessel

traffic through their territorial waters; and

- The MSA area is a heavily utilized marine environment.

Geospatial:

- Esquimalt Harbour and Race Rocks are important fishing areas for Esquimalt First Nation but historically Esquimalt First Nation fished throughout their territory and wish to restore fishing by their members, including around the shipping lanes;
- The EAO considers TMJ would result in an incremental increase (i.e., 0.2 – 1.1 % for segments A – D) in vessel traffic when compared to baseline conditions in the Traffic Separation Scheme of the Salish Sea; and
- The EAO's conclusions in the Current Use of Part B that TMJ-related vessel transits during operations (minimum 30 years) would result in negligible to low magnitude effects of relatively infrequent and short duration interruptions to access to areas in the Salish Sea.

Social, Cultural and Experiential:

- Potential negligible to low impacts due to incremental increases from TMJ-related vessel traffic during operations affecting visual quality, noise, and vessel wake (with an increasing magnitude of effect the closer one is to the vessels); and
- Potential concerns regarding safety of small vessels with large vessels and wake effects Accidents and Malfunctions and Effects of the Environment, as assessed in the section in Part B.

Mitigations/Accommodations:

- Proposed mitigations for impacts to Esquimalt First Nation's right to fish include the Marine Communications Plan recommended as KMMs under CEAA 2012.
- Esquimalt Nation has agreed to a bilateral Mutual Benefits Agreement with TJLP as fulfilment of consultation for TMJ.

B. POTENTIAL IMPACTS ON HUNTING, TRAPPING AND GATHERING

The EAO evaluated the potential effects on hunting, trapping, and gathering activities attributable to TMJ in Section 13.3.2 which apply broadly to Indigenous Groups. The EAO is satisfied that the key impacts to biophysical components resulting in changes to wildlife and vegetation quantity and quality, changes in access to hunting, trapping and gathering areas, and changes to social, cultural, and spiritual values associated with traditional hunting, trapping and gathering activities that apply to Esquimalt First Nation are summarized in Section 13.3.2.

Conclusion

In consideration of the available information in Section 13.3.2, which outlines the potential effect to hunting, trapping and gathering; consultation with Esquimalt First Nation; Esquimalt First Nation's engagement with TJLP; TJLP's commitments; and the EAO's proposed EAC conditions if an EAC is issued and the recommended KMMs under CEAA 2012, TMJ is expected to result in **negligible** impact on Esquimalt First Nation's right to hunt, trap and gather.

The key factors that were considered in support of the EAO's conclusion on the impacts to hunting, trapping, and gathering included the EAO's conclusions on adverse residual effects to wildlife in the MSA area predict negligible to low magnitude mortality of select marine bird species. The EAO also considered that in the MSA area, operations (30 years in duration) may cause infrequent, short-term, temporary disruptions to marine-based hunting along the proposed LNG vessel route and negligible effects on Indigenous access to terrestrially based hunting, trapping, and gathering sites that are accessed by boat from the pilot station at Sand Heads to the 12 nm territorial limit. The EAO understands that Esquimalt First Nation agrees with the EAO's residual effects assessment for marine birds but are uncertain about the EAO's non-significance determination for the potential effects to migratory and marine birds from TMJ.

To mitigate potential impacts to Esquimalt First Nation's right to hunt, trap and gather, the EAO is recommending a KMM under CEAA 2012 for a Marine Communication Plan, including procedures to inform Indigenous Groups of traffic schedules and for Indigenous Groups to submit any feedback on potential adverse effects on navigation as a result of TMJ. The EAO also considered that the small relative increase due to TMJ-related vessel traffic would have a negligible effect to experiential aspects of hunting, trapping, and gathering from changes to visual quality and noise in the MSA and that all TMJ related vessels would adhere to the Marine Regulations and Legislation regulating vessel noise and lighting. The EAO also considered that the small relative increase due to TMJ-related vessel traffic would have a negligible effect to experiential aspects of hunting, trapping, and gathering from changes to visual quality and noise in the MSA and that all TMJ related vessels would adhere to the Marine Regulations and Legislation regulating vessel noise and lighting.

C. POTENTIAL IMPACTS ON OTHER TRADITIONAL AND CULTURAL INTERESTS

The EAO evaluated the potential for TMJ-related residual and cumulative effects to impact other traditional and cultural interests of Indigenous Groups in the MSA, as summarized in Section 13.3.3. In its evaluation, the EAO considered potential marine-shipping related effects pathways to impacts based on review of publicly available information from RBT2 and TMX processes, and any information provided by Indigenous Groups during the MSA review. The EAO is satisfied that TMJ's marine shipping-related effects in the MSA area to access, quality of

experience and SRKWs would be the pathways to impacts to Esquimalt First Nation's other traditional and cultural interests.

Esquimalt First Nation raised the following concerns regarding potential impacts related to traditional and cultural interests due to TMJ:

Esquimalt First Nation identified that cumulative impacts of development on the health of the ocean is a major concern, including the collapsing steelhead, chinook and SRKW populations, which Esquimalt First Nation considers are signs of an imbalance in the marine environment. Esquimalt First Nation expressed concerned about the cumulative effects of the marine shipping industry on SRKWs, including that vessel strikes and harm to prey should also be identified as a pathway for residual effects. Esquimalt First Nation requested that TJLP contribute to supporting the long-term recovery and health of the ocean, such as enhanced tug escorts for LNG carriers or additional investments in government spill response capacity.

- The EAO acknowledges Esquimalt First Nation's concerns regarding cumulative impacts to the health of the ocean, including potential effects to fish and SRKWs and the entire ecosystem. The EAO understands that Esquimalt First Nations disagrees with the EAO's significance determination for residual effects to SRKWs for TMJ.;
- See Section 13.3.3 for a detailed discussion of the analysis and resolution of concerns related to the effects on whales. As discussed in Section 13.3.3, the EAO concluded that TMJ would not result in significant residual effects to Marine Mammals; however, the EAO notes that the current baseline of cumulative effects to SRKWs are already high and that TMJ would contribute additional residual effects from shipping noise and potential avoidance behaviour by SRKWs to ships, such that cumulative effects to SRKWs are considered significant;
- TJLP stated their commitment to adhering to the mitigation measures outlined in the MSA and that TJLP adaptive management of mitigation measures would be an essential part of the overall management strategy to promote ocean health. TJLP also stated they have included a requirement that management measures related to SRKWs would be reviewed on an annual basis to determine if changes need to be incorporated into TMJ shipping practices. TJLP also anticipates that tug escorts would be required for LNG vessels in Boundary Pass and Haro Strait; and
- The EAO is recommending as a KMM under CEAA 2012 a Vessel Traffic Management Plan that would require TJLP to incorporate contractual measures to support participation of TMJ-related vessels in the VFPA-led ECHO Program seasonal slowdown initiatives (or future equivalent), and annual reporting on TJLP's participation in regional environmental management measures and cumulative effects monitoring to protect SRKW, where feasible. The seasonal slowdown initiatives currently request vessels to

slow down in key SRKW foraging areas such as Swiftsure Banks, Haro Strait and Boundary Pass. The EAO notes several regional initiatives and measures have been implemented by the Government of Canada to better understand and manage cumulative effects on the recovery of SRKWs (listed in Section 13.1.1).

- During the MSA review, Esquimalt First Nation raised concerns about potential environmental effects from an accident or malfunction, resulting in a spill in the waterways of Esquimalt First Nation's traditional territory and that the Accidents and Malfunctions risk assessment in the MSA failed to provide rationale for the bunker fuel estimate and was limited by assessing a spill at only one location and at one time of year. In the Accidents and Malfunctions and Effects of the Environment section in Part B, with consideration of the MSA, it was determined that the risk of an LNG or bunker fuel release would have consequence severities ranging from moderate to very high with the very high being on SRKWs and heritage resources and having potentially irreversible effects. However, the likelihood was estimated to be extremely rare as the release would need to occur in the vicinity of these susceptible sites or SRKWs;
- TJLP clarified that the lower volume estimate for bunker fuel spill assessment did not affect the MSA, which was conservatively based on the oil spill modelling results performed for TMX, and the modelling results from RBT2 and TMX were qualitatively expanded for the MSA area, which included seasonal variation; and
- Marine shipping associated with TMJ would be required to meet the international standards and Canadian regulations set out by Canada's compliance-based marine safety and security system, which is designed to protect life, property, and the marine environment. The EAO is recommending a KMM under CEAA 2012 for a Marine Shipping Emergency Response Outreach Program to facilitate the integration of plans for responding to incidents in transit into existing emergency response systems, primarily the CCG's Incident Integrated Response Plans.

Regarding Indigenous socio-economic conditions and Indigenous health and wellbeing, the EAO understands that Esquimalt First Nation agrees with the EAO's residual effects assessment but disagrees with the EAO's significance determination of not significant for TMJ. The EAO understands that Esquimalt First Nation are concerned about the cumulative effects of the marine shipping industry on their well-being. According to Esquimalt First Nation, there are signs of an already declining marine ecosystem, a shifting economy on the West Coast are a concern, and that further consensus seeking for appropriate mitigation and accommodation measures would be necessary to ensure Esquimalt First Nation's cultural continuity and role for in the future economy of the West Coast.

- In Part B, Land and Marine Resource Use (Section 8.2) and Current Use of Lands and Resources for Traditional Purposes (Section 11.4), the EAO concludes that TMJ-related vessel movements would result in negligible to low impacts to commercial fishing, including commercial harvesting areas in the MSA RSA. The EAO also predicted that residual effects to the experience of commercial and non-commercial marine users conducting their activities are expected to diminish with increased distance from TMJ vessels in transit and are predicted to be negligible in magnitude. The EAO is recommending a KMM under CEAA 2012 for a Marine Communication Plan out to 12 nm that would be developed in consultation with Indigenous Groups, including Esquimalt First Nation, and include a communication procedure and complaint submission process. As described in the Fish and Fish Habitat chapter in Part B, the EAO did not conclude any residual or cumulative effects to fish and fish habitat for the MSA.

Additional issues and concerns with potential impacts related to traditional and cultural interests were raised by Esquimalt First Nation during the EAs of RBT2 and TMX. These concerns were not raised by Esquimalt First Nation during the TMJ EA but the EAO considers them applicable to the MSA area.

- Concern that members' lack of access to traditional harvesting areas is removing opportunities to teach children how to fish and harvest (transmission of traditional knowledge). Concern about impacts of ships, transiting through territorial waters, including close proximity to D'Arcy Island which has cultural meaning to Esquimalt First Nation
    - In the Current Use section of Part B of this Report the EAO predicted that the increased vessel traffic due to TMJ-related vessel transits during operations (minimum 30 years) would result in negligible to low magnitude effects due to relatively infrequent and short-duration interruptions to access to areas for resource harvesting for cultural purposes and visual quality, noise, and vessel wake (with an increasing magnitude of effect the closer one is to the vessels).
    - The EAO acknowledges that wakes generated by TMJ vessels would be larger the closer one is to the vessel and that the presence of LNG carriers may be considered disturbing for safety or other reasons by Indigenous people, which could lead to reduced opportunities to practice Aboriginal rights in and around the shipping lanes.
    - The EAO is recommending a KMM under CEAA 201 for a Marine Communication Plan out to 12 nm that would be developed in consultation with Schedule B and

D Indigenous Groups and include a communication procedure and complaint submission process.

- Concerns regarding impact of potential spill impacting burial sites, archaeological remains and cultural/spiritual sites and restricting ability to engage in traditional ceremonies.
    - In the Accidents and Malfunctions and Effects of the Environment section of Part B, with consideration of the MSA, it was determined that the risk of an LNG or bunker fuel release would have consequence severities ranging from moderate to very high with the very high having potentially irreversible effects to heritage resources. However, the likelihood was estimated to be extremely rare as the release need to occur in the vicinity of areas for used for cultural purposes.
    - The EAO is recommending a Marine Shipping Emergency Response Outreach Program that would facilitate the integration of plans for responding to incidents in transit into existing emergency response systems, primarily the CCG's Incident Integrated Response Plans and marine shipping associated with TMJ would be required to meet the international standards and Canadian regulations set out by Canada's compliance-based marine safety and security system, which is designed to protect life, property, and the marine environment

Conclusion

The EAO predicts the TMJ-related marine shipping effects alone would have **negligible-to-minor** impacts on Esquimalt First Nation's other cultural and traditional interests, although the EAO acknowledges that there is uncertainty in the relationship between incremental increases in shipping and the availability of cultural resources, such as SRKW. However, in consideration of the available information, the EAO's consultation with Esquimalt First Nation, Esquimalt First Nation's engagement with TJLP, TJLP's commitments and the EAO's proposed EAC conditions if an EAC is issued, and the recommended KMMs under CEAA 2012, the impacts from TMJ combined with cumulative effects in the MSA area is expected to result in **moderate-to-serious** impacts on Esquimalt First Nation's other traditional and cultural interests. The EAO's conclusions of significant cumulative effects to SRKW was a major key factor considered in the EAO's seriousness determination. The EAO notes several regional initiatives and measures have been implemented by the Government of Canada to better understand and manage cumulative effects on the recovery of SRKWs (listed in Section 13.1.1).

The key factors that were considered in support of EAO's conclusion on the impacts to other traditional and cultural interests are summarized as follows:

Cultural and Heritage Resources:

- The EAO's conclusions in the Heritage Resources section of Part B did not predict residual effects on Heritage Resources (Section 7.1) from erosion due to wake effects along the shorelines of the MSA area;
- The EAO's conclusions in Part B section on Marine Mammals, which found low to moderate magnitude residual effects from TMJ-related vessels on SRKWs and significant cumulative effects to SRKWs due to underwater noise; and
- The MSA area is a heavily utilized marine environment.

Geospatial:

- Esquimalt First Nation's access and travel through territorial waters, such as D'Arcy Island which has cultural meaning, for example; and
- The EAO considers TMJ would result in an incremental increase (i.e., 0.2 – 1.1 % for segments A – D) to vessel traffic when compared to baseline conditions in the Traffic Separation Scheme of the Salish Sea would result in negligible to low magnitude effects due to relatively infrequent and short-duration interruptions to access to areas in the Salish Sea.

Social, Cultural, Experiential:

- Potential negligible to low impacts due to incremental increases from TMJ-related vessel traffic during operations affecting visual quality, noise and vessel wake (with an increasing magnitude of effect the closer one is to the vessels);
- Potential concerns regarding safety of small vessels with large vessels and wake effects Accidents and Malfunctions and Effects of the Environment, as assessed in the section in Part B;
- Access and use of traditional harvesting areas important for opportunities to teach children how to fish and harvest (transmission of traditional knowledge); and
- SRKWs are important to Esquimalt First Nation culture and identity.

Mitigations/Accommodations:

- Proposed mitigations for potential impacts to traditional and cultural interests are the recommended key mitigations under CEAA 2012 for a Marine Communications, and Vessel Traffic Management Plans, and a Marine Shipping Emergency Response Outreach

Program; and

- The EAO is recommending as KMMs under CEAA 2012 for a Vessel Traffic Management Plan that would require TJLP to incorporate contractual measures to support participation of TMJ-related vessels in the VFPA-led ECHO Program seasonal slowdown initiatives (as amended) or a future equivalent, and annual reporting on TJLP's participation in regional environmental management measures and cumulative effects monitoring to protect SRKW, where feasible. The seasonal slowdown initiatives currently request vessels to slow down in key SRKW foraging areas such as Swiftsure Banks, Haro Strait and Boundary Pass.
- Esquimalt Nation has agreed to a bilateral Mutual Benefits Agreement with TJLP as fulfilment of consultation for TMJ.

16.6 TSAWOUT FIRST NATION

16.6.1 COMMUNITY PROFILE

SȾÁUTW̱ (Tsawout) First Nation is one of the Indigenous Groups that constitute the W̱SÁNEĆ (Saanich) people, which are a Malahat Nation Coast Salish cultural group of people that has occupied the Strait of Georgia continuously for thousands of years. Tsawout First Nation is located on the Saanich Peninsula on Vancouver Island and has six reserves; East Saanich 2 is the main reserve. As of November 2021, Tsawout First Nation has a registered population of 973 people with 553 living on Tsawout First Nation reserves, 312 living off-reserve, and 108 living on other reserves[372].

SȾÁUTW̱ (Tsawout) means "houses on the hill," describing the settlement as seen from canoes approaching in Saanichton Bay. The Tsawout have lived here for many centuries, and Tsawout creation stories recount islands and fisheries as their ancestors. Before contact, the W̱SÁNEĆ Nations were a single group of extended families sharing the SENĆOŦEN language and a cultural order revolving around their relations with marine creatures, spirit beings, and one another. The relationship of the W̱SÁNEĆ with their marine environment drives their society, economy, culture, and identity.

[372] Indigenous and Northern Affairs Canada. 2021. First Nation Profiles – Tsawout First Nation, https://fnp-ppn.aadnc-aandc.gc.ca/fnp/Main/Search/FNRegPopulation.aspx?BAND_NUMBER=654&lang=eng, accessed December 16, 2021.

Before contact, the W̱SÁNEĆ Nations were a single group of extended families sharing the SENĆOŦEN language and a cultural order revolving around their relations with marine creatures, spirit beings, and one another. The relationship of the W̱SÁNEĆ with their marine environment drives their society, economy, culture, and identity. WSANETS (Saanich Peninsula) is the "homebase" of the W̱SÁNEĆ. It derives its name from the image presented to paddlers in a canoe as they approach from the water, meaning "raised up" or "emerging people." The naming practice based on the perspective of the water reveals the fundamental nature of marine territory to the W̱SÁNEĆ worldview.

W̱SÁNEĆ families had permanent winter settlements on the Saanich Peninsula and temporary settlements throughout the San Juan and southern Gulf Islands and across the Salish Sea to Point Roberts and Boundary Bay. This territory is defined by the pursuit of the five salmon species and steelhead and is where the W̱SÁNEĆ have continuous and exclusive use and occupation since time immemorial. The 1987 Saanich Declaration describes W̱SÁNEĆ territory as "[encompassing] all [their] Spiritual Places, medicine and fruit gathering places, fishing stations, hunting and trapping areas, winter and summer homesites, burial sites, meditation places and all our territories in between these places." W̱SÁNEĆ families exploited different ecological niches, had tailored seasonal movements, and shared resources with each other. The W̱SÁNEĆ reciprocal system of sharing marine resources and associated knowledge is key to self-actualization and creating an autonomous future. The W̱SÁNEĆ had reef net fishing sites throughout their territory, with the Nation's largest reef net claim at Point Roberts and another on ŚNEWIŁ (the Fraser River).

The W̱SÁNEĆ view themselves as equal to and inseparable from the natural environment, entailing deep respect for and spiritual connection to salmon, the earth, and each other. One ritual the W̱SÁNEĆ practiced demonstrating respect was to release some salmon to ensure they could return home and allow their lineages to continue. Salmon were also relatives as all living things were once people and should be respected as such.

The W̱SÁNEĆ signed the Douglas Treaty (1852) during an apparent time of escalating tension between the W̱SÁNEĆ and white settlers due to logging disputes and the shooting of a First Nation boy by a white farmer. The W̱SÁNEĆ therefore viewed the treaty as a peaceful agreement between two nations that would ensure the continuation of the W̱SÁNEĆ fisheries, lifestyle, culture, resource management, and governance systems as formerly. By the mid-19th century, most W̱SÁNEĆ families had relocated to Saanichton Bay due to disease spread by European contact, raids from northern First Nations, and land pre-emptions by white settlers; former sites were continually occupied during seasonal rounds.

Tsawout First Nation has Douglas Treaty Rights to hunt over unoccupied lands and carry on their fisheries "as formerly." Tsawout First Nation also asserts that it holds Aboriginal rights and title within its territory. Shipping traffic transits through Tsawout First Nation territorial waters and in close proximity to Tsawout First Nation reserves. Tsawout First Nation uses the Salish Sea to hunt, fish, gather, travel, and harvest; harvest varies based on the season and traditional W̱SÁNEĆ calendar. Marine foods are preferred for the Tsawout First Nation diet and health, consumed weekly to daily; as the W̱SÁNEĆ say, "when the tide is out, the table is set." Some W̱SÁNEĆ earn a living and feed their communities through fishing. Active Tsawout First Nation "superharvesters" gather marine resources to share in networks and at regular community events, religious and spiritual gatherings, funerals, longhouse events, naming ceremonies, and potlatches. This is how Tsawout First Nation maintains its subsistence economy and cultural identity. Resources are even shared with neighbouring Salish communities.

The Coast Salish are sometimes called the "salmon people" due to heavy reliance on salmon for seasonal rounds and cultural practices. Unlike other Coast Salish peoples, the W̱SÁNEĆ did not have major rivers within their territory, so fished for salmon in the sea through their unique reef net method and were thus called the "saltwater people." ŦEKI (sockeye) is the most prized species of the Coast Salish, including for the W̱SÁNEĆ. Reef net fishing is a way of life as well as part of the W̱SÁNEĆ identity. According to W̱SÁNEĆ teachings, the reef net technique was gifted from the Salmon People to the W̱SÁNEĆ in exchange for a beautiful W̱SÁNEĆ princess, allowing the W̱SÁNEĆ to live in harmony with salmon forever. Reef netting plays a central role in W̱SÁNEĆ cosmology, seasonal round, and societal organization, and demonstrates the continual use of salmon by the W̱SÁNEĆ since time immemorial. Reef net fisheries are sacred and Tsawout First Nation are working to revive them. Tsawout First Nation reported harvesting all five salmon species at hundreds of locations that line the shipping lanes of the MSA including the waters around Tumbo Island, Saturna Island, Pender Island, Sidney Island, James Island, D'Arcy islands, Coal Island and Saanichton Bay to Port Renfrew. Tsawout First Nation report using their travel routes seasonally to access fishing, gathering, and hunting locations. Herring and herring roe were traditionally harvested in the area but at lower levels now due to frequent ship traffic.

In addition to salmon, currently marine invertebrate harvesting plays a significant role in feeding the community. Crab and sea urchin have been used since time immemorial, and Tsawout First Nation also manages a communal prawn licence and red sea urchin licence. Cumulative effects such as declining runs, environmental degradation, fishing regulations, and vessel wakes are described as barriers limiting Tsawout First Nation harvest, who view it as violating their Douglas Treaty and Aboriginal rights. Tsawout reported travelling outward towards the shipping lanes to find clean beaches to harvest bivalves such as clams and mussels.

W̱SÁNEĆ continue to gather seaweed and hunt deer and ducks on islands near the shipping lanes. The surf scoter is prized by the W̱SÁNEĆ for sacred ceremonial use. Other ducks are served at funerals, longhouse ceremonies, and community events. Preferred seaweed, crab, octopus and marine invertebrate gathering locations have been identified along the shoreline adjacent to or within the shipping lanes among the Gulf Islands (some Islands in Washington State), the shoreline at Saanichton Bay and the northern tip of the Saanich Peninsula.

Tsawout First Nation identified Point Roberts within the MSA as the location of the Saanich people's most important village site and associate reef-net sites. Tsawout First Nation would like to continue the use of this area, but they have been forced out over time. Other sites of cultural importance within the MSA include a village site in Tod Inlet, burial sites on Pender Island, Scull Island, Saturna Island and Cabbage Island.

16.6.2 TSAWOUT FIRST NATION INVOLVEMENT IN THE CONSULTATION PROCESS

Consultation with Indigenous groups identified in Schedule D began in July of 2019 when EAO sent a letter to these groups inviting comments on the draft Section 13 Order, including consultation processes and opportunities. On August 6, 2019, at the request of Canada, the EAO under the Section 13 Order amended the geographic scope for the assessment of the marine shipping route and added the Indigenous groups identified in Schedule D which included the Tsawout First Nation. For the review of the MSA, the EAO led consultation activities with the Indigenous groups identified in Schedule D and, as part of this work, invited Tsawout First Nation to participate in the Marine Shipping Working Group. The EAO is of the view that it has approached consultation with Tsawout First Nation at the deeper end of the spectrum, with the intent to identify potential impacts and consider ways to address any potential impacts to Aboriginal Interests that were identified by Tsawout First Nation within in the MSA area.

During the MSA review, the EAO invited Tsawout First Nation to review and provide comments on TJLP's MSA Supplemental Analysis, the EAO's draft Assessment Report (including Part C of the Assessment Report), the draft CPD and draft Certificate Conditions. As part of the Marine Shipping Working Group, Tsawout First Nation was invited to participate in Marine Shipping Working Group meetings during the MSA Supplemental Analysis, and BVSA Report Review stages. During review of TJLP's BVSA Report, Tsawout First Nation attended four Working Group meetings. The EAO offered to meet directly with Tsawout First Nation to discuss TMJ, the EA process, and any potential concerns with TMJ.

16.6.3 POTENTIAL IMPACTS TO TREATY RIGHTS AND ABORIGINAL INTERESTS

The following sections focus on potential impacts of the Project to Tsawout First Nation's Douglas Treaty rights to hunt and fish and other interests. A discussion of the EAO's assessment approach is provided in Impact Assessment Methods of Part C (Section 12.2).

The EAO considered information available, including from public sources as well as relevant issues raised by Tsawout First Nation and members during the EA process, in the following assessments of the potential impacts of TMJ to Tsawout First Nation's Douglas Treaty rights and other interests, mitigations and accommodations to address potential impacts.

A. POTENTIAL IMPACTS ON FISHING

The EAO evaluated the potential effects of TMJ on Aboriginal fishing rights and provided a summary in Section 13.3.1. In addition, the EAO considered relevant information related to potential shipping-related effects based on review of RBT2 and TMX processes. The EAO is satisfied that the key impacts to biophysical components resulting in changes to fish quantity and quality, changes in access to fishing resources, and changes to social, cultural, and spiritual values associated with traditional fishing activities that apply to Tsawout First Nation are summarized in Section 13.3.1

The MSA included information on a variety of marine invertebrate harvesting and fishing locations throughout the Gulf Islands and on some Islands in Washington State – many of which are in proximity to the shipping lanes and some requiring crossing the lanes to access the sites. Fishing was also reported at many locations along the marine shipping lanes in segments A and B of the MSA area.

Additional issues and concerns with potential impacts related to fishing were raised by Tsawout First Nation during the RBT2 Panel and TMX EA processes. These concerns were not raised by Tsawout First Nation during the TMJ EA but the EAO considers them applicable to the MSA area.

- Concerned about impacts to fishing and fishing rights. Tsawout First Nation exercise FSC fishing rights as well as having a commercial fishery interest
    - See Section 13.3.1 for a detailed discussion of the analysis and resolution of concerns related to the effects of TMJ on fishing. As discussed in Section 13.3.1, the proposed mitigation measures to addresses this concern are included in the fish and fish habitat monitoring and mitigation, marine communications and vessel traffic management plans.
- Concerned with the increase in vessel traffic and the impacts on the salmon migration route

  - See Section 13.3.1 for a detailed discussion of the analysis and resolution of concerns related to the effects of increase in vessel traffic on fish. As discussed in Section 13.3.1, the proposed mitigation measures to addresses this concern are included in the fish and fish habitat monitoring and mitigation, marine communications and vessel traffic management plans.

- Concern regarding the impact of invasive species, illegal dumping and anchorage contributing to environmental impacts to fish and crab habitat
  - The EAO notes that the potential introduction of invasive species from ballast water discharge would be sufficiently managed through adherence to federal regulations (*Canada Shipping Act*, 2001) and international conventions (for example, MARPOL Convention) that prohibit these activities in the Fraser River and MSA area.
  - See Section 13.3.1 for a detailed discussion of the analysis and resolution of concerns related to these effects on environmental impacts to habitats. As discussed in Section 13.3.1, the proposed mitigation measures to address this concern are included in the fish and fish habitat monitoring and mitigation plan.
  - As described in the Accidents and Malfunctions and Effects of the Environment section (Section 9) of Part B, vessels would be required to meet internationally recognized safety standards that include pollution prevention of ships.
- Concerns regarding impact of increasing shipping traffic on reef net fishing, as fishing areas the near shipping lanes. Tsawout First Nation is working to revive the reef net fishery.
  - As outlined in the Current Use assessment in Part B, potential negligible to low magnitude impacts to the experiential aspect of fishing in the MSA due to TMJ-related vessel traffic and potential concerns regarding safety regularly occurring vessels transits during the operations for Indigenous Groups who harvest fish in, or in proximity to, the navigational channel or shipping lanes, or those who need to cross these areas to access fishing resources.
  - TJLP has stated that TMJ's influence on TMJ-related vessel operations would be limited beyond TMJ's marine terminal area, but TJLP has committed a Marine Communication Plan out to 12 nm that would be developed in consultation with Schedule B and D Indigenous Groups and include procedures to inform Indigenous Groups of traffic schedules, for Indigenous Groups to provide feedback on adverse effects related to navigation as a result of TMJ, and for TJLP to document and respond to feedback in a timely manner.

- The EAO also acknowledges that the TMJ-specific mitigation measures would not reduce impacts to quality of experience because some Indigenous people may find the presence and sounds of LNG carriers disturbing for safety and/or aesthetic reasons, or for other reasons.

- Impact to small fishing boats, increasing the risk to fishers and diminishing the ability to gather marine food.
  - With respect to likelihood of collision between large and smaller ships, TJLP responded to a similar concern raised during TMJ and respect to mitigation measures, including loudhailers (such as, megaphone) and vessel operators being required by TMJ to follow their own emergency response plans that meet or exceed TMJ's safety standard, that that the environmental consequence severity of a small vessel collision would be moderate with rare likelihood. The residual risk level was estimated to be moderate.
  - In section the Current Use section of Part B, it was determined that with the marine transportation regulatory regime, as well as low frequency and short duration of TMJ-related traffic there would be negligible to low magnitude of effect of Indigenous access to fishing areas.
  - The EAO is recommending a KMM under CEAA 2012 for a Marine Communication Plan out to 12 nm with procedures to inform Indigenous Groups of traffic schedules, for Indigenous Groups to provide feedback on adverse effects related to navigation as a result of TMJ, and for TJLP to document and respond to feedback in a timely manner.

- Concerns regarding the cumulative effects of increased shipping traffic on traditional crabbing as the vessel wake can be dangerous to those harvesting crab on the shore and vessel wake limiting ability to bring children out to experience reef net fishing
  - It was determined that the TMJ-related vessel wake would be within natural variation of the wave heights in this area (see the EAO's section on Vessel Wake in Part B) and the EAO is of the opinion that TMJ-related vessel wakes from Sand Heads to the 12 nm territorial limit would have a negligible effect on the ability of Indigenous fishers to access and undertake fishing activities (see the Current Use section (Section 11.4) in Part B).
  - The EAO acknowledges that Indigenous people may find the presence and sounds of LNG carriers disturbing for safety and/or aesthetic reasons, or for other reasons and that shipping-related access interruptions and concerns about safety could then lead to reduced opportunities for cultural transmission,

including Indigenous language acquisition by younger generations while undertaking traditional harvesting activities on land or on the water, and in particular, while fishing.

- In the Current Use of Land and Resources for Traditional Purposes section (Section 11.4) of Part B the EAO predicted that TMJ-related traffic would have negligible to low magnitude of effects to Indigenous access to fishing areas due to relatively infrequent and short-duration interruptions to access.

Conclusion

In consideration of the available information, the EAO's consultation with Tsawout First Nation, TJLP's commitments, the EAO's proposed EAC conditions if an EAC is issued and the recommended KMMs under CEAA 2012, TMJ is expected to result in **negligible-to-minor** impact on Tsawout First Nation's right to fish. The EAO considers TMJ-related increases to vessel traffic during operations would be incremental compared to existing baseline conditions in the Traffic Separation Scheme of the Salish Sea.

The key factors that were considered in support of EAO's conclusion on the impacts to the right to fish are summarized as follows:

Biophysical:

- The EAO's conclusions in the Fish and Fish Habitat section in Part B which do not predict any residual effects to fish and fish habitat in the MSA area; and
- The MSA area is a heavily utilized marine environment.

Geospatial:

- Tsawout First Nation harvests marine invertebrates and fishes throughout the MSA area including in areas near to, or requiring crossing of, the shipping lanes;
- The EAO considers TMJ would result in an incremental increase (i.e., 0.2 – 1.1 percent for segments A – D) in vessel traffic when compared to baseline conditions in the Traffic Separation Scheme of the Salish Sea; and
- The EAO's conclusions in the Current Use of Part B that TMJ-related vessel transits during operations (minimum 30 years) would result in negligible to low magnitude effects due to relatively infrequent and short-duration interruptions to access to areas in the Salish Sea.

Social, Cultural and Experiential:

- Potential negligible to low impacts due to incremental increases from TMJ-related vessel traffic during operations affecting visual quality, noise, and vessel wake (with an

increasing magnitude of effect the closer one is to the vessels);

- Safety and wake related concerns about marine shipping are limiting Tsawout First Nation's ability to bring children out to experience reef net fishing, which could impact intergenerational knowledge transfer; and
- Reef net fisheries are sacred, and Tsawout First Nation are working to revive them.

Mitigations:

- Proposed mitigations for impacts to Tsawout First Nation's right to fish include the Marine Communications Plan recommended as KMMs under CEAA 2012.

B. POTENTIAL IMPACTS ON HUNTING, TRAPPING AND GATHERING

The EAO evaluated the potential effects on hunting, trapping and gathering rights attributable to TMJ in Section 13.3.2 above that apply broadly to Indigenous Groups. The EAO is satisfied that the key impacts to biophysical components resulting in changes to wildlife and vegetation quantity and quality, changes in access to hunting, trapping and gathering areas, and changes to social, cultural, and spiritual values associated with traditional hunting, trapping and gathering activities that apply to Tsawout First Nation are summarized in Section 13.3.2.

The MSA reported that Tsawout First Nation's preferred marine birds harvested for traditional purposes were ducks and geese. Duck hunting currently occurs in the area around Sidney and James Islands, from Saanichton Bay south to Cordova Bay and sites next to the shipping lanes on the south side of Saturna Island and south and west of South Pender Island.

Conclusion

In consideration of the available information in Section 13.3.2, the EAO's consultation with Tsawout First Nation, TJLP's commitments, the EAO's proposed EAC conditions if an EAC is issued and the recommended KMMs under CEAA 2012, TMJ is expected to result in **negligible** impact on Tsawout First Nation's right to hunt, trap and gather.

The key factors that were considered in support of the EAO's conclusion on the impacts to the right to hunt, trap and gather included the EAO's conclusions on adverse residual effects to wildlife in the MSA area predict negligible to low magnitude mortality of select marine bird species. The EAO also considered that in the MSA area, operations (30 years in duration) may cause infrequent, short-term, temporary disruptions to marine-based hunting along the proposed LNG vessel route and negligible effects on Indigenous access to terrestrially based hunting, trapping, and gathering sites that are accessed by boat from the pilot station at Sand Heads to the 12 nm territorial limit.

To mitigate potential impacts to Tsawout First Nation's right to hunt, trap and gather, the EAO is recommending a KMM under CEAA 2012 for a Marine Communication Plan, including procedures to inform Indigenous Groups of traffic schedules and for Indigenous Groups to submit any feedback on potential adverse effects on navigation as a result of TMJ. The EAO also considered that the small relative increase due to TMJ-related vessel traffic would have a negligible effect to experiential aspects of hunting, trapping, and gathering from changes to visual quality and noise in the MSA and that all TMJ related vessels would adhere to the Marine Regulations and Legislation regulating vessel noise and lighting.

C. POTENTIAL IMPACTS ON OTHER TRADITIONAL AND CULTURAL INTERESTS

The EAO evaluated the potential for TMJ-related residual and cumulative effects to impact other traditional and cultural interests of Indigenous Groups in the MSA, as summarized in Section 13.3.3. In its evaluation, the EAO considered potential marine-shipping related effects pathways to impacts based on review of publicly available information from RBT2 and TMX processes, and any information provided by Indigenous Groups during the MSA review. The EAO is satisfied that TMJ's marine shipping-related effects in the MSA area to access, quality of experience and SRKWs would be the pathways to impacts to Tsawout First Nation's other cultural and traditional interests.

The MSA reported that orcas are a key species in oral history, providing a sense of place and well-being. It also explained that traditional travel routes are used seasonally to access fishing, gathering, and hunting locations. These routes can intersect with the shipping lanes. The MSA noted that Point Roberts was the most important village site and reef-net site, but Tsawout First Nation no longer use it. Additional important sites in the MSA area are a first village site in Tod inlet, burial sites on Pender, Scull, Saturna and Cabbage Islands and summer camps throughout the Gulf Islands and Henry Island (USA).

Additional issues and concerns with potential impacts related to traditional and cultural interests were raised by Tsawout First Nation during the EAs of RBT2 and TMX. These concerns were not raised by Tsawout First Nation during the TMJ EA but the EAO considers them applicable to the MSA area:

- Concerned with the potential for vessel strikes to whales, and the impacts of increased underwater noise.
    - See in Section 13.3.3 for a detailed discussion of the analysis and resolution of concerns related to the effects on whales. As discussed in that section, the EAO concluded that TMJ would not result in significant residual effects to Marine Mammals; however, the EAO notes that the current baseline of cumulative effects to SRKWs are already high and that TMJ would contribute additional

residual effects from shipping noise and potential avoidance behaviour by SRKWs to ships, such that cumulative effects to SRKWs are considered significant.

  - The EAO is recommending a KMM under CEAA 2012 for a Vessel Traffic Management Plan that would require TJLP to incorporate contractual measures to support participation of TMJ-related vessels in the VFPA-led ECHO Program seasonal slowdown initiatives (as amended) or a future equivalent, and annual reporting on TJLP's participation in regional environmental management measures and cumulative effects monitoring to protect SRKW, where feasible. The seasonal slowdown initiatives currently request vessels to slow down in key SRKW foraging areas such as Swiftsure Banks, Haro Strait and Boundary Pass. The EAO notes several regional initiatives and measures have been implemented by the Government of Canada to better understand and manage cumulative effects on the recovery of SRKWs (listed in Section 13.1.1).

- Concerns regarding impact of wake erosion on currently unknown burial sites
  - It was determined that the TMJ-related vessel wake would be within natural variation of the wave heights in this area, as discussed in the Vessel Wake section in Part B.

Conclusion

The EAO predicts the TMJ-related marine shipping effects alone would have **negligible-to-minor** impacts on Tsawout First Nation's other cultural and traditional interests, although the EAO acknowledges that there is uncertainty in the relationship between incremental increases in shipping and the availability of cultural resources, such as SRKW. However, in consideration of the available information in in Section 13.3.3, the EAO's consultation with Tsawout First Nation, TJLP's commitments, the EAO's proposed EAC conditions if an EAC is issued and the recommended KMMs under CEAA 2012, TMJ-related marine shipping effects combined with cumulative effect in the MSA area is expected to result in **moderate-to-serious** impact on Tsawout First Nation's other traditional and cultural interests. The EAO's conclusions of significant cumulative effects to SRKW was a major key factor considered in the EAO's seriousness determination. The EAO notes several regional initiatives and measures have been implemented by the Government of Canada to better understand and manage cumulative effects on the recovery of SRKWs (listed in Section 13.1.1).

The key factors that were considered in support of the EAO's conclusion on the impacts to other traditional and cultural interests are summarized as follows:

Cultural and Heritage Resources:

- The EAO's conclusions in the Heritage Resources section of Part B did not predict residual effects on Heritage Resources (Section 7.1) from erosion due to wake effects along the shorelines of the MSA area;
- The EAO's conclusions in Part B section on Marine Mammals, which found low to moderate magnitude residual effects from TMJ-related vessels on SRKWs and significant cumulative effects to SRKWs due to underwater noise; and
- The MSA area is a heavily utilized marine environment.

Geospatial:

- The EAO considers TMJ would result in an incremental increase (i.e., 0.2 – 1.1 % for segments A – D) to vessel traffic when compared to baseline conditions in the Traffic Separation Scheme of the Salish Sea would result in negligible to low magnitude effects due to relatively infrequent and short-duration interruptions to access to areas in the Salish Sea.

Social, Cultural, Experiential:

- Potential negligible to low impacts due to incremental increases from TMJ-related vessel traffic during operations affecting visual quality, noise, and vessel wake (with an increasing magnitude of effect the closer one is to the vessels);
- Potential concerns regarding safety of small vessels with large vessels and wake effects as assessed in the Accidents and Malfunctions and Effects of the Environment section of Part B; and
- Tsawout First Nation's special cultural and spiritual relationship to SRKWs.

Mitigations:

- Proposed mitigations for potential impacts to traditional and cultural interests are the recommended key mitigations under CEAA 2012 for a Marine Communications, and Vessel Traffic Management Plans, and a Marine Shipping Emergency Response Outreach Program; and
- The EAO is recommending as KMMs under CEAA 2012 for a Vessel Traffic Management Plan that would require TJLP to incorporate contractual measures to support participation of TMJ-related vessels in the VFPA-led ECHO Program seasonal slowdown initiatives (as amended) or a future equivalent, and annual reporting on TJLP's participation in regional environmental management measures and cumulative effects monitoring to protect SRKW, where feasible. The seasonal slowdown initiatives currently request vessels to slow down in key SRKW foraging areas such as Swiftsure

Banks, Haro Strait and Boundary Pass.

16.7 T'SOU-KE (SOOKE) FIRST NATION

16.7.1 COMMUNITY PROFILE

T'Sou-ke First Nation describes themselves as a First Nation located on the southwest coast of Vancouver Island that has resided within its traditional territory since time immemorial. That territory extends beyond its reserve lands from approximately Beechey Head to the east and Port Renfrew to the west, north to the Koksilah River, and south towards the United States, including the Northern Straits (otherwise known as the Strait of Juan de Fuca) and Secretary Island ("Territory").

T'Sou-ke First Nation is part of the Te'mexw Treaty Association, along with Malahat Nation, Snaw-Naw-As (Nanoose First Nation), Songhees Nation, Scia'new (Beecher Bay) First Nation, and T'Sou-ke First Nation, which is operating within the final phases of the modern treaty process (Stage 5). Te'mexw traditional territory is located in two main areas, southern Vancouver Island in the Greater Victoria area and on the east coast of Vancouver Island around Nanoose Bay. T'Sou-ke First Nation is also part of the Naut'sa mawt Tribal Council, along with Halalt, Homalco, Klahoose First Nation, K'ómoks First Nation, Malahat Nation, Tla'amin Nation, Snaw-Naw-As (Nanoose First Nation), Stz'uminus First Nation, Tsawwassen First Nation, and Tsleil-Waututh Nation. T'Sou-ke First Nation has two reserves and, as of February 2022, has a registered population of 315 people with 125 living on own reserve, 188 living off-reserve and 2 living on other reserves[373].

The T'Sou-ke language is a distinct dialect of Northern Straits Salish, closely related to Saanich, Songhees, Samish, Lummi, and Semiahmoo. The name T'Sou-ke is derived from a Straits Salish word for a small stickleback fish that is commonly found at the mouth of the Sooke River.

T'Sou-ke First Nation note that the name "T'Sou-ke" emphasizes the connection that T'Sou-ke First Nation has to its Territory and the resources therein. It is derived from a Straits Coast Salish word for the rare and endangered stickleback fish that is found at the mouth of the Sooke River, near one of T'Sou-ke First Nation's ancestral village sites. T'Sou-ke First Nation's

[373] Indigenous and Northern Affairs Canada. 2022. First Nation Profiles – T'Sou-ke First Nation, https://fnp-ppn.aadnc-aandc.gc.ca/fnp/Main/Search/FNRegPopulation.aspx?BAND_NUMBER=657&lang=eng, accessed March 22, 2022.

Territory is of critical importance to its knowledge, use and occupancy, and the continued ability of its members to meaningfully exercise its rights. That Territory includes the marine environment, which has sustained T'Sou-ke First Nation members for generations, extending beyond providing nourishment to an intimate connection with T'Sou-ke First Nation's cultural identity. For instance, salmon is used not only for food but also for sacred seasonal ceremonies. The act of fishing has many communal aspects, bringing families together, supporting community ties, and providing the transfer of T'Sou-ke First Nation's knowledge and culture through the generations. SRKWs are also an integral part of T'Sou-ke First Nation's customs, practices, traditions, and spirituality. To T'Sou-ke First Nation, SRKWs are supernatural beings that often act as important messengers, communicating vital information that informs T'Sou-ke First Nation's stewardship of the marine environment in its Territory.

T'Sou-ke First Nation describe their Aboriginal rights as including rights to:

- harvest (fishing, hunting, trapping, and gathering) for subsistence, cultural, and economic purposes, including all manner of marine and freshwater species. For example, the five species of Pacific salmon have always been a major food source for T'Sou-ke First Nation, and play a central role in T'Sou-ke First Nation's exercises of its fishing and cultural rights;
- marine navigation and travel;
- traditional knowledge, culture, and way of life, such as maintaining areas of cultural importance like seafood and game processing areas, and burial sites. A particular sacred site of importance is the Northern Straits, which have been both a spiritual site and an important trade and travel route since time immemorial; and
- self-governance.

T'Sou-ke First Nation also note their rights under the Douglas Treaty to carry on its fisheries "as formerly" (including the rights to travel to and from that fishery), to hunt over unoccupied lands, and to have its village sites remain free from disturbance. In addition, T'Sou-ke First Nation noted their Aboriginal title to its entire Territory, including to the waters and marine foreshore areas within it.

Historically, the T'Sou-ke First Nation predominantly utilized reef nets, known as SXOLE, to catch running salmon in open water, deploying nets outside Sooke Harbour southeast from Otter Point to Becher Bay. Reef nets could catch thousands of fish a day during the peak of the summer Sockeye run and through drying and smoking, stocks of salmon could be kept for the winter period. Halibut, lingcod, herring, and rockfish were other reliable sources of food throughout the year. Marine invertebrates including crabs, mussels, sea urchins, cockles, and numerous species of clams were gathered along the shorelines at low tide. Marine hunters

used nets or harpoons to catch seals and porpoises, which were caught for their meat and oil. Harvesting of resources from the sea by fishing, gathering, and hunting is of primary importance, with each particular resource occupying a distinct time period during the yearly cycle. T'Sou-ke First Nation members see the marine and inland ecosystems as intimately connected.

The five species of migratory Pacific salmon (sockeye, Coho, chinook or spring, pink, and chum) have always been a major food source for the T'Sou-ke First Nation people and continue to play a central role in T'Sou-ke First Nation fishing practices. Sockeye are the most important species. Salmon are harvested in the Strait of Juan de Fuca and in the Sooke River. The use of reef nets has been revitalized in recent years as the technique has been shown to be an effective means of both harvesting and monitoring salmon. Salmon fishing is a notably important activity not only to get enough fish to see families through the winter, but also as a communal event where they spent time learning and interacting with their entire family.

T'Sou-ke First Nation members reported harvesting, fishing, and cultural activities in the Strait of Juan de Fuca including trapping crab, fishing for lingcod, halibut, rock cod, dogfish, herring, and five Pacific salmon species, and using fish traps. Many members report travelling to Port Renfrew annually to harvest smelt. T'Sou-ke First Nation members also report gaffing for salmon in some small rivers along the Strait. Use is especially intensive between Race Rocks and China Beach.

Along the coastal areas in the Strait of Juan de Fuca, T'Sou-ke First Nation reports: place names; a birth place; seafood processing areas; smokehouses; gathering places (for elders' gatherings, youth gatherings, picnics, seafood collecting, camping, and smelting); ceremonial places (for dances, feasts, and greeting protocols associated with Tribal Journeys); medicinal plant gathering areas; teaching places (where members learn to gather seafood, berries, and medicinal plants and traditional craft making); and spiritual places. T'Sou-ke First Nation members reported that water routes in the Strait of Juan de Fuca are used for tribal journeys, fishing trips, marine invertebrate harvesting trips and travel across the Strait of Juan de Fuca has important transportation, cultural, and teaching value. Many of the Tribal Journey canoe routes reproduce traditional travel routes used by Coast Salish ancestors for trading and attending potlatches.

Sooke Harbour and Sooke Basin comprise a very heavily used area in which many T'Sou-ke First Nation participants reported fishing for anchovies and herring in the 1980s and 1990s, ongoing fishing for salmon (chum and coho), perch, flounder, steelhead, and cutthroat trout, and setting shrimp and crab traps. The foreshore and coastal areas of Sooke harbour and Sooke Basin comprise of areas for clam harvesting (including butter clams, manila clams, littleneck clams,

and cockles), collecting oysters and mussels and raking crabs; an oyster farm that the T'Sou-ke First Nation is establishing in the basin; hunting ducks and geese; picking berries (including blackberries, blueberries, Oregon grapes, salmon berries, salal berries, thimbleberries, strawberries, and black caps), picking sweet grass; and collecting firewood.

16.7.2 T'SOU-KE FIRST NATION INVOLVEMENT IN THE CONSULTATION PROCESS

Consultation with Indigenous groups identified in Schedule D began in July of 2019 when EAO sent a letter to these groups inviting comments on the draft Section 13 Order, including consultation processes and opportunities. On August 6, 2019, at the request of Canada, the EAO under the Section 13 Order amended the geographic scope for the assessment of the marine shipping route and added the Indigenous groups identified in Schedule D which included the T'Sou-ke First Nation. For the review of the MSA, the EAO led consultation activities with the Indigenous groups identified in Schedule D and, as part of this work, invited T'Sou-ke First Nations to participate in the Marine Shipping Working Group. The EAO is of the view that it has approached consultation with T'Sou-ke First Nation at the deeper end of the spectrum, with the intent to identify potential impacts and consider ways to address any potential impacts to Aboriginal Interests that were identified by T'Sou-ke First Nation within the MSA area.

During the MSA review, EAO invited T'Sou-ke First Nation to review and provide comments on TJLP's MSA Supplemental Analysis, the EAO's draft Assessment Report (including Part C of the Assessment Report), the draft CPD, draft Certificate Conditions and recommended KMMs under CEAA 2012. As part of the Marine Shipping Working Group, T'Sou-ke First Nation was invited to participate in Marine Shipping Working Group meetings during the MSA Supplemental Analysis Review stages. The EAO offered to meet directly with T'Sou-ke First Nation to discuss TMJ, EA process, and any potential concerns with TMJ.

During the MSA review, T'Sou-ke First Nation sent two letters to the EAO that outlining T'Sou-ke First Nation's key concerns related to TMJ and the EA process. T'Sou-ke First Nation's main concerns included that the MSA should be scoped out beyond 12 nm within Canada's territorial sea as a legal requirement of CEAA 2012, proposed measures in the MSA to reduce effects from underwater noise and vessel strikes to SRKW should not be considered as mitigations since these are either voluntary, not pro-active (i.e., reporting out on strikes after they happen), or not specific to TMJ, and a new Indigenous land and resource use study would be needed to understand the potential impacts to T'Sou-ke First Nation's current use in the MSA area. The letters identified that T'Sou-ke First Nation did not give consent for the EAO to apply land and resource use information provided through RBT2 and TMX to the MSA for TMJ, and considers

this information may be incomplete (i.e., RBT2 process is still ongoing), out of date, and not applicable to impacts specific to TMJ.

During the MSA review, the EAO met directly with T'Sou-ke First Nation to discuss TMJ, EA process, and any potential concerns with TMJ. T'Sou-ke First Nation met separately with TJLP in relation to TMJ. The EAO responded to the letters and also had follow up dialogue to better understand the concerns raised in the letters sent by T'Sou-ke First Nation. The EAO considered T'Sou-Ke First Nation's feedback provided on the MSA and the EAO endeavoured to reflect T'Sou-ke First Nation's concerns and perspectives related to potential impacts to T'Sou-ke First Nation's Aboriginal Interests due to TMJ and the consultation process in Part C of the Assessment Report.

Based on these discussions the EAO understands that T'Sou-ke First Nation wants to ensure that the Assessment Report included T'Sou-ke First Nation's perspective that, in addition to the EAO's conclusions that underwater noise from TMJ-related marine shipping would have potential for significant cumulative effects on SRKW, decision makers should also consider that there could also be potential for TMJ-related marine shipping effects in critical habitat for SRKW located in Canada's EEZ beyond 12 nm. Further information related to concerns raised by Indigenous Group's with respect to scoping of the MSA and reliance on information from RBT2 and TMX processes is provided in Section 13 of this Report.

Also, through dialogue the EAO was able to explain that the Part B conclusions were not based on an assumption that the proposed mitigations for SRKW, including TJLP's participation in regional programs, would completely mitigate potential impacts from TMJ-related vessels for the same reasons that T'Sou-ke provided. The EAO understands that Indigenous Groups have a strong spiritual and cultural connection to SRKWs and that the Government of Canada will continue working with Indigenous Peoples, members of the ECHO Program, the marine industry, and other governments to adaptively manage the recovery of SRKWs. For more information about the EAO's considerations of existing regional Government of Canada initiatives please see Section 13.1.2 of this Report.

The EAO acknowledges there is some uncertainty associated with the EAO's conclusions on the overall potential seriousness of impact from TMJ (i.e., TMJ effects combined with cumulative effects) on Aboriginal Interests and Treaty Rights. The level of uncertainty in the EAO's conclusions is affected by multiple factors, including the extent of the EAO's understanding of the locations where Indigenous Groups practice their Aboriginal Interests in the MSA area, or the complex relationship between incremental increases in shipping from TMJ-related vessels and cumulative effects to Aboriginal Interests, for example. As described in the Current Use of Lands and Resources for Traditional Purposes section of Part B, the EAO found it is reasonable to expect that past effects would combine with effects from TMJ-related marine shipping to

result in significant cumulative effects to current use for fishing and other cultural use of marine areas for Indigenous Groups that preferentially use or rely on sites located at TMJ or within and adjacent to shipping lanes. Please see Section 13.2.1 for additional information related to the concerns raised by Indigenous Groups related to the EAO's reliance on publicly available information from RBT2 and TMX processes for the MSA of TMJ.

On July 28, 2022, T'Sou-ke First Nation sent a letter advising the EAO that, based on commitments made by TJLP, T'Sou-ke First Nation consents to the granting of any authorizations or permits necessary for TMJ. Based on the letter, the EAO understands that T'Sou-ke First Nation consider consultation for TMJ has been fulfilled, and that T'Sou-ke First Nation will continue to participate in the EA and other regulatory processes in a manner that is consistent with its consent for TMJ and does not take the position that the Crown's duty to consult and accommodate has not been met. The EAO included T'Sou-ke First Nation's letter of consent in the referral package for decision makers at time of referral.

16.7.3 POTENTIAL IMPACTS TO TREATY RIGHTS AND ASSERTED ABORIGINAL INTERESTS

The following sections focus on potential impacts of TMJ to T'Sou-ke First Nation's Douglas Treaty rights and asserted Aboriginal Interests. A discussion of the EAO's assessment approach is provided in Section 12.2 Impact Assessment Methods of this Report.

The EAO considered information available, including from public sources. The EAO reached out to T'Sou-ke First Nation regarding potential effects on its Douglas Treaty rights and Aboriginal Interests and received a letter outlining the T'Sou-ke First Nations perspectives on TMJ which the EAO considered in our assessment below.

The following sections focus on potential impacts of TMJ to T'Sou-ke First Nation's Douglas Treaty right and asserted Aboriginal Interests, mitigations, and accommodations to address potential impacts.

A. POTENTIAL IMPACTS ON FISHING

The EAO evaluated the potential effects on fishing rights attributable to TMJ which are summarized in Section 13.3.1. In addition, the EAO considered the potential effects based on review of the RBT2 and TMX processes. The EAO is satisfied that the key impacts to biophysical components resulting in changes to fish quantity and quality, changes in access to fishing resources, and changes to social, cultural, and spiritual values associate with traditional fishing activities that apply to T'Sou-ke First Nation are summarized in Section 13.3.1.

Additional issues and concerns with potential impacts related to fishing were raised by T'Sou-ke First Nation during the EAs of RBT2 and TMX. These concerns were not raised by T'Sou-ke First Nation during the TMJ EA but the EAO considers them applicable to the MSA area:

Cumulative effects such as declining runs, environmental degradation, fishing regulations, and vessel wakes are described as barriers limiting T'Sou-ke First Nation harvest, who view it as violating their Douglas Treaty and Aboriginal Interests. The RBT2 Panel report noted that T'Sou-ke First Nation also noted that their community was already facing curtailment of their traditional activities due to the existing shipping taking place through their territory. They stated that additional ships would hinder their members in travelling by boat in their territorial waters to reach preferred harvesting areas and culturally significant sites.

- Concern that the increase in vessel traffic associated would adversely impact salmon, halibut and other marine species by further congesting migration paths and reducing available habitat.
    - See Section 13.3.1 for detailed discussion to address this concern. As discussed in Section 13.3.1, the proposed mitigation measures to address concerns regarding impacts to these species are included in the fish and fish habitat monitoring and mitigation plan. The EAO did not predict residual impacts to fish and fish habitat in the MSA area from TMJ-related vessels.
- Concern about impacts on ability to exercise Aboriginal subsistence and commercial harvesting of clams
    - See Section 13.3.1 for a detailed discussion of the analysis and resolution of concerns related to these effects on environmental impacts to fish habitats. The EAO considered that TMJ-related marine shipping in the MSA area may cause infrequent, short-term, temporary disruptions predicted to result in negligible effects on Indigenous access to terrestrially based gathering sites that are accessed by boat from the pilot station at Sand Heads to the 12 nm territorial limit. The EAO did not predict residual impacts to fish and fish habitat, including shellfish, in the MSA area from TMJ-related vessels.
    - Marine shipping associated with TMJ would be required to meet the international standards and Canadian regulations set out by Canada's compliance-based marine safety and security system, which is designed to protect life, property, and the marine environment.

Conclusion

In consideration of the available information; the EAO's consultation with T'Sou-ke First Nation; T'Sou-ke First Nation's engagement with TJLP; TJLP's commitments; the EAO's proposed EAC

conditions if an EAC is issued and the recommended KMMs under CEAA 2012, TMJ is expected to result in **negligible-to-minor** impact on T'Sou-ke First Nation's right to fish. The EAO considers TMJ-related increases to vessel traffic during operations would be incremental compared to existing baseline conditions in the shipping lanes of the Salish Sea.

The key factors that were considered in support of the EAO's conclusion on the impacts to the right to fish are summarized as follows:

Biophysical:

- EAO's conclusions in the Fish and Fish Habitat chapter in Part B which do not predict any residual effects to fish and fish habitat in the MSA area; and
- The MSA area is a heavily utilized marine environment.

Geospatial:

- Key fishing areas for T'Sou-ke First Nation include the water routes in the Strait of Juan de Fuca, Sooke Harbour, and Sooke Basin;
- The EAO considers TMJ would result in an incremental increase (i.e., 0.2 – 1.1 % for segments A – D) in vessel traffic when compared to baseline conditions in the Traffic Separation Scheme of the Salish Sea; and
- The EAO's conclusions in the Current Use of Part B that TMJ-related vessel transits during operations (minimum 30 years) would result in negligible to low magnitude effects due to relatively infrequent and short-duration interruptions to access to areas in the Salish Sea.

Social, Cultural and Experiential:

- Potential negligible to low impacts due to incremental increases from TMJ-related vessel traffic during operations affecting visual quality, noise, and vessel wake (with an increasing magnitude of effect the closer one is to the vessels);
- Due to small number of TMJ-related vessels relative to current and projected vessel traffic these are predicted to have a negligible residual effect to experiential aspects of fishing; and
- Potential concerns regarding safety of small vessels with large vessels and wake effects Accidents and Malfunctions and Effects of the Environment, as assessed in the section in Part B.

Mitigations:

- Proposed mitigations for impacts to T'Sou-ke First Nation's right to fish include the

Marine Communications Plan recommended as a KMMs under CEAA 2012.

B. POTENTIAL IMPACTS ON HUNTING, TRAPPING AND GATHERING

The EAO evaluated the potential effects on hunting, trapping and gathering activities attributable to TMJ in Section 13.3.2 above that apply broadly to Indigenous Groups. The EAO is satisfied that the key impacts to biophysical components resulting in changes to wildlife and vegetation quantity and quality, changes in access to hunting, trapping and gathering areas, and changes to social, cultural, and spiritual values associated with traditional hunting, trapping and gathering activities that apply to T'Sou-ke First Nation are summarized in Section 13.3.2.

Additional issues and concerns with potential impacts related to hunting, trapping, and gathering were raised by T'Sou-ke First Nation during the EAs of RBT2 and TMX. These concerns were not raised by T'Sou-ke First Nation during the TMJ EA but the EAO considers them applicable to the MSA area.

- Concern that wakes occurring in increased frequency as a result of TMJ-related vessels would increase erosion and the ability of T'Sou-ke members to continue exercise their rights in foreshore areas.
    - It was determined that the TMJ-related vessel wake would be within natural variation of the wave heights in this area, see the Vessel Wake section of Part B of this Report.
    - The EAO acknowledges that wakes generated by TMJ vessels would be larger the closer one is to the vessel and that the presence of LNG carriers may be considered disturbing for safety and/or aesthetic reasons, or for other reasons.

Conclusion

In consideration of the available information, the EAO's consultation with T'Sou-ke First Nation, T'Sou-ke First Nation's engagement with TJLP, TJLP's commitments, the EAO's proposed EAC conditions if an EAC is issued and the recommended KMMs under CEAA 2012, TMJ is expected to result in **negligible** impact on T'Sou-ke First Nation's hunting, trapping, and gathering activities.

The key factors that were considered in support of the EAO's conclusion on the impacts to the hunting, trapping, and gathering included the EAO's conclusions on adverse residual effects to wildlife in the MSA area predict negligible to low magnitude mortality of select marine bird species. The EAO also considered that in the MSA area, operations (30 years in duration) may cause infrequent, short-term, temporary disruptions to marine-based hunting along the proposed LNG vessel route and negligible effects on Indigenous access to terrestrially based

hunting, trapping, and gathering sites that are accessed by boat from the pilot station at Sand Heads to the 12 nm territorial limit.

To mitigate potential impacts to T'Sou-ke First Nation's right to hunt, trap and gather, the EAO is recommending a KMM under CEAA 2012 for a Marine Communication Plan, including procedures to inform Indigenous Groups of traffic schedules and for Indigenous Groups to submit any feedback on potential adverse effects on navigation as a result of TMJ. The EAO also considered that the small relative increase due to TMJ-related vessel traffic would have a negligible effect to experiential aspects of hunting, trapping, and gathering from changes to visual quality and noise in the MSA and that all TMJ related vessels would adhere to the Marine Regulations and Legislation regulating vessel noise and lighting.

C. POTENTIAL IMPACTS ON OTHER TRADITIONAL AND CULTURAL INTERESTS

The EAO evaluated the potential for TMJ-related residual and cumulative effects to impact other traditional and cultural interests of Indigenous Groups in the MSA, as summarized in Section 13.3.3. In its evaluation, the EAO considered potential marine-shipping related effects pathways to impacts based on review of publicly available information from RBT2 and TMX processes, and any information provided by Indigenous Groups during the MSA review. The EAO is satisfied that TMJ's marine shipping-related effects in the MSA area to access, quality of experience and SRKWs would be the pathways to impacts to T'Sou-ke First Nation other traditional and cultural interests.

T'Sou-ke First Nation raised the following concerns regarding potential impacts on the traditional and cultural interests from TMJ:

- Concerned about adverse and cumulative impacts to SRKWs, including impacts to SRKWs related to critical habitat beyond the 12 nm scoping of the MSA and limitations of proposed mitigation measures noted in the MSA like the Whale Alert App or participation in regional initiatives such as the VFPA-led ECHO Program seasonal slowdown initiatives.
    - See Section 13.3.3 for a detailed discussion of the analysis and resolution of concerns related to the effects on whales. As discussed in Section 13.3.3, the EAO concluded that TMJ would not result in significant residual effects to Marine Mammals; however, the EAO notes that the current baseline of cumulative effects to SRKWs are already high and that TMJ would contribute additional residual effects from shipping noise and potential avoidance behaviour by SRKWs to ships, such that cumulative effects to SRKWs are considered significant. The EAO recommends the Vessel Traffic Management Plan as KMMs under CEAA 2012 that would require TJLP to incorporate contractual measures

to support participation of TMJ-related vessels in the VFPA-led ECHO Program seasonal slowdown initiatives (as amended) or a future equivalent, and annual reporting on TJLP's participation in regional environmental management measures and cumulative effects monitoring to protect SRKW, where feasible. The seasonal slowdown initiatives currently request vessels to slow down in key SRKW foraging areas such as Swiftsure Banks, Haro Strait and Boundary Pass. The EAO also notes several regional initiatives and measures have been implemented by the Government of Canada to better understand and manage cumulative effects on the recovery of SRKWs (listed in Section 13.1.1).

- Concerns about potential impacts from a spill of any kind.
    - In the Accidents and Malfunctions and Effects of the Environment section of Part B of this Report, with consideration of the MSA, it was determined that the risk of an LNG or bunker fuel release would have consequence severities ranging from moderate to very high with the very high having potentially irreversible effects. However, the likelihood of these spills was estimated to range from rare to extremely rare, with extremely rare being those causing SRKWs fatality or irreversible damage to heritage resources.

Additional issues and concerns with potential impacts related to traditional and cultural interests were raised by T'Sou-ke First Nation during the EAs of RBT2 and TMX. These concerns were not raised by T'Sou-ke First Nation during the TMJ EA but the EAO considers them applicable to the MSA area:

- Concern about the introduction of invasive species into waters by way of transport in ballast water, disrupting the marine and coastal ecosystem and the ability both to harvest preferred species, and to harvest preferred species in preferred locations, including in areas of cultural and spiritual significance to T'Sou-ke First Nation
    - In the Fish and Fish Habitat section and Water section of this report, the EAO notes that the potential introduction of invasive species from ballast water discharge would be sufficiently managed through adherence to federal regulations (*Canada Shipping Act*, 2001) and international conventions (for example, MARPOL Convention) that prohibit these activities in the Fraser River and MSA area.
    - See Section 13.3.1 for a detailed discussion of the analysis and resolution of concerns related to these effects on environmental impacts to habitats. As discussed in Section 13.3.1, the proposed mitigation measures to address this concern are included in the OEMP, and fish and fish habitat monitoring and mitigation plan.

- Concern that the increase in ship traffic has the potential to adversely affect and infringe on T'Sou-ke First Nations rights by hindering boat travel and disrupting access to harvesting areas and culturally significant sites. T'Sou-ke also voiced concern with proper assessment of boats and boat movements (i.e. speed).
    - The EAO notes that the RBT2 process included information about T'Sou-ke First Nation's connection to other communities on Vancouver Island and the USA through canoe journeys and how travel by canoe in the Salish Sea is integral to T'Sou-ke First Nation culture.
    - In the Current Use section of Part B of this Report it was determined that with the marine transportation regulatory regime, as well as low frequency and short duration of TMJ-related traffic there would be negligible to low magnitude of effect on Indigenous access in the MSA area. TJLP has stated that TMJ's influence on TMJ-related vessel operations would be limited beyond TMJ's marine terminal area, TJLP has committed to a Marine Communication Plan out to 12 nm that would be developed in consultation with Schedule B and D Indigenous Groups and include a communication procedure to inform Indigenous Groups of vessel schedules and provide a complaint submission process.
    - The EAO is recommending as a KMM under CEAA 2012 a Vessel Traffic Management Plan that would require TJLP to incorporate contractual measures to support participation of TMJ-related vessels in the VFPA-led ECHO Program seasonal slowdown initiatives (as amended) or a future equivalent, and annual reporting on TJLP's participation in regional environmental management measures and cumulative effects monitoring to protect SRKW, where feasible. The seasonal slowdown initiatives currently request vessels to slow down in key SRKW foraging areas such as Swiftsure Banks, Haro Strait and Boundary Pass.
- Concern that wakes occurring in increased frequency as a result of TMJ-related vessels would increase erosion and the ability of T'Sou-ke members to continue exercise their Rights traditional activities in foreshore areas.
    - The EAO agrees with TJLP's assessment that TMJ-related vessel wakes wave energy would be within natural variation of the wave heights in this area (see the Vessel Wake section (Section 5.4) of Part B)) and concludes that TMJ would have no residual effects on heritage resources from erosion due to wake effects/propeller wash in the MSA area.
    - The EAO considered that TMJ-related marine shipping may cause infrequent, short-term, temporary disruptions predicted to result in negligible effects on Indigenous access to terrestrially based sites that are accessed by boat from the

pilot station at Sand Heads to the 12 nm territorial limit.

Conclusion

The EAO predicts the TMJ-related marine shipping effects alone would have **negligible-to-minor** impacts on T'Sou-ke First Nation's other cultural and traditional interests, although the EAO acknowledges that there is uncertainty in the relationship between incremental increases in shipping and the availability of cultural resources, such as SRKW. However, in consideration of the available information, the EAO's consultation with T'Sou-ke First Nation, T'Sou-ke First Nation's engagement with TJLP, TJLP's commitments and the EAO's proposed EAC conditions if an EAC is issued and the recommended KMMs under CEAA 2012, the EAO concludes that TMJ-related marine shipping effects combined with cumulative effects in the MSA area is expected to result in **moderate-to-serious** impact on T'Sou-ke First Nation's other traditional and cultural interests. The EAO's conclusions of significant cumulative effects to SRKW was a major key factor considered in the EAO's seriousness determination. The EAO notes several regional initiatives and measures have been implemented by the Government of Canada to better understand and manage cumulative effects on the recovery of SRKWs (listed in Section 13.1.1).

The key factors that were considered in support of EAO's conclusion on the impacts to other traditional and cultural interests are summarized as follows:

Cultural and Heritage Resources:

- The EAO's conclusions in the Heritage Resources section of Part B did not predict residual effects to Heritage Resources (Section 7.1) from erosion due to wake effects along the shorelines of the MSA area;
- The EAO's conclusions in Part B section on Marine Mammals, which found low to moderate magnitude residual effects from TMJ-related vessels on SRKWs and significant cumulative effects to SRKWs due to underwater noise; and
- The MSA area is a heavily utilized marine environment.

Geospatial:

- T'Sou-ke First Nation reports many culturally important areas along the coast areas of the Strait of Juan de Fuca including place names; a birth place; gathering places (for elders' gatherings, youth gatherings, ceremonial, teaching and spiritual places);
- T'Sou-ke First Nation's connection to other communities on Vancouver Island and the USA through canoe journeys (including crossing shipping lanes); and
- The EAO considers TMJ would result in an incremental increase (i.e., 0.2 – 1.1 % for segments A – D) to vessel traffic when compared to baseline conditions in the Traffic

Separation Scheme of the Salish Sea would result in negligible to low magnitude effects due to relatively infrequent and short-duration interruptions to access to areas in the Salish Sea.

Social, Cultural, Experiential:

- Potential negligible to low impacts due to incremental increases from TMJ-related vessel traffic during operations affecting visual quality, noise, and vessel wake (with an increasing magnitude of effect the closer one is to the vessels);
- T'Sou-ke First Nation's connections to cultural use areas, other communities through traditional travel ways, and traditional practices such as canoe journeys in the MSA area are important to T'Sou-ke First Nation culture;
- Potential concerns regarding safety of small vessels with large vessels and wake effects, as assessed in the Accidents and Malfunctions and Effects of the Environment section in Part B; and
- T'Sou-ke First Nation's cultural and spiritual interest in SRKWs

Mitigations:

- Proposed mitigations for potential impacts to traditional and cultural interests are the recommended key mitigations under CEAA 2012 for a Marine Communications, and Vessel Traffic Management Plans, and a Marine Shipping Emergency Response Outreach Program; and
- The EAO is recommending as KMMs under CEAA 2012 for a Vessel Traffic Management Plan that would require TJLP to incorporate contractual measures to support participation of TMJ-related vessels in the VFPA-led ECHO Program seasonal slowdown initiatives (as amended) or a future equivalent, and annual reporting on TJLP's participation in regional environmental management measures and cumulative effects monitoring to protect SRKW, where feasible. The seasonal slowdown initiatives currently request vessels to slow down in key SRKW foraging areas such as Swiftsure Banks, Haro Strait and Boundary Pass.

16.8 MALAHAT NATION

16.8.1 COMMUNITY PROFILE

Malahat Nation (Malahat) is one of the Indigenous Groups that constitute the W̱SÁNEĆ (Saanich) people, which are a Coast Salish cultural group of people that has occupied the Strait of Georgia continuously for thousands of years. Malahat Nation has secondary familial and cultural connections to the Quw'utsun people and Malahat members historically and to the present speak Hul'qumi'num. Further to this Malahat Nation has had long standing connections with Nations across the border in Washington. The Samish language was spoken by past Malahat members, and the tradition is carried on by current Malahat members.

Malahat Nation is located on the east coast of Vancouver Island and has two reserves. As of February 2022, Malahat Nation has a registered population of 361 people with 141 living on Malahat Nation reserves, 163 living off-reserve, and 57 living on other reserves[374]. Malahat Nation

Malahat Nation is part of the Te'mexw Treaty Association, along with Scia'new (Beecher Bay) First Nation, Snaw-Naw-As (Nanoose First Nation), Songhees Nation, and T'Sou-ke First Nation, and is operating within the final phases of the modern treaty process (Stage 5). Malahat Nation reported that through decades of intensive negotiations with the provincial and federal governments, it has made significant process in solidifying its rights, title, and jurisdiction over the entirety of Malahat Nation's territory, but especially the marine environment. Malahat Nation is also part of the Naut'sa mawt Tribal Council along with Halalt, Homalco, Klahoose First Nation, K'ómoks First Nation, T'Sou-ke First Nation, Tla'amin Nation, Snaw-Naw-As (Nanoose First Nation), Stz'uminus First Nation, Tsawwassen First Nation, and Tsleil-Waututh Nation.

Malahat Nation traditional marine use was heavily influenced by the seasons. Malahat Nation engaged in seasonal round-based on hunting, fishing, harvesting, and preserving seafood and making houses, canoes, weapons, and tools. Community members had permanent winter villages on Vancouver Island where they had potlatches and dance ceremonies and prepared items for inter-community trade. Malahat families travelled to coastal regions and islands (e.g. Saanich Inlet and Gulf Islands) in the summer, following salmon movements as fish were their most important resource. The W̱SÁNEĆ would net sockeye and humpback (pink) salmon all the way out to Point Roberts beginning in late spring, returning to the Saanich Inlet in the fall when

[374] Indigenous and Northern Affairs Canada. 2022. First Nation Profiles – Malahat Nation. https://fnp-ppn.aadnc-aandc.gc.ca/fnp/Main/Search/FNRegPopulation.aspx?BAND_NUMBER=647&lang=eng, Accessed March 22, 2022.

the seasonal round cycle ended with chum salmon harvested at Goldstream. During the summer the Malahat visited other communities via trails and travel ways throughout the West Coast and into the Rocky Mountains to compete in contests, attend ceremonies, and trade.

W̱SÁNEĆ families maintained reef net fishing sites throughout their traditional marine territory along the salmon migration route to the Fraser River. The Malahat Nation see places of traditional use as holistic and transcending space and time. Traditional use cannot be delineated into past and present; instead, traditional use is seen in the context of time immemorial, and equal value is placed upon past, present, and future use sites and practices.

Malahat Nation continues to harvest marine and terrestrial wildlife species, from a few primary locations: Saanich Inlet, Cowichan River and Shawnigan Lake area, Fraser River coastal region, and Gulf and San Juan Islands region. Salmon is still the most important subsistence species harvested by the Malahat; additional species such as cod, steelhead, halibut, herring and herring roe, lingcod, crab, oyster, clam, sea urchin, and others are also harvested. The Malahat Nation report hunting sea lion, seal, harbour porpoise, duck, bear, deer, duck, and pheasant. SRKWs are not currently harvested but still used as an indicator species to monitor ecosystem health and for the cultural activity of whale viewing.

The Malahat Nation use blueberries, salmon berries, thimble berries, strawberries, raspberries, cucumber, hops, cauliflower, kelp, and seaweed gathered throughout their traditional territory for food, fuel, and material. Malahat Nation also identified that its members also rely on several beach plants including Bare-stemmed Desert Parsley for cultural uses.

Malahat Nation's sacred sites are located throughout their traditional territory and include ceremonial, spiritual, and burial sites. Community gatherings are also sacred events where Salish culture is transmitted to maintain cultural continuity. Trails and travelways are still important to the Malahat for continuing their relationships with other Salish communities.

16.8.2 MALAHAT NATION INVOLVEMENT IN THE CONSULTATION PROCESS

Consultation with Indigenous groups identified in Schedule D began in July of 2019 when EAO sent a letter to Indigenous groups identified in Schedule D inviting comments on the draft Section 13 Order, including consultation processes and opportunities. On August 6, 2019, at the request of Canada, the EAO under the Section 13 Order amended the geographic scope for the assessment of the marine shipping route and added the Indigenous groups identified in Schedule D which included the Malahat Nation. For the review of the MSA, the EAO led consultation activities with the Indigenous groups identified in Schedule D and, as part of this work, invited Malahat Nation to participate in the Marine Shipping Working Group. The EAO is of the view that it has approached consultation with Malahat Nation at the deeper end of the

spectrum, with the intent to identify potential impacts and consider ways to address potential impacts to Aboriginal Interests that were identified by Malahat Nation within the MSA area.

During the MSA review, the EAO invited Malahat Nation to review and provide comments on TJLP's MSA Supplemental Analysis, the EAO's draft Assessment Report (including Part C of the Assessment Report), the draft CPD and draft Certificate Conditions. As part of the Marine Shipping Working Group, Malahat Nation was invited to participate in Marine Shipping Working Group meetings during the MSA Supplemental Analysis, and BVSA Report Review stages. During review of TJLP's BVSA Report, Malahat Nation attended two Working Group meetings. The EAO met directly with Malahat Nation to discuss TMJ, the EA process, and any potential concerns with TMJ. The EAO understands and respects that Malahat Nation feels that consultation on TMJ has not been as effective as Malahat Nation would have liked, and that Malahat Nation expect meaningful consultation goes beyond sending emails to provide notification of the status of the project.

Near the end of the EA process for TMJ, Malahat Nation reviewed the EAO's statement on adequacy of mitigation and accommodation measures, and fulfillment of its consultation obligations regarding the EA process TMJ, which is included in the Conclusions Section (Part D) of this Assessment Report. In response, Malahat Nation emphasize the importance of:

- TJLP committing to target thresholds to work within;
- Contingency plans, should the thresholds be exceeded, need to be in place prior to construction;
- Monitoring and assessment must be ongoing throughout the construction period and for the life of the project;
- Ongoing communication with Indigenous Groups; and
- Operating within the precautionary principle when working in heavily impacted environments.

16.8.3 POTENTIAL IMPACTS TO TREATY RIGHTS AND OTHER INTERESTS

The following sections focus on potential impacts of TMJ to Malahat Nation's Douglas Treaty rights to hunt and fish and other interests. A discussion of the EAO's assessment approach is provided in Impact Assessment Methods of Part C (Section 12.2).

Canada recognizes the Douglas Treaties and understands Malahat Nation has members who are descendants of one or more signatories to one or more Douglas Treaties. Canada remains committed to working toward a common understanding of the content and scope of the Douglas Treaties with Malahat Nation, to implement the treaty through agreements with the

Crown, and to explore opportunities to honour and recognize the Douglas Treaties. British Columbia recognizes that Malahat Nation asserts Aboriginal Interests and Douglas Treaty rights in the MSA and seeks information to inform this understanding through consultation with Malahat Nation.

The EAO considered information available, including from public sources as well as relevant issues raised by Malahat Nation and members during the EA process (e.g., in meetings), in the following assessments of the potential impacts of TMJ on Malahat Nation's Douglas Treaty rights to hunt and fish and other interests.

The following sections focus on potential impacts of TMJ to Malahat Nation's Douglas Treaty right to hunt and fish and other interests, mitigations, and accommodations to address potential impacts.

A. POTENTIAL IMPACTS ON FISHING

The EAO evaluated the potential effects of TMJ on Aboriginal fishing rights and provided a summary in Section 13.3.1. In addition, the EAO considered relevant information related to the potential shipping-related effects based on review of the RBT2 and TMX processes. The EAO is satisfied that the key impacts to biophysical components resulting in changes to fish quantity and quality, changes in access to fishing resources, and changes to social, cultural, and spiritual values associate with traditional fishing activities that apply to Malahat Nation are summarized in Section 13.3.1.

During the EA, Malahat Nation expressed concern that TJLP's assessment underestimated the magnitude of residual effects to fish and fish habitat from TMJ-related construction and marine shipping, including disturbances to brackish water habitats for juvenile salmon, potential for environmental contamination due to spills and contribution to further salmon declines and ongoing impacts in the Fraser River and MSA.

- See Section 13.3.1 for a detailed discussion of issues and concerns raised by Indigenous Groups related to the effects on fish, fish habitat and fishing rights. The EAO is proposing federal KMMs under CEAA 2012, including the Fish Mitigations to Reduce Harm and Mortality, Fish Habitat Offset Plan, and Study and Vessel Traffic Management Plan and concludes that effects to fish and fish habitat from TMJ would not be significant within the LAA/RAA and no residual effects were predicted within the MSA.

During the EA, Malahat Nation expressed concern that TMJ-related shipping activities would negatively impact Malahat harvesters' safety and experience during harvesting and that predicted vessel wake were likely underestimated in the EA because only the calmest days during the summer months are selected for traditional activities such as harvesting and canoe journeys and there are accounts of canoes sinking due to wakes from freighters. Malahat

Nation asked whether the TJLP could enforce a mandatory vessel slowdown in these areas to mitigate effects.

- As outlined in the Current Use assessment in Part B, potential negligible to low magnitude impacts to the experiential aspect of fishing in the MSA due to TMJ-related vessel traffic and potential concerns regarding safety regularly occurring vessels transits during the operations for Indigenous Groups who harvest fish in, or in proximity to, the navigational channel or shipping lanes, or those who need to cross these areas to access fishing resources;
- TJLP has stated that TMJ's influence on TMJ-related vessel operations would be limited beyond TMJ's marine terminal area, but TJLP has committed to a Marine Communication Plan out to 12 nm that would be developed in consultation with Schedule B and D Indigenous Groups and include procedures to inform Indigenous Groups of traffic schedules, for Indigenous Groups to provide feedback on adverse effects related to navigation as a result of TMJ, and for TJLP to document and respond to feedback in a timely manner; and
- The EAO also acknowledges that the TMJ-specific mitigation measures would not reduce impacts to quality of experience because some Indigenous people may find the presence and sounds of LNG carriers disturbing for safety and/or aesthetic reasons, or for other reasons.

Conclusion

In consideration of the available information, the EAO's consultation with Malahat Nation, TJLP's commitments, and the EAO's proposed EAC conditions if an EAC is issued and the recommended KMMs under CEAA 2012, TMJ is expected to result in **negligible-to-minor** impact on Malahat Nation's right to fish. The EAO considers TMJ-related increases to vessel traffic during operations would be incremental compared to existing baseline conditions in the Traffic Separation Scheme of the Salish Sea

The key factors that were considered in support of the EAO's conclusion on the impacts to the right to fish are summarized as follows:

Biophysical:

- The EAO's conclusions on in the Fish and Fish Habitat chapter in Part B which do not predict any residual effects to fish and fish habitat in the MSA area; and
- The MSA area is a heavily utilized marine environment.

Geospatial:

- Malahat Nation continues to harvest marine species, from a few primary locations: Saanich Inlet, Cowichan River and Shawnigan Lake area, Fraser River coastal region, and Gulf and San Juan Islands region;
- The EAO considers TMJ would result in an incremental increase (i.e., 0.2 – 1.1 % for segments A – D) in vessel traffic when compared to baseline conditions in the Traffic Separation Scheme of the Salish Sea; and
- The EAO's conclusions in the Current Use of Part B that TMJ-related vessel transits during operations (minimum 30 years) would result in negligible to low magnitude effects due to relatively infrequent and short-duration interruptions to access to areas in the Salish Sea.

Social, Cultural and Experiential:

- Potential negligible to low impacts due to incremental increases from TMJ-related vessel traffic during operations affecting visual quality, noise, and vessel wake (with an increasing magnitude of effect the closer one is to the vessels); and
- Malahat Nation have informed the EAO that traditional harvesting by Malahat Nation is reserved for the calmest days in the summer.

Mitigations:

- Proposed mitigations for impacts to Malahat Nation's right to fish include the Marine Communications Plan recommended as KMMs under CEAA 2012.

B. POTENTIAL IMPACTS ON HUNTING, TRAPPING AND GATHERING

The EAO evaluated the potential effects on hunting, trapping and gathering rights attributable to TMJ which apply broadly to Indigenous Groups. These potential effects are summarized in Section 13.2.2. In addition, the EAO considered the potential effects based on review of the RBT2 Panel process and TMX. The EAO is satisfied that the key impacts to biophysical components resulting in changes to wildlife and vegetation quantity and quality, changes in access to hunting, trapping and gathering areas, and changes to social, cultural, and spiritual values associated with traditional hunting, trapping and gathering activities that apply to Malahat Nation are summarized in Section 13.2.1.

Additional issues and concerns with potential impacts related to hunting, trapping, and gathering were raised by Malahat Nation during the EAs of RBT2 and TMX. These concerns were not raised by Malahat Nation during the TMJ EA but the EAO considers them applicable to the MSA area.

- Concerns regarding noise generated by vessels nearby terrestrial-based harvesting activities, such as hunting, may interrupt or disrupt these activities.
    - The EAO's conclusions in the Current Use section of Part B of this Report determined that noise resulting from TMJ-related shipping activities would not result in a measurable effect on hunting, trapping, or gathering in the MSA area.

Conclusion

In consideration of the available information in Section 13.3.2, which outlines the potential effect to hunting, trapping and gathering, consultation with Malahat Nation, TJLP's commitments, and the EAO's proposed EAC conditions if an EAC is issued and the recommended KMMs under CEAA 2012, TMJ is expected to result in **negligible** impact on Malahat Nation's right to hunt, trap and gather.

The key factors that were considered in support of EAO's conclusion on the impacts to the right to hunt, trap and gather included the EAO's conclusions on adverse residual effects to wildlife in the MSA area predict negligible to low magnitude mortality of select marine bird species. The EAO also considered that in the MSA area, operations (30 years in duration) may cause infrequent, short-term, temporary disruptions to marine-based hunting along the proposed LNG vessel route and negligible effects on Indigenous access to terrestrially based hunting, trapping, and gathering sites that are accessed by boat from the pilot station at Sand Heads to the 12 nm territorial limit.

To mitigate potential impacts to Malahat Nation's right to hunt, trap and gather, the EAO is recommending a KMM under CEAA 2012 for a Marine Communication Plan, including procedures to inform Indigenous Groups of traffic schedules and for Indigenous Groups to submit any feedback on potential adverse effects on navigation as a result of TMJ. The EAO also considered that the small relative increase due to TMJ-related vessel traffic would have a negligible effect to experiential aspects of hunting, trapping, and gathering from changes to visual quality and noise in the MSA and that all TMJ related vessels would adhere to the Marine Regulations and Legislation regulating vessel noise and lighting.

C. POTENTIAL IMPACTS ON OTHER TRADITIONAL AND CULTURAL INTERESTS

The EAO evaluated the potential for TMJ-related residual and cumulative effects to impact other traditional and cultural interests of Indigenous Groups in the MSA, as summarized in Section 13.3.3. In its evaluation, the EAO considered potential marine-shipping related effects pathways to impacts based on review of publicly available information from RBT2 and TMX processes, and any information provided by Indigenous Groups during the MSA review. The EAO is satisfied that TMJ's marine shipping-related effects in the MSA area to access, quality of

experience and SRKWs would be the pathways to impacts to Malahat Nation's other cultural and traditional interests.

Malahat Nation raised the following concerns regarding potential impacts on other traditional and cultural interests due to TMJ:

- Interest in reducing effects to travel required for food harvest, ecotourism, tribal journeys (canoe voyage)
    - The EAO predicted in the Current Use of Lands and Resources for Traditional Purposes section of this Report that relatively infrequent and short duration interruptions to access to marine areas in the Salish Sea due to TMJ-related vessel traffic would be negligible to low magnitude. The EAO is recommending a KMM under CEAA 2012 for a Marine Communication Plan to 12 nm including a communication procedure for TJLP to share traffic schedules with Indigenous Groups, however, the EAO acknowledges that Indigenous people may find the presence and sound of LNG carriers disturbing for safety and/or aesthetic reasons, or for other reasons.
- Concerns about potential risks related to marine shipping including pilotage areas, impacts to human health and the environment from spills and spill liability compensation.
    - Marine shipping associated with TMJ would be required to meet the international standards and Canadian regulations set out by Canada's compliance-based marine safety and security system, which is designed to protect life, property, and the marine environment. Refer to the Accidents and Malfunctions chapter (Section 9.3) for more details.
    - The EAO is recommending a KMM under CEAA 2012 for a Marine Shipping Emergency Response Outreach Program that would facilitate the integration of plans for responding to incidents in transit into existing emergency response systems, primarily the CCG's Incident Integrated Response Plans
- Concern about the effects of increased marine shipping on SRKW. The EAO also understands that SRKW are of importance to Malahat Nation culture because Malahat Nation identified this during the EAs of RBT2 and TMX and therefore EAO considered this applicable to the MSA area During the MSA review, Malahat Nation expressed concern that underwater noise and vessel strikes from TMJ-relative vessel increases would have impacts on SRKWs and indicated that Indigenous groups should be involved in auditing the whale strike self-reporting program and suggested that TMJ-vessels travel at reduced speeds of 10 knots to mitigate risk of whale strikes.

- See Section 13.3.3 for a detailed discussion of the analysis and resolution of concerns related to the effects on whales. As discussed in Section 13.3.3, the EAO concluded that TMJ would not result in significant residual effects to Marine Mammals; however, the EAO notes that the current baseline of cumulative effects to SRKWs are already high and that TMJ would contribute additional residual effects from shipping noise and potential avoidance behaviour by SRKWs to ships, such that cumulative effects to SRKWs are considered significant.
- The EAO has recommended KMMs under CEAA 2012 for Vessel Traffic Management Plans that would require TJLP to incorporate contractual measures to support participation of TMJ-related vessels in the VFPA-led ECHO Program seasonal slowdown initiatives (as amended) or a future equivalent, and annual reporting on TJLP's participation in regional environmental management measures and cumulative effects monitoring to protect SRKW, where feasible. The seasonal slowdown initiatives currently request vessels to slow down in key SRKW foraging areas such as Swiftsure Banks, Haro Strait and Boundary Pass. In response to the concerns raised by Malahat Nation, the EAO updated the recommended KMM under CEAA 2012 requiring TJLP to report vessel marine mammal collisions to Indigenous Groups, in addition to DFO.

- Concerns regarding increased erosion of shoreline and effect on archaeological resources. Malahat Nation emphasized that impacts of cumulative effects on cultural sites located along the shoreline, and that increased wave energy is causing erosion of cultural and spiritual sites that are significant to Malahat Nation.
  - Malahat Nation expressed concern that TJLP's estimation that vessel-related waves from the shipping lane would be indiscernible from the natural wave environment for areas that vessels pass closer to the shoreline (e.g., Areas in zones 1, 2 and 3, around the southern gulf islands and Victoria) as erosion impacts are higher. Malahat Nation asked whether TJLP could enforce a mandatory vessel slowdown in these areas or incentivize vessels to be retrofitted with engine and propeller noise reductions technologies to mitigate effects. Malahat Nation suggested further estimations for wake effects consider location and times with low natural wave energy and not only consider average values.
  - The EAO agrees with TJLP's assessment that TMJ-related vessel wakes wave energy would be negligible in comparison to the natural wave environment and concludes that TMJ would have no residual effects on heritage resources from erosion due to wake effects/propeller wash in the MSA area, including shorelines located closer to the shipping lanes.

- Concerns regarding marine safety and navigation associated with vessels and wake. During the EA, Malahat Nation expressed concern that TMJ-related shipping activities would negatively impact members safety and experience during canoe journeys and vessel wake-effects were likely underestimated as only the calmest days during the summer months are selected for traditional activities including harvesting and canoe journeys. The Malahat Nation reported accounts of canoes sinking due to wakes from freighters. During the MSA review, Malahat Nation asked whether TJLP could enforce a mandatory vessel slowdown in these areas to mitigate effects.
    - The EAO considers that the safety of small vessels with large vessels and wake effects were assessed in the Accidents and Malfunctions and Section of Part B and that TMJ associated marine shipping would include monitoring of compliance with maritime regulations and legislation such as the *Canada Shipping Act* and the Collision Regulations.
    - The EAO is recommending a KMM under CEAA 2012 for a Marine Communication Plan out to 12 nm with procedures to inform Indigenous Groups of traffic schedules, for Indigenous Groups to provide feedback on adverse effects related to navigation as a result of TMJ, and for TJLP to document and respond to feedback in a timely manner.

- Malahat Nation suggested a potential mitigation to implement a cap a trade system on commercial vessels to reduce cumulative effects from marine shipping in the region.
    - In response to this recommendation, TC communicated to Malahat Nation that under the Ocean's Protection Plan, through the Cumulative Effects of Marine Shipping (CEMS) Initiative and Indigenous and Local Communities Engagement Partnership Program (ILCEPP), the Commitment to Action and Results (C2AR) Accord was signed in 2019 with the First Nations Fisheries Council under ILCEPP, and CEMS has been identified as a priority initiative to proceed under the Indigenous Ship Movement and Vessel Management Coordination Committee (SVCC), as part of this approach.
    - The EAO understands that that next steps under this initiative include the co-development of a Terms of Reference and workplan for conducting the South Coast wide regional cumulative effects assessment of marine shipping, with the SVCC, but TC was also interested in working with South Coast Nations in sub-regional assessments that would address more localized marine shipping issues and assessment priorities, and would also inform the larger South Coast wide assessment, in a multi-layered assessment approach and that discussions are ongoing between the TC CEMS team and Malahat Nation in this regard. Further information related to the EAO's consideration of existing regional Government of

Canada initiatives, is included in Section 13.1.1.

Additional issues and concerns with potential impacts related to traditional and cultural interests were raised by Malahat Nation during the EAs of RBT2 and TMX. These concerns were not raised by Malahat Nation during the TMJ EA but the EAO considers them applicable to the MSA area:

- Concerns regarding impact of vessel traffic on cultural revival activities and livelihood.
    - In the Current Use section in Part B of this Report it was determined that with the marine transportation regulatory regime, as well as low frequency and short duration of TMJ-related traffic there would be negligible to low magnitude effects on Indigenous access to areas in the MSA area.

Conclusion

The EAO predicts the TMJ-related marine shipping effects alone would have **negligible-to-minor** impacts on Malahat Nation's other cultural and traditional interests, although the EAO acknowledges that there is uncertainty in the relationship between incremental increases in shipping, the availability of cultural resources such as SRKW. In consideration of the available, the EAO's consultation with Malahat Nation, TJLP's commitments and the EAO's proposed EAC conditions if an EAC is issued and the recommended KMMs under CEAA 2012, the impacts from TMJ combined with cumulative effects is expected to result in **moderate-to-serious** impact on Malahat Nation's other traditional and cultural interests. The EAO's conclusions of significant cumulative effects to SRKW was a major key factor considered in the EAO's seriousness determination. The EAO notes several regional initiatives and measures have been implemented by the Government of Canada to better understand and manage cumulative effects on the recovery of SRKWs (listed in Section 13.1.1).

The key factors that were considered in support of EAO's conclusion on the impacts to other traditional and cultural interests are summarized as follows:

Cultural and Heritage Resources:

- The EAO's conclusions in the Heritage Resources section of Part B did not predict residual effects on Heritage Resources (Section 7.1) from erosion due to wake effects along the shorelines of the MSA area;
- The EAO's conclusions in the Marine Mammals section of Part B, which found residual effects from TMJ-related vessels on SRKWs and significant cumulative effects to SRKWs due to underwater noise; and
- The MSA area is a heavily utilized marine environment. Malahat Nation emphasized that impacts of cumulative effects on cultural sites located along the shoreline, and that

increased wave energy is causing erosion of cultural and spiritual sites that are significant to Malahat Nation

Geospatial:

- The EAO's conclusions in the Current Use section in Part B found that TMJ-related vessel transits would be regular and of relatively short duration passing through areas in the Salish Sea; and
- The EAO considers TMJ would result in an incremental increase (i.e., 0.2 – 1.1 % for segments A – D) to vessel traffic when compared to baseline conditions in the Traffic Separation Scheme of the Salish Sea would result in negligible to low magnitude effects due to relatively infrequent and short-duration interruptions to access to areas in the Salish Sea.

Social, Cultural, Experiential:

- Potential negligible to low impacts from TMJ-related vessel traffic during operations affecting visual quality, noise and vessel wake (with an increasing magnitude of effect the closer one is to the vessels);
- Traditional activities such as harvesting, and canoe journeys are preferentially carried out during the calmest days in the summer;
- Concerns regarding safety of small vessels with large vessels and wake effects, as assessed in the Accidents and Malfunctions and Effects of the Environment section in Part B; and
- Malahat Nation's cultural and spiritual interest in SRKWs.

Mitigations:

- Proposed mitigations for potential impacts to traditional and cultural interests are the recommended key mitigations under CEAA 2012 for Marine Communications and Vessel Traffic Management Plans and Marine Shipping Emergency Response Outreach Program;
- The EAO is recommending as KMMs under CEAA 2012 for a Vessel Traffic Management Plan that would require TJLP to incorporate contractual measures to support participation of TMJ-related vessels in the VFPA-led ECHO Program seasonal slowdown initiatives (as amended) or a future equivalent, and annual reporting on TJLP's participation in regional environmental management measures and cumulative effects monitoring to protect SRKW, where feasible. The seasonal slowdown initiatives currently request vessels to slow down in key SRKW foraging areas such as Swiftsure

Banks, Haro Strait and Boundary Pass; and

- The EAO acknowledges that these mitigation measures would not reduce impacts for baseline conditions and/ or impact of future projects, which are a source of issues for many Indigenous Groups.

16.9 TSARTLIP FIRST NATION

16.9.1 COMMUNITY PROFILE

W̱JOŁEŁP (Tsartlip) First Nation is one the Indigenous Groups that constitute the W̱SÁNEĆ (Saanich) people , Malahat Nation which are a Coast Salish cultural group of people that has occupied the Strait of Georgia continuously for thousands of years. Tsartlip First Nation is located on the Saanich Peninsula on Vancouver Island and has four reserves. As of February 2022, Tsartlip First Nation has a registered population of 1,031 with 536 living on Tsartlip First Nation reserves, 368 living off-reserve, and 127 living on other reserves[375]. Tsartlip First Nation territory includes the lands and waters of the W̱SÁNEĆ.

W̱JOŁEŁP (Tsartlip) means “Place of the maple leaves,” named after the Broad-leaf maples in Saanich. The Tsartlip origin story describes a woman and her young son, KWELOXWNTHET, fleeing East Saanich to escape violence and wandering throughout XWSANETS (Saanich Peninsula) until coming to a beautiful place the woman names WXTS’HELH (Tsartlip). The woman stays there to raise her son, and the Tsartlip people become known as TS’ESINGSET, meaning “growing up,” referring to people who raise themselves up to never be defeated again. In W̱SÁNEĆ creation stories the Creator X’ALS turns their ancestors into islands and tells the remaining people to look after their “relatives of the deep.” As many components of nature were people transformed and gifted to the W̱SÁNEĆ, they see themselves as equal actors in their environment and maintain these relationships through rituals and laws.

The W̱SÁNEĆ have the traditional role of ocean stewards and a cultural commitment to maintain ecosystem balance. This sacred, timeless responsibility guides the practices of the contemporary Tsartlip First Nation in managing their marine territory to benefit all inhabitants. XWSANETS is the “home base” of the W̱SÁNEĆ. This name means “raised up” or “emerging people” and derives from the image of the landscape presented to canoes approaching in the water. The naming practice based on the perspective of the water reveals the fundamental

[375] Indigenous and Northern Affairs Canada. 2022. First Nation Profiles – Tsartlip. https://fnp-ppn.aadnc-aandc.gc.ca/fnp/Main/Search/FNRegPopulation.aspx?BAND_NUMBER=653&lang=eng, Accessed March 23, 2022.

nature of marine territory to the W̱SÁNEĆ worldview. Before contact, the W̱SÁNEĆ Nations were a single group of extended families sharing the SENĆOŦEN language, stewardship responsibilities, and a cultural order revolving around their relations with marine creatures, spirit beings, and one another. The relationship of the W̱SÁNEĆ with their marine environment drives their society, economy, culture, and identity.

W̱SÁNEĆ families had permanent winter settlements on the Saanich Peninsula and temporary settlements throughout the San Juan and southern Gulf Islands and across the Salish Sea to Point Roberts and Boundary Bay. This territory is defined by the pursuit of the five salmon species and steelhead and is where the W̱SÁNEĆ assert continuous and exclusive use and occupation since time immemorial. The 1987 Saanich Declaration describes W̱SÁNEĆ territory as "[encompassing] all [their] Spiritual Places, medicine and fruit gathering places, fishing stations, hunting and trapping areas, winter and summer homesites, burial sites, meditation places and all our territories in between these places."

Tsartlip First Nation has Douglas Treaty Rights to hunt on unoccupied lands and carry on their fisheries "as formerly." Tsartlip First Nation asserts that it holds Aboriginal rights and title within its territory. Shipping traffic transits through Tsartlip First Nation territorial waters. Cumulative effects such as declining runs, environmental degradation, fishing regulations, and vessel wakes are barriers limiting Tsartlip First Nation harvest, violating their Douglas Treaty and Aboriginal rights.

Tsartlip First Nation use the Salish Sea to hunt, fish, gather, travel, and harvest; harvest varies according to the tides, season, and traditional W̱SÁNEĆ calendar. Marine foods are the preferred Tsartlip First Nation diet. Tsartlip First Nation conduct both subsistence and commercial fishing and harvesting via small boats to feed their families and communities and for inter-community trade.

W̱SÁNEĆ continue to gather seaweed and hunt deer and ducks on islands near the shipping lanes. The surf scoter is prized by the W̱SÁNEĆ for sacred ceremonial use. Herring and herring roe were traditionally harvested in the area but, according to Tsartlip First Nation, no longer persist due to frequent ship traffic. Marine invertebrate harvesting plays a significant role in feeding the community. Chiton and sea urchin are preferred by the Tsartlip First Nation and are highly culturally valuable but currently difficult to find.

The Coast Salish are sometimes called the "salmon people" due to heavy reliance on salmon for seasonal rounds and cultural practices. Unlike other Coast Salish peoples, the W̱SÁNEĆ did not have major rivers within their territory, so fished for salmon in the sea through their unique reef net method and were thus called the "saltwater people." ŦEKI (sockeye) is the most prized species of the Coast Salish, including for the W̱SÁNEĆ. The Tsartlip First Nation have continued

reliance on salmon for sustenance. Next to salmon, halibut were a preference of the Coast Salish and were referred to as E'lis, meaning "sister."

Fish were caught using the unique SX̱OLE (reef net), as well as gaffs, harpoons, and dip and trawl nets. The W̱SÁNEĆ had reef net fishing sites throughout their traditional territory; reef net fishing is a way of life and is part of the W̱SÁNEĆ identity. The largest immemorial reef net claim was at Point Roberts and another on ŚNEWIŁ (the Fraser River), but this fishery is not currently practiced as it was outlawed by the government in 1916; the W̱SÁNEĆ are working to revive this sacred fishery. Tsartlip Indian Band identified Active Pass, Swanson Channel and Boundary Pass, Pender Island and Race Rocks as locations of historic reef-net sites within the MSA. Harvesters report salmon fishing locations at Stuart Island and southwest of San Juan Island and indicate that the preferred travel route for accessing these locations is boating directly east from the Saanich Peninsula across the international border.

Tsartlip First Nation reported burial sites, midden sites and villages within the MSA including sites throughout the Gulf Islands and specifically Saturna Island, Coates Cove, Grace Islet and multiple site in and around the Saanich Peninsula.

The Tsartlip First Nation have a spiritual connection with KELŁOLEMEĆEN (orcas), which guide Tsartlip First Nation harvesters in their marine voyages and are used to track salmon. The Tsartlip First Nation and orcas have a mutual responsibility to protect each other. Harm to orcas constitutes a great loss to the Tsartlip First Nation, as when ocean health is jeopardized so is that of the W̱SÁNEĆ.

The Tsartlip First Nation have preferred traditional marine use sites for fishing, gathering, travelling, and hunting, as well as burial, heritage, and sacred sites that are vulnerable to disturbance.

16.9.2 TSARTLIP FIRST NATION INVOLVEMENT IN THE CONSULTATION PROCESS

Consultation with Indigenous groups identified in Schedule D began in July of 2019 when EAO sent a letter to these groups inviting comments on the draft Section 13 Order, including consultation processes and opportunities.

On August 6, 2019, at the request of Canada, the EAO under the Section 13 Order amended the geographic scope for the assessment of the marine shipping route and added the Indigenous groups identified in Schedule D which included the Tsartlip First Nation. For the review of the MSA, the EAO led consultation activities with the Indigenous groups identified in Schedule D and, as part of this work, invited Tsartlip First Nation to participate in the Marine Shipping Working Group. The EAO is of the view that it has approached consultation with Tsartlip First

Nation at the deeper end of the spectrum, with the intent to identify potential impacts and consider ways to address potential impacts to Aboriginal Interests that were identified by Tsartlip First Nation within the MSA area.

During the MSA review, the EAO invited Tsartlip First Nation to review and provide comments on TJLP's MSA Supplemental Analysis, the EAO's draft Assessment Report (including Part C of the Assessment Report), the draft CPD, draft Certificate Conditions and recommended KMMs under CEAA 2012. As part of the Marine Shipping Working Group, Tsartlip First Nation was invited to participate in Marine Shipping Working Group meetings during review of TJLP's MSA Supplemental Analysis and BVSA Report. To support Tsartlip First Nation's participation in the MSA for TMJ, the EAO and IAAC provided capacity funding in the form of grants. In a letter to the EAO dated April 26, 2022, Tsartlip First Nation confirmed interest in participating in the duration of the EA for TMJ. Also in its letter, Tsartlip First Nation identified concerns that TMJ will have cumulative and negative impacts (both direct and indirect) to Tsartlip's Aboriginal and Douglas Treaty rights and interests and that Tsartlip First Nation is concerned that these impacts, would further impair the ability of Tsartlip members to practice their constitutionally protected Aboriginal and Douglas Treaty rights in and around the Project area and throughout Tsartlip's marine territories.

The EAO is of the view that it has approached consultation with Tsartlip First Nation at the deeper end of the spectrum, with the intent to identify potential impacts and consider ways to address any potential impacts to Aboriginal Interests that were identified by Tsartlip First nation within the MSA area. The EAO offered to meet directly with Tsartlip First Nation to discuss TMJ, EA process, and any potential concerns with TMJ. The EAO considered Tsartlip First nation's concerns and perspective related to potential impacts to Tsartlip First Nation's Aboriginal Interests due to TMJ in Part C of the Assessment Report.

16.9.3 TSEYCUM FIRST NATION INVOLVEMENT IN THE CONSULTATION PROCESS

Consultation with Indigenous groups identified in Schedule D began in July of 2019 when EAO sent a letter to these groups inviting comments on the draft Section 13 Order, including consultation processes and opportunities.

On August 6, 2019, at the request of Canada, the EAO under the Section 13 Order amended the geographic scope for the assessment of the marine shipping route and added the Indigenous groups identified in Schedule D which included the Tseycum First Nation. For the review of the MSA, the EAO led consultation activities with the Indigenous groups identified in Schedule D and, as part of this work, invited Tseycum First Nation to participate in the Marine Shipping Working Group. The EAO is of the view that it has approached consultation with Tseycum First

Nation at the deeper end of the spectrum, with the intent to identify potential impacts and consider ways to address potential impacts to Aboriginal Interests that were identified by Tseycum First Nation within in the MSA area.

During the MSA review, the EAO invited Tseycum First Nation to review and provide comments on TJLP's MSA Supplemental Analysis, the EAO's draft Assessment Report (including Part C of the Assessment Report), the draft CPD, draft Certificate Conditions and recommended KMMs under CEAA 2012. As part of the Marine Shipping Working Group, Tseycum First Nation was invited to participate in Marine Shipping Working Group meetings during the MSA Supplemental Analysis Review stages.

The EAO offered to meet directly with Tseycum First Nation to discuss TMJ, EA process, and any potential concerns with TMJ.

16.9.4 POTENTIAL IMPACTS TO TREATY RIGHTS AND OTHER INTERESTS

The following sections focus on potential impacts of TMJ to Tsartlip First Nation's Douglas Treaty rights to hunt and fish and other interests. A discussion of the EAO's assessment approach is provided in Section 12.2 Impact Assessment Methods of Part C.

The EAO considered information available, including from public sources. The EAO reached out to Tsartlip First Nation regarding potential effects on Douglas Treaty rights and other interests, mitigations, and accommodations to address potential impacts but did not receive a response. The following sections focus on potential impacts of TMJ to Tsartlip First Nation's Douglas Treaty rights to hunt and fish, and other interests, mitigations, and accommodations to address potential impacts.

A. POTENTIAL IMPACTS ON FISHING

The EAO evaluated the potential effects of TMJ on Aboriginal fishing rights and provided a summary in Section 13.3.1. In addition, the EAO considered relevant information related to the potential shipping-related effects based on review of the RBT2 and TMX processes. The EAO is satisfied that the key impacts to biophysical components resulting in changes to fish quantity and quality, changes in access to fishing resources, and changes to social, cultural, and spiritual values associate with traditional fishing activities that apply to Tsartlip First Nation are summarized in Section 13.3.1.

The MSA reported on a variety of marine invertebrate harvesting and fishing locations in the MSA area, including near the Gulf Islands and islands in the USA. The MSA also noted locations of historic Tsartlip First Nation reef-net sites within the MSA area, which are considered sacred,

including Active Pass, Swanson Channel, Boundary Pass, the southern tip of South Pender Island and at Race Rocks, in addition to a variety of locations in the USA.

The EAO is aware that Tsartlip First Nation consider that the most significant impacts related to marine shipping would be from the various effects of significantly increased vessel traffic in Tsartlip's marine waters; and the cumulative environmental effects of the already extensive development, shipping, and marine activities within Tsartlip's traditional territory. The EAO heard from Tsartlip First Nation concern that TMJ will have cumulative and negative impacts (both direct and indirect) to Tsartlip's Aboriginal Interests and that these impacts, particularly those affecting fish and fish habitat, the SRKWs, and human health, would further impair the ability of Tsartlip members to practice their constitutionally protected Aboriginal and Douglas Treaty rights in and around the Project area and throughout Tsartlip's marine territories.

Additional issues and concerns with potential impacts related to fishing were raised by Tsartlip First Nation during the EAs of RBT2 and TMX. These concerns were not raised by Tsartlip First Nation during the TMJ EA but the EAO considers them applicable to the MSA area.

- Concerns regarding increased shipping related effects on fish (including salmon and shellfish), their habitat, and the ability of Tsartlip First Nation to harvest them. Concern that the increase in shipping traffic would hinder boat travel and disrupt access to traditional harvesting areas as well as make traditional practices of marine harvesting unsafe. Concerns that additional shipping would displace recreational fishers and increase competition in adjacent high value areas where resources are already limited. Adequate fishing resources are of high cultural importance both for food security, cultural identity, and ceremonial purposes.
    - See Section 13.3.1 for a detailed discussion of the analysis and resolution of impacts to fish and fishing rights. As discussed in Section 13.3.1, the EAO is recommending KMMs under CEAA 2012 for the Fish Mitigations to Reduce Harm and Mortality, Fish Habitat Offset Plan, and Vessel Traffic Management Plan to address these concerns. The EAO did not predict any residual effects to fish and fish habitat in the MSA area.
    - The EAO concluded that TMJ-related vessel wake would be within natural variation of the wave heights in this area (see the Vessel Wake section in Part B of this Report (Section 5.4). The EAO acknowledges that wakes generated by TMJ vessels would be larger the closer one is to the vessel and that the presence of LNG carriers may be considered disturbing by Indigenous people for safety and/or aesthetic reasons, or for other reasons.
    - In the Current Use section of this Report, the EAO predicted regularly occurring and short-duration vessel movements through fishing areas would have

negligible to low magnitude effects to access to harvesting sites in the MSA area. TJLP has stated that TMJ's influence on TMJ-related vessel operations would be limited beyond TMJ's marine terminal area, TJLP has committed a Marine Communication Plan out to 12 nm that would be developed in consultation with Schedule B and D Indigenous Groups and include procedures to inform Indigenous Groups of traffic schedules, for Indigenous Groups to provide feedback on adverse effects related to navigation as a result of TMJ, and for TJLP to document and respond to feedback in a timely manner.

Conclusion

In consideration of the available information, the EAO's consultation with Tsartlip First Nation, TJLP's commitments, the EAO's proposed EAC conditions if an EAC is issued, and the recommended KMMs under CEAA 2012, TMJ is expected to result in **negligible-to-minor** impact on Tsartlip First Nation's right to fish. The EAO considers TMJ-related increases to vessel traffic during operations would be incremental compared to existing baseline conditions in the Traffic Separation Scheme of the Salish Sea.

- The EAO considered Tsartlip First Nation's perspectives on cumulative effects and Tsartlip First Nation's ability to meaningfully practice their fishing rights in the MSA area. The EAO acknowledges that there are already vessels transiting the shipping lanes which can impact Indigenous fishers' access to and quality of experience of fishing. While the EAO recognizes there is some uncertainty when considering how cumulative effects impact Aboriginal Interests and practice of Treaty Rights, the EAO agrees with Tsartlip First Nation, that any increase in vessel traffic at fishing areas within or adjacent with marine shipping routes would potentially be more serious when combined with past, present, and reasonably foreseeable shipping activities. For more information on the EAO's consideration of current context and cumulative effects please see Section 13.1 of Part C.

The key factors that were considered in support of the EAO's conclusion on the impacts to the right to fish are summarized as follows:

Biophysical:

- The EAO's conclusions on adverse residual effects in the Fish and Fish Habitat chapter in Part B which does not predict any residual effects to fish and fish habitat in the MSA area;
- Tsartlip First Nation consider that TMJ will have cumulative and negative impacts (both direct and indirect) to fish and fish habitat, which would further impair the ability of

Tsartlip members to practice their Aboriginal and Douglas Treaty rights in and around the Project area and throughout Tsartlip's marine territories.

Geospatial:

- Tsartlip First Nation harvests marine invertebrates and fishes throughout the MSA area including in areas near to, or requiring crossing of, the shipping lanes;
- Tsartlip First Nation consider the most significant impacts related to marine shipping would be due to significantly increased vessel traffic and cumulative environmental effects that would combine with extensive development, shipping, and marine activities within Tsartlip First Nation's traditional territory.
- The EAO considers TMJ would result in an incremental increase (i.e., 0.2 – 1.1 percent for segments A – D) in vessel traffic when compared to baseline conditions in the Traffic Separation Scheme of the Salish Sea; and
- The EAO's conclusions in the Current Use of Part B that TMJ-related vessel transits during operations (minimum 30 years) would result in negligible to low magnitude effects due to relatively infrequent and short-duration interruptions to access to areas in the Salish Sea

Social, Cultural and Experiential:

- Potential negligible to low impacts due to incremental increases from TMJ-related vessel traffic during operations affecting visual quality, noise, and vessel wake (with an increasing magnitude of effect the closer one is to the vessels);
- Adequate fishing resources are of high cultural importance both for food security, cultural identity, and ceremonial purposes for Tsartlip First Nation; and
- Potential concerns regarding safety of small vessels with large vessels and wake effects, as assessed in the Accidents and Malfunctions and Effects of the Environment section in Part B.

Mitigations:

- Proposed mitigations for impacts to Tsartlip First Nation's right to fish include the Marine Communications, Plan recommended as KMMs under CEAA 2012.

B. POTENTIAL IMPACTS ON HUNTING, TRAPPING AND GATHERING

The EAO evaluated the potential effects on hunting, trapping, and gathering rights attributable to TMJ in Section 13.3.2. In addition, the EAO considered the potential effects based on review of the RBT2 Panel process and TMX. The EAO is satisfied that the key impacts to biophysical

components resulting in changes to wildlife and vegetation quantity and quality, changes in access to hunting, trapping and gathering areas, and changes to social, cultural, and spiritual values associated with traditional hunting, trapping and gathering activities that apply to Tsartlip First Nation are summarized in Section 13.3.2.

The MSA reported a variety of contemporary duck hunting locations including on the eastern waters of Sidney Island, Sidney Spit, Sidney Channel, waters surrounding James Island, the spit at Tsawout and Saanichton Bay. The MSA noted that the surf scooter is the preferred species and is used for ceremonial purposes.

Additional issues and concerns with potential impacts related to hunting, trapping, and gathering were raised by Tsartlip First Nation during the EAs of RBT2 and TMX. These concerns were not raised by Tsartlip First Nation during the TMJ EA but the EAO considers them applicable to the MSA area.

- Concerns regarding impacts to coastal birds, their habitat, and the ability to harvest them.
    - In the Current Use section in Part B of this Report it was determined that TMJ-related shipping activities including noise, visual presence, and vessel wake would have no measurable effect on the experience of hunting, trapping, and gathering activities.

Conclusion

In consideration of the available information in Section 13.3.2, the EAO's consultation with Tsartlip First Nation, TJLP's commitments, the EAO's proposed EAC conditions if an EAC is issued and the recommended KMMs under CEAA 2012, TMJ is expected to result in **negligible** impact on Tsartlip First Nation's right to hunt, trap and gather.

The key factors that were considered in support of the EAO's conclusion on the impacts to the right to hunt, trap and gather included the EAO's conclusions on adverse residual effects to wildlife in the MSA area predict negligible to low magnitude mortality of select marine bird species. The EAO also considered that in the MSA area, operations (30 years in duration) may cause infrequent, short-term, temporary disruptions to marine-based hunting along the proposed LNG vessel route and negligible effects on Indigenous access to terrestrially based hunting, trapping, and gathering sites that are accessed by boat from the pilot station at Sand Heads to the 12 nm territorial limit.

To mitigate potential impacts to Tsartlip First Nation's right to hunt, trap and gather, the EAO is recommending a KMM under CEAA 2012 for a Marine Communication Plan, including procedures to inform Indigenous Groups of traffic schedules and for Indigenous Groups to submit any feedback on potential adverse effects on navigation as a result of TMJ. The EAO also

considered that the small relative increase due to TMJ-related vessel traffic would have a negligible effect to experiential aspects of hunting, trapping, and gathering from changes to visual quality and noise in the MSA and that all TMJ related vessels would adhere to the Marine Regulations and Legislation regulating vessel noise and lighting.

C. POTENTIAL IMPACTS ON OTHER TRADITIONAL AND CULTURAL INTERESTS

The EAO evaluated the potential for TMJ-related residual and cumulative effects to impact other traditional and cultural interests of Indigenous Groups in the MSA, as summarized in Section 13.3.3. In its evaluation, the EAO considered potential marine-shipping related effects pathways to impacts based on review of publicly available information from RBT2 and TMX processes, and any information provided by Indigenous Groups during the MSA review. The EAO is satisfied that TMJ's marine shipping-related effects in the MSA area to access, quality of experience and SRKWs would be the pathways to impacts to Tsartlip First Nation's other cultural and traditional interests.

The EAO notes that the RBT2 process included information that Tsartlip First Nation reported traditional knowledge of travel routes by canoe across the shipping lanes from the Saanich Peninsula to the Tsartlip First Nation settlements and traditional use sites throughout the southern Gulf and San Juan Islands. The MSA reported on preferred travel routes to access salmon fishing locations at Stuart Island and southwest of San Juan Island by travelling directly east from the Saanich Peninsula across the international border. The MSA noted that Tsartlip First Nation has raised concerns about the impacts from shipping lanes and the exclusion effects of larger vessels on smaller ones, in addition to impacts for noise, odours and wake effects. Tsartlip First Nation has reported the presence of important sites (e.g., burial sites, midden sites and village sites) throughout the Gulf Islands and some locations in the USA, including San Juan Island and a shore camp at Point Roberts.

Additional issues and concerns with potential impacts related to traditional and cultural interest were raised by Tsartlip First Nation during the EAs of RBT2 and TMX. These concerns were not raised by Tsartlip First Nation during the TMJ EA but the EAO considers them applicable to the MSA area.

- Expressed concern that any impacts to SRKWs would adversely affect the entire valued ecosystem of Tsartlip. SRKWs are an integral part of Tsartlip First Nation's customs, practices, traditions, and spirituality. Concerns that the potential mitigation measure to reduce impacts on SRKWs (slowing down vessels) may lead to vessels spending additional time in the shipping lanes and increasing the time that fishing and harvesting rights are impacted.
    - See Section 13.2.3 for a detailed discussion of the analysis and resolution of

concerns related to the effects on whales. As discussed in Section 13.2.3, the EAO concluded that TMJ would not result in significant residual effects to Marine Mammals; however, the EAO notes that the current baseline of cumulative effects to SRKWs are already high and that TMJ would contribute additional residual effects from shipping noise and potential avoidance behaviour by SRKWs to ships, such that cumulative effects to SRKWs are considered significant. The is EAO recommending a KMM under CEAA 2012 the Vessel Traffic Management Plan that would require TJLP to incorporate contractual measures to support participation of TMJ-related vessels in the VFPA-led ECHO Program seasonal slowdown initiatives (as amended) or a future equivalent, and annual reporting on TJLP's participation in regional environmental management measures and cumulative effects monitoring to protect SRKW, where feasible. The seasonal slowdown initiatives currently request vessels to slow down in key SRKW foraging areas such as Swiftsure Banks, Haro Strait and Boundary Pass. The EAO also notes several regional initiatives and measures have been implemented by the Government of Canada to better understand and manage cumulative effects on the recovery of SRKWs (listed in Section 13.1.1).

- Concerned about cumulative effects of increased shipping traffic and vessel size due to multiple projects in the area. Ability to practice rights is already restricted due to traffic and pollution.
    - As outlined in the Current Use assessment in Part B, potential negligible to low magnitude impacts to the experiential aspect of fishing in the MSA due to TMJ-related vessel traffic and potential concerns regarding safety regularly occurring vessels transits during the operations for Indigenous Groups who harvest fish in, or in proximity to, the navigational channel or shipping lanes, or those who need to cross these areas to access fishing resources.
    - The EAO acknowledges Tsartlip First Nation's worldview and perspective that there are currently existing cumulative effects which have already affected Tsartlip First Nation's ability to exercise their fishing rights as preferred within Tsartlip First Nation's asserted traditional territory.
    - The EAO is recommending as a KMM under CEAA 2012 a Marine Communication Plan out to 12 nm that would be developed in consultation with Schedule B and D Indigenous Groups and include procedures to inform Indigenous Groups of traffic schedules, for Indigenous Groups to submit any feedback on potential adverse effects of TMJ-related vessels and for TJLP to respond in a timely manner.

- Concern about the potential impact of wake on archaeological sites located on exposed shorelines. Establishing effective shore-based monitoring would require years of planning effort, baseline data, and training to prepare for meaningful monitoring and mitigation of adverse effects.
    - The EAO concluded that TMJ-related vessel wake would be within natural variation of the wave heights in this area (see the Vessel Wake section of this Report (Section 5.4)). The EAO did not find any adverse residual effects to heritage resources in the MSA area.
- Concerned that light pollution, sound, odours, and the appearance of increasing large vessels would adversely affect the psycho-social and cultural well-being of Tsartlip First Nation members
    - The EAO acknowledges that TMJ vessels would be larger the closer one is to the vessel and that the presence of LNG carriers may be considered disturbing by Indigenous people for safety and/or aesthetic reasons, or for other reasons.

The EAO heard from Tsartlip First Nation concern that TMJ will have cumulative and negative impacts (both direct and indirect) to Tsartlip's Aboriginal Interests and that these impacts, particularly those affecting fish and fish habitat, the SRKWs, and human health, would further impair the ability of Tsartlip members to practice their constitutionally protected Aboriginal and Douglas Treaty rights in and around the Project area and throughout Tsartlip's marine territories.

Conclusion

The EAO predicts the TMJ-related marine shipping effects alone would have **negligible-to-minor** impacts on Tsartlip First Nation's other cultural and traditional interests, although the EAO acknowledges that there is uncertainty in the relationship between incremental increases in shipping and the availability of cultural resources, such as SRKW. However, in consideration of the available information, the EAO's consultation with Tsartlip First Nation, TJLP's commitments, the EAO's proposed EAC conditions if an EAC is issued and the recommended KMMs under CEAA 2012, the EAO concludes that TMJ-related marine shipping effects combined with cumulative effects in the MSA area is expected to result in moderate-to-serious impact on Tsartlip First Nation's other traditional and cultural interests. The EAO's conclusions of significant cumulative effects to SRKW was a major key factor considered in the EAO's seriousness determination. The EAO notes several regional initiatives and measures have been implemented by the Government of Canada to better understand and manage cumulative effects on the recovery of SRKWs (listed in Section 13.1.1).

The key factors that were considered in support of EAO's conclusion on the impacts to other traditional and cultural interests are summarized as follows:

Cultural and Heritage Resources:

- The EAO's conclusions in Part B did not predict residual effects to Heritage Resources (Section 7.1) from erosion due to wake effects along the shorelines of the MSA area;
- The EAO's conclusions in the Marine Mammals section in Part B, which found low to moderate magnitude residual effects from TMJ-related vessels on SRKWs and significant cumulative effects to SRKWs due to underwater noise;
- Tsartlip First Nation consider that TMJ will have cumulative and negative impacts (both direct and indirect) to SRKW and human health would further impair the ability of Tsartlip members to practice their Aboriginal and Douglas Treaty rights in and around the Project area and throughout Tsartlip's marine territories; and
- The MSA area is a heavily utilized marine environment.

Geospatial:

- Tsartlip use travel routes across the shipping lanes from the Saanich Peninsula to the Tsartlip First Nation settlements and traditional use sites throughout the southern Gulf and San Juan Islands; and
- The EAO considers TMJ would result in an incremental increase (i.e., 0.2 – 1.1 % for segments A – D) to vessel traffic when compared to baseline conditions in the Traffic Separation Scheme and would result in negligible to low magnitude effects due to relatively infrequent and short-duration interruptions to access to areas in the Salish Sea.

Social, Cultural, Experiential:

- Potential negligible to low impacts due to incremental increases from TMJ-related vessel traffic during operations affecting visual quality, noise, and vessel wake (with an increasing magnitude of effect the closer one is to the vessels);
- Potential concerns regarding safety of small vessels with large vessels and wake effects, as assessed in the Accidents and Malfunctions and Effects of the Environment section in Part B;
- Psycho-social and cultural well-being of Tsartlip First Nation members vulnerable to marine shipping related safety concerns and effects on quality of experience; and
- Tsartlip Indian Band's cultural and spiritual interest in SRKWs.

Mitigations:

- Proposed mitigations for potential impacts to traditional and cultural interests are the recommended key mitigations under CEAA 2012 for a Marine Communications, and Vessel Traffic Management Plans, and a Marine Shipping Emergency Response Outreach Program;
- The EAO is recommending as KMMs under CEAA 2012 for a Vessel Traffic Management Plan that would require TJLP to incorporate contractual measures to support participation of TMJ-related vessels in the VFPA-led ECHO Program seasonal slowdown initiatives (as amended) or a future equivalent, and annual reporting on TJLP's participation in regional environmental management measures and cumulative effects monitoring to protect SRKW, where feasible. The seasonal slowdown initiatives currently request vessels to slow down in key SRKW foraging areas such as Swiftsure Banks, Haro Strait and Boundary Pass; and
- The EAO acknowledges that these mitigation measures would not reduce impacts for baseline conditions and/ or impact of future projects, which are a source of issues for many Indigenous Groups.

16.10 TSEYCUM FIRST NATION

16.10.1 COMMUNITY PROFILE

W̱ SI KEM (Tseycum) First Nation is one of the Indigenous Groups that constitute the W̱SÁNEĆ (Saanich) people, Malahat Nation which are a Coast Salish cultural group of people that has occupied the Strait of Georgia continuously for thousands of years. Tseycum is located on the northwest side of the Saanich Peninsula on Vancouver Island, adjacent to the Saanich Inlet and has five reserves. As of February 2022, Tseycum has a registered population of 204 with 81 living on Tseycum reserves, 76 living off-reserve, and 47 living on other reserves[376].

Before contact, the W̱SÁNEĆ Nations were a single group of extended families sharing the SENĆOŦEN language and a cultural order revolving around their relations with marine creatures, spirit beings, and one another. The relationship of the W̱SÁNEĆ with their marine environment drives their society, economy, culture, and identity.

[376] Indigenous and Northern Affairs Canada. 2022. First Nation Profiles – Tseycum. https://fnp-ppn.aadnc-aandc.gc.ca/fnp/Main/Search/FNRegPopulation.aspx?BAND_NUMBER=655&lang=eng, Accessed March 23, 2022.

XWSANETS (Saanich Peninsula) is the "homebase" of the W̱SÁNEĆ. It derives its name from the image presented to paddlers in a canoe as they approach from the water, meaning "raised up" or "emerging people." The naming practice based on the perspective of the water reveals the fundamental nature of marine territory to the W̱SÁNEĆ worldview.

W̱SÁNEĆ families had permanent winter settlements on the Saanich Peninsula and temporary settlements throughout the San Juan and southern Gulf Islands and across the Salish Sea to Point Roberts and Boundary Bay. This territory is defined by the pursuit of the five salmon species and steelhead and is where the W̱SÁNEĆ assert continuous and exclusive use and occupation since time immemorial. The 1987 Saanich Declaration describes W̱SÁNEĆ territory as "[encompassing] all [their] Spiritual Places, medicine and fruit gathering places, fishing stations, hunting and trapping areas, winter and summer homesites, burial sites, meditation places and all our territories in between these places." W̱SÁNEĆ families exploited different ecological niches, had tailored seasonal movements, and shared resources with each other. The W̱SÁNEĆ reciprocal system of sharing marine resources and associated knowledge is key to self-actualization and creating an autonomous future. The W̱SÁNEĆ had reef net fishing sites throughout their territory, with the Nation's largest reef net claim at Point Roberts and another on ŚNEWIŁ (the Fraser River).

The W̱SÁNEĆ signed the Douglas Treaty (1852) during an apparent time of escalating tension between the W̱SÁNEĆ. The W̱SÁNEĆ therefore viewed the treaty as a peaceful agreement between two nations that would ensure the continuation of the W̱SÁNEĆ fisheries, lifestyle, culture, resource management, and governance systems as formerly.

16.10.2 POTENTIAL IMPACTS TO TREATY RIGHTS AND OTHER INTERESTS

The following sections focus on potential impacts of TMJ to Tseycum First Nation's Douglas Treaty rights and other interests. A discussion of the EAO's assessment approach is provided in Impact Assessment Methods of Part C (Section 12.2).

The EAO considered information available, including from public sources. The EAO reached out to Tseycum First Nation regarding potential effects on its Douglas Treaty rights and other interests but did not receive a response.

The following sections focus on potential impacts of TMJ to Tseycum First Nation's Douglas Treaty rights to hunt and fish and other interests, mitigations and accommodations to address potential impacts.

A. POTENTIAL IMPACTS ON FISHING

The EAO evaluated the potential effects of TMJ on Aboriginal fishing rights and provided a summary in Section 13.3.1. In addition, the EAO considered relevant information related to the potential shipping-related effects based on review of RBT2 and TMX processes. The EAO is satisfied that the key impacts to biophysical components resulting in changes to fish quantity and quality, changes in access to fishing resources, and changes to social, cultural, and spiritual values associate with traditional fishing activities that apply to Tseycum First Nation are summarized in Section 13.3.1.

The MSA noted that Tseycum First Nation currently engage in both FSC and commercial fisheries in the MSA Area. The MSA reported on marine harvesting and fishing locations throughout the Tseycum First Nation territory, including Cowichan Bay, Southern Gulf Islands and Island in the USA. Tseycum First Nation noted that many of its fishers travelled in the shipping lanes.

Additional issues and concerns with potential impacts related to fishing were raised by Tseycum First Nation during the EAs of RBT2 and TMX. These concerns were not raised by Tseycum First Nation during the TMJ EA but the EAO considers them applicable to the MSA area.

- Concerns regarding potential effect on salmon, salmon habitat, the ability to harvest them, and overall impacts to fishing rights
    - As discussed in Section 13.3.1, the EAO is recommending KMMs under CEAA 2012 for the Fish Mitigations to Reduce Harm and Mortality, Fish Habitat Offset Plan, and Vessel Traffic Management Plan to address these concerns. The EAO did not predict any residual effects to fish and fish habitat in the MSA area.
    - In the Current Use section of this Report, the EAO predicted relatively infrequent and short-duration TMJ-related vessel transits would have negligible to low magnitude effects to access to harvesting sites in the MSA area. TJLP has stated that TMJ's influence on TMJ-related vessel operations would be, TJLP has committed a Marine Communication Plan out to 12 nm that would be developed in consultation with Schedule B and D Indigenous Groups and include procedures to inform Indigenous Groups of traffic schedules, for Indigenous Groups to provide feedback on adverse effects related to navigation as a result of TMJ, and for TJLP to document and respond to feedback in a timely manner.

Conclusion

In consideration of the available information, the EAO's consultation with Tseycum First Nation, TJLP's commitments, the EAO's proposed EAC conditions if an EAC is issued and the recommended KMMs under CEAA 2012, TMJ is expected to result in **negligible-to-minor** impact

on Tseycum First Nation's right to fish. The EAO considers TMJ-related increases to vessel traffic during operations would be incremental compared to existing baseline conditions in the Traffic Separation Scheme of the Salish Sea.

The key factors that were considered in support of the EAO's conclusion on the impacts to the right to fish are summarized as follows:

Biophysical:

- The EAO's conclusions on adverse residual effects in the Fish and Fish Habitat chapter in Part B which does not predict any residual effects to fish and fish habitat in the MSA area.

Geospatial:

- Tseycum First Nation harvests marine invertebrates and fishes throughout the MSA area including in areas near to, or requiring crossing of, the shipping lanes;
- The EAO considers TMJ would result in an incremental increase (i.e., 0.2 – 1.1 percent for segments A – D) in vessel traffic when compared to baseline conditions in the Traffic Separation Scheme of the Salish Sea; and
- The EAO's conclusions in the Current Use of Part B that TMJ-related vessel transits during operations (minimum 30 years) would result in negligible to low magnitude effects due to relatively infrequent and short-duration interruptions to access to areas in the Salish Sea.

Social, Cultural and Experiential:

- Potential negligible to low impacts due to incremental increases from TMJ-related vessel traffic during operations affecting visual quality, noise, and vessel wake (with an increasing magnitude of effect the closer one is to the vessels); and
- Potential concerns regarding safety of small vessels with large vessels and wake effects, as assessed in the Accidents and Malfunctions and Effects of the Environment section in Part B.

Mitigations:

- Proposed mitigations for impacts to Tseycum First Nation's right to fish include the Marine Communications Plan recommended as KMMs under CEAA 2012.

B. POTENTIAL IMPACTS ON HUNTING, TRAPPING AND GATHERING

The EAO evaluated the potential effects on hunting, trapping, and gathering activities attributable to TMJ in Section 13.3.2. The EAO is satisfied that the key impacts to biophysical

components resulting in changes to wildlife and vegetation quantity and quality, changes in access to hunting, trapping and gathering areas, and changes to social, cultural, and spiritual values associated with traditional hunting, trapping and gathering activities that apply to Tseycum First Nation are summarized in Section 13.3.2.

Conclusion

In consideration of the available information in Section 13.2.2, which outlines the potential effect to hunting, trapping and gathering, TJLP's commitments, the EAO's proposed EAC conditions if an EAC is issued and the recommended KMMs under CEAA 2012, TMJ is expected to result in **negligible** impact on Tseycum First Nation's hunting, trapping and gathering.

The key factors that were considered in support of the EAO's conclusion on the impacts to the right to hunt, trap and gather included the EAO's conclusions on adverse residual effects to wildlife in the MSA area predict negligible to low magnitude mortality of select marine bird species. The EAO also considered that in the MSA area, operations (30 years in duration) may cause infrequent, short-term, temporary disruptions to marine-based hunting along the proposed LNG vessel route and negligible effects on Indigenous access to terrestrially based hunting, trapping, and gathering sites that are accessed by boat from the pilot station at Sand Heads to the 12 nm territorial limit.

To mitigate potential impacts to Tseycum First Nation's right to hunt, trap and gather, the EAO is recommending a KMM under CEAA 2012 for a Marine Communication Plan, including procedures to inform Indigenous Groups of traffic schedules and for Indigenous Groups to submit any feedback on potential adverse effects on navigation as a result of TMJ. The EAO also considered that the small relative increase due to TMJ-related vessel traffic would have a negligible effect to experiential aspects of hunting, trapping, and gathering from changes to visual quality and noise in the MSA and that all TMJ related vessels would adhere to the Marine Regulations and Legislation regulating vessel noise and lighting.

C. POTENTIAL IMPACTS ON OTHER TRADITIONAL AND CULTURAL INTERESTS

The EAO evaluated the potential for TMJ-related residual and cumulative effects to impact other traditional and cultural interests of Indigenous Groups in the MSA, as summarized in Section 13.3.3. In its evaluation, the EAO considered potential marine-shipping related effects pathways to impacts based on review of publicly available information from RBT2 and TMX processes, and any information provided by Indigenous Groups during the MSA review. The EAO is satisfied that TMJ's marine shipping-related effects in the MSA area to access, quality of experience and SRKWs would be the pathways to impacts to Tseycum First Nation's other cultural and traditional interests.

Additional issues and concerns related to traditional and cultural interests were raised by Tseycum First Nation during the EA of RBT2, including the importance of not disturbing critical habitat for SRKWs and concerns for impact of large vessels on the SRKWs, given the importance of SRKWs to the W̱SÁNEĆ culture. Although, these concerns were not raised by Tseycum First Nation during the TMJ EAO, the EAO considers them applicable to the MSA area.

- See Section 13.3.3 for a detailed discussion of the analysis and resolution of concerns related to the effects on whales. As discussed in Section 13.3.3, the EAO concluded that TMJ would not result in significant residual effects to Marine Mammals; however, the EAO notes that the current baseline of cumulative effects to SRKWs are already high and that TMJ would contribute additional residual effects from shipping noise and potential avoidance behaviour by SRKWs to ships, such that cumulative effects to SRKWs are considered significant; and
- The is EAO recommending a KMM under CEAA 2012 the Vessel Traffic Management Plan that would require TJLP to incorporate contractual measures to support participation of TMJ-related vessels in the VFPA-led ECHO Program seasonal slowdown initiatives (as amended) or a future equivalent, and annual reporting on TJLP's participation in regional environmental management measures and cumulative effects monitoring to protect SRKW, where feasible. The seasonal slowdown initiatives currently request vessels to slow down in key SRKW foraging areas such as Swiftsure Banks, Haro Strait and Boundary Pass. The EAO also notes several regional initiatives and measures have been implemented by the Government of Canada to better understand and manage cumulative effects on the recovery of SRKWs (listed in Section 13.1.1).

The MSA noted that cumulative impacts to traditional marine resources have removed the opportunities for Tseycum First Nation to engage in cultural activities including intergenerational knowledge transfer. The MSA reported that Tseycum First Nation has a host of cultural sites in the MSA area including villages and burial grounds in the southern Gulf Islands and in the USA. (e.g., at Henry, Pearl and San Juan Islands).

- The EAO acknowledges Tseycum First Nation's worldview and perspective that there are currently existing cumulative effects which have already affected Tseycum member's ability to exercise their fishing rights as preferred within Tseycum First Nation's asserted traditional territory; and
- As outlined in the Current Use assessment in Part B, potential negligible to low magnitude impacts to the experiential aspect of fishing in the MSA due to TMJ-related vessel traffic and potential concerns regarding safety regularly occurring vessels transits during the operations for Indigenous Groups who harvest fish in, or in proximity to, the

navigational channel or shipping lanes, or those who need to cross these areas to access fishing resources.

Conclusion

The EAO predicts the TMJ-related marine shipping effects alone would have **negligible-to-minor** impacts on Tseycum First Nation's other cultural and traditional interests, although the EAO acknowledges that there is uncertainty in the relationship between incremental increases in shipping and the availability of cultural resources, such as SRKW. However, in consideration of the available information, the EAO's consultation with Tseycum First Nation, TJLP's commitments, the EAO's proposed EAC conditions if an EAC is issued and the recommended KMMs under CEAA 2012, the EAO concludes that TMJ-related marine shipping effects combined with cumulative effects in the MSA area is expected to result in **moderate-to-serious** impact on Tseycum First Nation's other traditional and cultural interests. The EAO's conclusions of significant cumulative effects to SRKW was a major key factor considered in the EAO's seriousness determination. The EAO notes several regional initiatives and measures have been implemented by the Government of Canada to better understand and manage cumulative effects on the recovery of SRKWs (listed in Section 13.1.1).

The key factors that were considered in support of the EAO's conclusion on the impacts to other traditional and cultural interests are summarized as follows:

Cultural and Heritage Resources:

- The EAO's conclusions in Part B found no residual effects to Heritage Resources (Section 7.1) from erosion due to wake effects along the shorelines of the MSA area;
- The EAO's conclusions in the Marine Mammals section in Part B, which found low to moderate magnitude residual effects from TMJ-related vessels on SRKWs and significant cumulative effects to SRKWs; and
- The MSA area is a heavily utilized marine environment.

Geospatial:

- Tseycum First Nation has a host of cultural sites in the MSA area including villages and burial grounds in the southern Gulf Islands and in the USA (e.g., at Henry, Pearl and San Juan Islands), which would require crossing the shipping lanes.

The EAO considers TMJ would result in an incremental increase (i.e., 0.2 – 1.1 % for segments A – D) to vessel traffic when compared to baseline conditions in the Traffic Separation Scheme and would result in negligible to low magnitude effects due to relatively infrequent and short-duration interruptions to access to areas in the Salish Sea.

Social, Cultural, Experiential:

- Potential negligible to low impacts due to incremental increases from TMJ-related vessel traffic during operations affecting visual quality, noise, and vessel wake (with an increasing magnitude of effect the closer one is to the vessels); and
- Potential concerns regarding safety of small vessels with large vessels and wake effects, as assessed in the Accidents and Malfunctions (Section 9) and Effects of the Environment (Section 10) sections in Part B.

Mitigations:

- Proposed mitigations for potential impacts to traditional and cultural interests are the recommended key mitigations under CEAA 2012 for Marine Communications and Vessel Traffic Management Plans and Marine Shipping Emergency Response Outreach Program;
- The EAO is recommending as KMMs under CEAA 2012 for a Vessel Traffic Management Plan that would require TJLP to incorporate contractual measures to support participation of TMJ-related vessels in the VFPA-led ECHO Program seasonal slowdown initiatives (as amended) or a future equivalent, and annual reporting on TJLP's participation in regional environmental management measures and cumulative effects monitoring to protect SRKW, where feasible. The seasonal slowdown initiatives currently request vessels to slow down in key SRKW foraging areas such as Swiftsure Banks, Haro Strait and Boundary Pass; and
- The EAO acknowledges that these mitigation measures would not reduce impacts for baseline conditions and/ or impact of future projects, which are a source of issues for many Indigenous Groups.

16.11 SONGHEES NATION

16.11.1 COMMUNITY PROFILE

Songhees Nation are descended from the Lək̓ʷəŋən (*Lekwungen)* speaking people identified as Coast Salish. Songhees Nation has four reserves, and as of February 2022 has a registered population of 638 people of which 351 live on Songhees Nation reserves, 244 live off-reserve,

and 43 live on other reserves[377]. Songhees Nation is part of the Te'mexw Treaty Association, along with Scia'new (Beecher Bay) First Nation, Snaw-Naw-As (Nanoose First Nation), Malahat Nation, and T'Sou-ke First Nation, which is operating within the final phases of the modern treaty process (Stage 5).

Tl'ches, an area of great cultural importance to Songhees Nation, is an archipelago located a few km off Oak Bay in the Strait of Juan de Fuca and encompasses what are also known as the Chatham Islands and Discovery Island. Two of Songhees Nation's reserves are located at *Tl'ches*. Songhees Nation speaks *Lekwungen*, considered part of the Northern Straits Salish language family. In 1850, the *Lekwungen* entered into Treaties with James Douglas. Songhees Nation has Douglas Treaty rights to hunt over unoccupied lands and to carry on their fisheries "as formerly".

Songhees Nation members have used and continue to use Songhees Territory for a variety of purposes including hunting, fishing, trapping, gathering, camping, spiritual practices, and ceremony. The practices conducted on Songhees lands and waters have been integral to Songhees's physical and cultural survival and are critical for ensuring the meaningful exercise of rights and the ability to pass on Songhees culture to future generations. Prior to and after contact, Songhees members traditionally harvested all types of seafood and fish and traded it with other Indigenous groups in the area and continued to trade with European settlers, once they arrived.

Traditionally, each *Lekwungen* household consisted of extended families who held areas in which they could hunt, fish, collect plants, and build houses. Other areas were shared as common amongst the different household groups. Historically, Songhees collected marine life including many kinds of fish like Coho and spring salmon, Pacific halibut, herring, sea cucumber, sea urchins (green, red and purple), seaweed, Dungeness crab, clams, octopus, seals and much more. They would harvest berries, fruit from trees, and bark for teas. They would hunt a variety of species including deer and rabbit.

Although *Tl'ches* includes several islands, translated from *Lekwungen*, the word *Tl'ches* means "one island." *Tl'ches* has great cultural significance as it was once the site of a Songhees village and contains middens, burial cairns and other sacred cultural sites. It is also one of the few remaining places where Songhees members can experience their territory mostly undisturbed by the extensive development of the Greater Victoria Area. Some members continue to use the area for Camas bulb harvesting, gathering of medicinal plants, fishing, and other culturally

[377] Indigenous and Northern Affairs Canada. 2022. First Nation Profiles – Songhees Nation. https://fnp-ppn.aadnc-aandc.gc.ca/fnp/Main/Search/FNRegPopulation.aspx?BAND_NUMBER=656&lang=eng, Accessed March 23, 2022.

significant activities. *Tl'ches* is also home to vital kelp forests and eel grass beds, which provide shelter, habitat and protection for species that are culturally significant to Songhees.

Culturally important species to Songhees include abalone, rockfish, rock scallop, lingcod, salmon, herring, urchins, clams, cockles, mussels, oysters, harbour seals, river otter and sea otter. The SRKW is the subject of Songhees legends, art, and cultural practices. It is a sacred animal to the Songhees.

A Songhees village was originally located at *Tl'ches* and there are 34 additional recorded coastal archaeological sites at *Tl'ches*. Other unrecorded sites also exist. The intertidal zone has a very high potential for undisturbed archaeological deposits, some of which show exceptional preservation.

16.11.2 SONGHEES NATION INVOLVEMENT IN THE CONSULTATION PROCESS

Consultation with Indigenous groups identified in Schedule D began in July of 2019 when EAO sent a letter to these groups inviting comments on the draft Section 13 Order, including consultation processes and opportunities.

On August 6, 2019, at the request of Canada, the EAO under the Section 13 Order amended the geographic scope for the assessment of the marine shipping route and added the Indigenous groups identified in Schedule D which included the Songhees Nation. For the review of the MSA, the EAO led consultation activities with the Indigenous groups identified in Schedule D and, as part of this work, invited Songhees Nation to participate in the Marine Shipping Working Group. The EAO is of the view that it has approached consultation with Songhees Nation at the deeper end of the spectrum, with the intent to identify potential impacts and consider ways to address potential impacts to Aboriginal Interests that were identified by Songhees Nation with in the MSA area.

During the MSA review, the EAO invited the Songhees Nation to review and provide comments on TJLP's MSA Supplemental Analysis, the EAO's draft Assessment Report (including Part C of the Assessment Report), the draft CPD, draft provincial Certificate Conditions and draft recommended KMMs under CEAA 2012. As part of the Marine Shipping Working Group, the Songhees Nation was invited to participate in Marine Shipping Working Group meetings during the MSA Supplemental Analysis Review stages.

The EAO offered to meet directly with the Songhees Nation to discuss TMJ, EA process, and any potential concerns with TMJ.

16.11.3 POTENTIAL IMPACTS TO TREATY RIGHTS AND OTHER INTERESTS

The following sections focus on potential impacts of TMJ to Songhees Nation's Aboriginal Interests and Douglas Treaty rights to hunt and fish. A discussion of the EAO's assessment approach is provided in Section 12.2 Impact Assessment Methods of this Report.

The EAO considered information available, including from public sources. The EAO reached out to Songhees Nation regarding potential effects on Douglas Treaty rights and other interests but did not receive a response.

The following sections focus on potential impacts of TMJ to Songhees Nation's Douglas Treaty rights to right to fish and hunt and other interests, mitigations, and accommodations to address potential impacts.

A. POTENTIAL IMPACTS ON FISHING

The EAO evaluated the potential effects of TMJ on Aboriginal fishing rights and provided a summary in Section 13.3.1. In addition, the EAO considered relevant information related to the potential shipping-related effects based on review of RBT2 and the TMX processes. The EAO is satisfied that the key impacts to biophysical components resulting in changes to fish quantity and quality, changes in access to fishing resources, and changes to social, cultural, and spiritual values associate with traditional fishing activities that apply to Songhees Nation are summarized in Section 13.3.1.

The specific issues and concerns with potential impacts related to fishing, based on RBT2 and TMX are provided below. While these concerns were not specifically raised by Songhees Nation during the TMJ EA, the EAO considered them applicable to the MSA area.

- Concerns about increase in vessel traffic and/or vessel size and the potential adverse impacts to the ability of Songhees members to Treaty rights and other interests. Main shipping lanes overlap preferred harvesting areas. Concern about safety of smaller boats in high traffic areas, and the potential for collisions and accidents.
    - In the Current Use section of this Report, the EAO predicted that regularly occurring and short-duration TMJ-related vessel transits would have negligible to low magnitude effects to access to harvesting sites in the MSA area. The EAO is recommending a KMM under CEAA 2012 for a Marine Communication Plan out to 12 nm that would be developed in consultation with Schedule B and D Indigenous Groups and include procedures to inform Indigenous Groups of traffic schedules, for Indigenous Groups to provide feedback on adverse effects related to navigation as a result of TMJ, and for TJLP to document and respond to feedback in a timely manner.
    - Marine shipping associated with TMJ would be required to meet the

international standards and Canadian regulations set out by Canada's compliance-based marine safety and security system, which is designed to protect life, property, and the marine environment. The EAO is recommending a KMM under CEAA 2012 for a Marine Shipping Emergency Response Outreach Program to facilitate the integration of plans for responding to incidents in transit into existing emergency response systems, primarily the CCG's Incident Integrated Response Plans.

- Concern about potential impacts to plants and animals found in the marine environments, potential for pollution to contaminate food sources, or a spill that could impacts Songhees abilities members abilities to harvest, gather and exercise other rights.
    - As discussed in Section 13.3.1, the EAO is recommending KMMs under CEAA 2012 for the Fish Mitigations to Reduce Harm and Mortality, Fish Habitat Offset Plan, and Vessel Traffic Management Plan to address these concerns. The EAO did not predict any residual effects to fish and fish habitat in the MSA area.
    - As discussed in the Accidents and Malfunctions and Effects of the Environment section of Part B, vessels would be required to comply with internationally recognized safety standards that include pollution prevention from ships, including Canada's Ballast Water Regulations.
    - TJLP has stated that TMJ's influence on TMJ-related vessel operations would be limited beyond TMJ's marine terminal area, but TJLP is committed to developing a Marine Shipping Emergency Response Outreach Program that would facilitate the integration of plans for responding to incidents in transit into existing emergency response systems, primarily the CCG's Incident Integrated Response Plans.

Conclusion

In consideration of the available information, the EAO's consultation with Songhees Nation, TJLP's commitments, and the EAO's proposed EAC conditions if an EAC is issued and the recommended KMMs under CEAA 2012, TMJ is expected to result in **negligible-to-minor** impact on Songhees Nation's right to fish. The EAO considers TMJ-related increases to vessel traffic during operations would be incremental compared to existing baseline conditions in the Traffic Separation Scheme of the Salish Sea.

The key factors that were considered in support of the EAO's conclusion on the impacts to the right to fish are summarized as follows:

Biophysical:

- The EAO's conclusions on adverse residual effects in the Fish and Fish Habitat chapter in Part B which does not predict any residual effects to fish and fish habitat in the MSA area.

Geospatial:

- Songhees Nation identified through the RBT2 and TMX process that the main shipping lanes overlap preferred harvesting areas;
- The EAO considers TMJ would result in an incremental increase (i.e., 0.2 – 1.1 percent for segments A – D) in vessel traffic when compared to baseline conditions in the Traffic Separation Scheme of the Salish Sea; and
- The EAO's conclusions in the Current Use of Part B that TMJ-related vessel transits during operations (minimum 30 years) would result in negligible to low magnitude effects due to relatively infrequent and short-duration interruptions to access to areas in the Salish Sea.

Social, Cultural and Experiential:

- Negligible to low impacts due to incremental increases from TMJ-related vessel traffic during operations affecting visual quality, noise, and vessel wake (with an increasing magnitude of effect the closer one is to the vessels); and
- Concern about safety of smaller boats in high traffic areas, and the potential for collisions and accidents.

Mitigations:

- Proposed mitigations for impacts to Songhees Nation's right to fish include the Marine Communications Plan recommended as KMMs under CEAA 2012.

B. POTENTIAL IMPACTS ON HUNTING, TRAPPING AND GATHERING

The EAO evaluated the potential effects on hunting, trapping, and gathering activities attributable to TMJ which apply broadly to Indigenous Groups. These potential effects are summarized in Section 13.3.2. The EAO is satisfied that the key impacts to biophysical components resulting in changes to wildlife and vegetation quantity and quality, changes in access to hunting, trapping and gathering areas, and changes to social, cultural, and spiritual values associated with traditional hunting, trapping and gathering activities that apply to Songhees Nation are summarized in Section 13.3.2.

Additional issues and concerns with potential impacts related to hunting, trapping, and gathering were raised by Songhees Nation during the EAs of RBT2 and TMX. These concerns were not raised by Songhees Nation during the TMJ EA but the EAO considers them applicable to the MSA area.

- Concerned about cumulative effects on wildlife, vegetation, and the exercise of rights and the attendant socio-economic effects on Songhees members.
    - In Part B of this Report the EAO predicted the only residual effect to wildlife in the MSA area would be potential negligible to low magnitude mortality of select marine bird species. The EAO did not predict cumulative effects to mortality of marine bird species due to TMJ-related vessel traffic.
    - The EAO considered that TMJ-related marine shipping in the MSA area may cause infrequent, short-term, temporary disruptions predicted to result in negligible effects on Indigenous access to terrestrially based gathering sites that are accessed by boat from the pilot station at Sand Heads to the 12 nm territorial limit.

Conclusion

In consideration of the available information, the EAO's consultation with Songhees Nation, TJLP's commitments, and the EAO's proposed EAC conditions if an EAC is issued and the recommended KMMs under CEAA 2012, TMJ is expected to result in **negligible** impact on Songhees Nation's hunting, trapping, and gathering.

The key factors that were considered in support of the EAO's conclusion on the impacts to the right to hunt, trap, and gather included the EAO's conclusions on adverse residual effects to wildlife in the MSA area predict negligible to low magnitude mortality of select marine bird species. The EAO also considered that in the MSA area, operations (30 years in duration) may cause infrequent, short-term, temporary disruptions to marine-based hunting along the proposed LNG vessel route and negligible effects on Indigenous access to terrestrially based hunting, trapping, and gathering sites that are accessed by boat from the pilot station at Sand Heads to the 12 nm territorial limit.

To mitigate potential impacts to Songhees Nation's right to hunt, trap and gather, the EAO is recommending a KMM under CEAA 2012 for a Marine Communication Plan, including procedures to inform Indigenous Groups of traffic schedules and for Indigenous Groups to submit any feedback on potential adverse effects on navigation as a result of TMJ. The EAO also considered that the small relative increase due to TMJ-related vessel traffic would have a negligible effect to experiential aspects of hunting, trapping, and gathering from changes to

visual quality and noise in the MSA and that all TMJ related vessels would adhere to the Marine Regulations and Legislation regulating vessel noise and lighting.

C. POTENTIAL IMPACTS ON OTHER TRADITIONAL AND CULTURAL INTERESTS

The EAO evaluated the potential for TMJ-related residual and cumulative effects to impact other traditional and cultural interests of Indigenous Groups in the MSA, as summarized in Section 13.3.3. In its evaluation, the EAO considered potential marine-shipping related effects pathways to impacts based on review of publicly available information from RBT2 and TMX processes, and any information provided by Indigenous Groups during the MSA review. The EAO is satisfied that TMJ's marine shipping-related effects in the MSA area to access, quality of experience and SRKWs would be the pathways to impacts to Songhees Nation's other cultural and traditional interests.

The MSA reported that *Tl'ches* is an important Songhees village site that contains middens, burial cairns, and other cultural sites. Songhees Nation members currently use *Tl'ches* for various traditional harvesting, gathering and cultural activities. The MSA noted that Songhees Nation has raised concerns about cumulative impacts at *Tl'ches* due to development over the past 200 years. Songhees Nation created a Marine Use Plan including a protective zone around *Tl'ches*. The RBT2 Panel Report (2020) noted that the outbound shipping route passed directly by, and very close to, the eastern boundary of this protective zone.

Additional issues and concerns with potential impacts related to traditional and cultural interests were raised by Songhees Nation during the EAs of RBT2 and TMX. These concerns were not raised by Songhees Nation during the TMJ EA but the EAO considers them applicable to the MSA area.

- Concerned about adverse impacts to marine mammals, including SRKWs, and the disruption this would cause to the marine ecosystem. The SRKWs is a culturally important species to Songhees
    - See Section 13.3.3 for a detailed discussion of the analysis and resolution of concerns related to the effects on whales. As discussed in Section 13.3.3, the EAO concluded that TMJ would not result in significant residual effects to Marine Mammals; however, the EAO notes that the current baseline of cumulative effects to SRKWs are already high and that TMJ would contribute additional residual effects from shipping noise and potential avoidance behaviour by SRKWs to ships, such that cumulative effects to SRKWs are considered significant. The EAO is recommending as a KMM a Vessel Traffic Management Plan that would require TJLP to incorporate contractual measures to support participation of TMJ-related vessels in the VFPA-led ECHO Program seasonal

slowdown initiatives (as amended) or a future equivalent, and annual reporting on TJLP's participation in regional environmental management measures and cumulative effects monitoring to protect SRKW, where feasible. The seasonal slowdown initiatives currently request vessels to slow down in key SRKW foraging areas such as Swiftsure Banks, Haro Strait and Boundary Pass.

- Concerned about the pollution due to increased marine traffic and the contamination of food sources.
    - As discussed in the Accidents and Malfunctions and Effects of the Environment section in Part B of this Report, vessels would be required to internationally recognized safety standards that include pollution prevention of ships; and
    - As discussed in the Human Health and Air Quality sections in Part B, changes to air quality were determined to be the only primary pathway of potential effect to human health in the MSA area. The EAO concluded that there would be no predicted residual effects to human health in the MSA area.
- Concerned about adverse impacts to important cultural, spiritual, archaeological, and ecological sites and values at *Tl'ches* and impacts to spiritual and ceremonial connections to lands and waterways.
    - In the Current Use section in Part B of this Report it was determined that with the marine transportation regulatory regime, as well as low frequency and short duration of TMJ-related traffic there would be negligible to low magnitude of effect of Indigenous access to known heritage sites.
- Concerned with erosion of banks due to shipping wake and potential exposure of burial sites and damage to docks and archeological sites. Concerns that heritage resources and archeological sites could be disturbed or eroded by shipping wake, and these effects may combine with climate-related rises in sea level. Concerned that wave disturbances limit access to culturally important areas and the exercise of Treaty rights and other interests.
    - See Section 13.3.3 for a detailed discussion to address this concern. As discussed in Section 13.3.3, the impacts to cultural sites from wakes are not anticipated (see section on Vessel Wake in Part B) and access to tangible to tangible and intangible heritage resources were considered negligible.
    - The EAO's conclusions in the Heritage Resources section in Part B of this Report which found no residual effects on Heritage Resources from erosion due to wake effects along the shorelines of the MSA area.

- The EAO concluded that the TMJ-related vessel wake would be within natural variation of the wave heights in this area, see Vessel Wake section of Part B of this Report.

- Concerned about potential impacts to Treaty rights and other interests including loss of, or impaired access to, preferred harvesting and resource use areas due to increased marine traffic and/or ship size and the effects of any spill on the marine ecosystem.
  - In the Current Use section in Part B of this Report it was determined that with the marine transportation regulatory regime, as well as low frequency and short duration of TMJ-related traffic there would be negligible to low magnitude of effect of Indigenous access to known resource harvesting areas in Songhees Nation's traditional territory.
  - In the Accidents and Malfunctions and Effects of the Environment in Part B of this Report, with consideration of the MSA, that the risk of an LNG or bunker fuel release would have consequence severities ranging from moderate to very high with the very high being on SRKWs and heritage resources and having potentially irreversible effects. However, the likelihood was estimated to be extremely rare as the release need to occur in the vicinity of these susceptible sites.
- Concerned about safety of smaller boats in high traffic areas, the potential for collisions and accidents, and the safety of Songhees members exercising their Treaty rights and other interests.
  - Marine shipping associated with TMJ would be required to meet the international standards and Canadian regulations set out by Canada's compliance-based marine safety and security system, which is designed to protect life, property, and the marine environment.
  - In the Current Use section of this Report, the EAO predicted that regularly occurring and short-duration TMJ-related vessel transits would have negligible to low magnitude effects to access to harvesting sites in the MSA area. The EAO is recommending a KMM under CEAA 2012 for a Marine Communication Plan out to 12 nm that would be developed in consultation with Schedule B and D Indigenous Groups and include procedures to inform Indigenous Groups of traffic schedules, for Indigenous Groups to provide feedback on adverse effects related to navigation as a result of TMJ, and for TJLP to document and respond to feedback in a timely manner.

Conclusion

The EAO predicts the TMJ-related marine shipping effects alone would have **negligible-to-minor** impacts on Songhees Nation's other cultural and traditional interests, although the EAO acknowledges that there is uncertainty in the relationship between incremental increases in shipping and the availability of cultural resources, such as SRKW. However, in consideration of the available information in Section 13.3.3, the EAO's consultation with Songhees Nation, TJLP's commitments and the EAO's proposed EAC conditions if an EAC is issued, and the recommended KMMs under CEAA 2012, the EAO concludes that TMJ-related marine shipping effects combined with cumulative effects in the MSA area is expected to result in moderate-to-serious impact on Songhees Nation's other traditional and cultural interests. The EAO's conclusions of significant cumulative effects to SRKW was a major key factor considered in the EAO's seriousness determination. The EAO notes several regional initiatives and measures have been implemented by the Government of Canada to better understand and manage cumulative effects on the recovery of SRKWs (listed in Section 13.1.1).

The key factors that were considered in support of EAO's conclusion on the impacts to other traditional and cultural interests are summarized as follows:

Cultural and Heritage Resources:

- The EAO's conclusions Part B did not predict residual effects Heritage Resources (Section 7.1) from erosion due to wake effects along the shorelines of the MSA area;
- The EAO's conclusions in the Marine Mammals section in Part B, which found low to moderate magnitude residual effects from TMJ-related vessels on SRKWs and significant cumulative effects to SRKWs; and
- The MSA area is a heavily utilized marine environment.

Geospatial:

- *Tl'ches* has great cultural significance as it was once the site of a Songhees village and contains middens, burial cairns, and other sacred cultural sites. It is in proximity to the shipping lanes; and
- The EAO considers TMJ would result in an incremental increase (i.e., 0.2 – 1.1 % for segments A – D) to vessel traffic when compared to baseline conditions in the Traffic Separation Scheme and would result in negligible to low magnitude effects due to relatively infrequent and short-duration interruptions to access to areas in the Salish Sea.

Social, Cultural, Experiential:

- Potential negligible to low impacts due to incremental increases from TMJ-related vessel traffic during operations affecting visual quality, noise and vessel wake (with an increasing magnitude of effect the closer one is to the vessels);
- Potential concerns regarding safety of small vessels with large vessels and wake effects as assessed in the Accidents and Malfunctions and Effects of the Environment section in Part B; and
- Songhees Nation's cultural and spiritual interest in SRKWs.

Mitigations:

- Proposed mitigations for potential impacts to traditional and cultural interests are the recommended key mitigations under CEAA 2012 for a Marine Communications, and Vessel Traffic Management Plans, and a Marine Shipping Emergency Response Outreach Program; and
- The EAO is recommending as KMMs under CEAA 2012 for a Vessel Traffic Management Plan that would require TJLP to incorporate contractual measures to support participation of TMJ-related vessels in the VFPA-led ECHO Program seasonal slowdown initiatives (as amended) or a future equivalent, and annual reporting on TJLP's participation in regional environmental management measures and cumulative effects monitoring to protect SRKW, where feasible. The seasonal slowdown initiatives currently request vessels to slow down in key SRKW foraging areas such as Swiftsure Banks, Haro Strait and Boundary Pass.

16.12 SCIA'NEW (BEECHER BAY) FIRST NATION

16.12.1 COMMUNITY PROFILE

Scia'new (Beecher Bay) First Nation, meaning "big fish", is part of the larger Coast Salish cultural group of people which has occupied the Strait of Georgia continuously for thousands of years. Scia'new First Nation's traditional territory includes an area west of the Saanich Inlet to the southern tip of Vancouver Island and has eight reserves; Beecher Bay 1 is the main and largest reserve. As of February 2022, Scia'new First Nation has a registered population of 266 people

with 102 living on own reserve, 152 living off-reserve, and 12 living on other reserves[378]. Scia'new First Nation is also part of the Te'mexw Treaty Association, along with Malahat Nation, Snaw-Naw-As (Nanoose First Nation), Songhees Nation, and T'Sou-ke First Nation, which is operating within the final phases of the modern treaty process (Stage 5).

Scia'new First Nation has used and occupied its traditional lands and waters territories since time immemorial for hunting, fishing, transport, trade, ceremonies, and settlement. The people of Scia'new First Nation originate from speakers of Clallam or Klallam (Nəxʷsƛ̓aɣəmúcən), occupying present-day Washington, Halkomelem, and Northern Straits Salish. Motivated by fishing and trading, the Clallam migrated from the Olympic Peninsula to Beecher Bay in the mid-19th century but continued to travel back and forth across the Strait of Juan de Fuca by dugout canoe and had strong extended families and ties in both places. The Treaty of Washington (1846) divided the Clallam Nation and families in two along the Strait of Juan de Fuca and imposed two different administrative systems.

Beecher Bay was a strategic fishing location, and its inhabitants adopted the reef net fishing technology from neighbouring Nations. Beecher Bay is located on the sockeye migration route and had responsibility for spreading the news of the sockeye's arrival. The Coast Salish believed salmon were like people and showed them respect with the first salmon rite.

Scia'new First Nation has Douglas Treaty Rights to hunt over unoccupied lands and carry on their fisheries "as formerly." The subsistence, cultural reproduction, and identity of Beecher Bay depend on their marine environment.

The Strait of Juan de Fuca is an important travel way for Scia'new First Nation; members and relatives still travel between Washington and Beecher Bay to visit families, deliver dried fish, pick berries, and attend winter dances and summer festivals. Maintaining community ties and respecting one's place of origin is a long-standing priority of the Coast Salish. Scia'new First Nation members participate in Tribal Canoe Journeys, annual long-distance canoe trips hosted by Pacific Northwest Nations to maintain and exchange cultures, identities, kinship, and inter-generational teachings. Scia'new First Nation believes these trips are vulnerable to increased shipping traffic.

Seafood is key to the identity of the Scia'new First Nation, which prides their territory as an unpolluted source of seafood. Seafood consists of around 64 percent of members' diets and is both food and medicine.

[378] Indigenous and Northern Affairs Canada. 2022. First Nation Profiles – Beecher Bay. https://fnp-ppn.aadnc-aandc.gc.ca/fnp/Main/Search/FNRegPopulation.aspx?BAND_NUMBER=640&lang=eng, Accessed March 23, 2022.

Vancouver Island Coast Salish communities have a traditional provider role where a "superharvester" harvests seafood with every tide and procures most of the seafood shared in networks and at community events, spiritual gatherings, and funerals. Individuals can also specialize in fishing, bivalve harvesting, or diving for sea cucumber and urchin. Sea urchins are prized and hold ceremonial significance for the Scia'new First Nation. Urchins at Beecher Bay are relatively clean, and other Nations are starting to depend on Beecher Bay for urchins. Bivalves are gathered during low tides. Clams are a longstanding staple in the Beecher Bay diet, gathered up to twice a month from nearby beaches. Chitons, mussels, oysters, and herring roe are a preferred food of Scia'new First Nation but are now hard to find within their traditional territory. Abalone is a delicacy and carefully guarded resource.

Scia'new First Nation asserted that cumulative effects such as declining runs, environmental degradation, fishing regulations, and vessel wakes limit their harvest. Scia'new First Nation noted that, as climate change increases water temperatures, fish are moving into cooler water in the deeper shipping lanes, where Beecher Bay First Nation fishers are forced to follow. Scia'new First Nation fishers practice traditional resource management and conservation techniques to rebuild stocks of traditional foods.

Orcas, sacred to the Scia'new First Nation, used to visit Beecher Bay by the hundreds; however, Scia'new First Nation note that recently they are failing to return.

Scia'new First Nation's economic interests tied to the marine environment include a marina, an aquaculture project, and a real estate development on Becher Bay 1.

The coastal area, islands, and open waters of the Strait of Juan de Fuca from Race Rocks to Port Renfrew are preferred fishing areas for Beecher Bay and the location of registered archaeological, burial, and sacred sites. Race Rocks is a biodiverse traditional hunting and harvesting area with multiple uses, for example, to fish in the summer and hunt duck (especially surf scoter, or "black duck," which are hard to find today but are sacred to the Coast Salish) to prepare for Long House season in the fall.

There were at least four reef net sites near Beecher Bay 1, including one at Race Rocks. Reef netting was critical to the Salish economy, cultural identity, resource management, and governance before it was outlawed by the Canadian government in 1916. Scia'new First Nation is one of the communities working to revive this sacred fishery.

Scia'new First Nation families still troll near the historic Race Rocks reef net site for sockeye, chinook, coho, chum, and halibut which are species critical for Beecher Bay subsistence, economies, trade, and culture. Sea urchins were harvested at Race Rocks in the recent past, but this is now a Marine Protected Area, and such activities are prohibited.

16.12.2 SCIA'NEW FIRST NATION INVOLVEMENT IN THE CONSULTATION PROCESS

Consultation with Indigenous Groups identified in Schedule D began in July of 2019 when EAO sent a letter to these groups inviting comments on the draft Section 13 Order, including consultation processes and opportunities. On August 6, 2019, at the request of Canada, the EAO under the Section 13 Order amended the geographic scope for the assessment of the marine shipping route and added the Indigenous Groups identified in Schedule D which included the Scia'new First Nation. For the review of the MSA, the EAO led consultation activities with the Indigenous Groups identified in Schedule D and, as part of this work, invited Scia'new First Nation to participate in the Marine Shipping Working Group. The EAO is of the view that it has approached consultation with Scia'new First Nation at the deeper end of the spectrum, with the intent to identify potential impacts and consider ways to address potential impacts to Aboriginal Interests that were identified by Scia'new First Nation within the MSA area.

During the MSA review, the EAO invited Scia'new First Nation to review and provide comments on TJLP's MSA Supplemental Analysis, the EAO's draft Assessment Report (including Part C of the Assessment Report), the draft CPD, draft Certificate Conditions and recommended KMMs under CEAA 2012. As part of the Marine Shipping Working Group, Scia'new First Nation was invited to participate in Marine Shipping Working Group meetings and teleconferences during the MSA Supplemental Analysis Review stages.

During the MSA review, Scia'new First Nation submitted feedback on TJLP's MSA analysis, including concerns that the MSA should be scoped to 200 nm, about inappropriate use of information from the RBT2 process, insufficient assessment of impacts due to LNG carrier spill or accident, and that cumulative impacts of development on the health of the ocean ecosystems should be included in the assessment. Scia'new First Nation also requested that the MSA should include new studies to understand impacts to Scia'new First Nation's rights and that TJLP should be required to invest into the long-term health of the ocean. Further information related to concerns raised by Indigenous Group's with respect to scoping of the MSA and reliance on information from RBT2 and TMX processes is provided in Section 13 of this Report. During review of TJLP's BVSA Report, Scia'new First Nation's representative attended three Working Group meetings and raised concerns related to the increased bunker vessel traffic, including potential effects to the distribution of vessels in the MSA Area, and marine species that utilize the Fraser River watershed, which are important to its culture or to which it has harvesting rights, including SRKWs and salmon, respectively.

The EAO offered to meet directly with Scia'new First Nation to discuss TMJ, EA process, and any potential concerns with TMJ. Teleconference meetings with Scia'new First Nation's legal

representative were conducted at their discretion and when requested. Scia'new First Nation met separately with TJLP in relation to TMJ, including more recent discussions regarding the BVSA occurring in April 2022. The EAO considered Scia'new First Nation's feedback provided on the MSA and the EAO endeavoured to reflect Scia'new Nation's concerns and perspectives related to potential impacts to Scia'new First Nation's Aboriginal Interests due to TMJ and the consultation process in Part C of the Assessment Report.

On July 19, 2022, Scia'new First Nation sent a letter advising the EAO that, based on commitments made by TJLP, Scia'new First Nation consents to the granting of any authorizations or permits necessary for TMJ. Based on the letter, the EAO understands that Scia'new First Nation consider consultation for TMJ has been fulfilled, and that Scia'new First Nation will continue to participate in the EA and other regulatory processes in a manner that is consistent with its consent for TMJ and does not take the position that the Crown's duty to consult and accommodate has not been met. The EAO included Scia'new First Nation's letter of consent in the referral package for decision makers at time of referral.

16.12.3 POTENTIAL IMPACTS TO TREATY RIGHTS AND OTHER INTERESTS

The following sections focus on potential impacts of TMJ to Scia'new First Nation's Douglas Treaty rights to hunt and fish and other interests. A discussion of the EAO's assessment approach is provided in in Impact Assessment Methods of Part C (Section 12.2).

The EAO considered information available, including from public sources as well as relevant issues raised by Scia'new First Nation and members during the EA process (in meetings, letters and Working Group comments), in the following assessments of the potential impacts of TMJ on Scia'new First Nation's Douglas Treaty rights and other interests, mitigations, and accommodations to address potential impacts.

A. POTENTIAL IMPACTS ON FISHING

The EAO evaluated the potential effects of TMJ on Aboriginal fishing rights and provided a summary in Section 13.3.1. In addition, the EAO considered relevant information related to potential shipping-related effects based on review of the RBT2 Panel and TMX EA processes. The EAO is satisfied that the key impacts to biophysical components resulting in changes to fish quantity and quality, changes in access to fishing resources, and changes to social, cultural, and spiritual values associated with traditional fishing activities that apply to Scia'new First Nation are summarized in Section 13.3.1.

Scia'new First Nation raised the following concerns regarding potential impacts on the right to fish due to TMJ:

- Concern regarding the potential cumulative impact of TMJ on steelhead, chinook and SRKWs, in relation to land and resources for traditional purposes.
    - As discussed in Section 13.3.1, the EAO is recommending KMMs under CEAA 2012 for the Fish Mitigations to Reduce Harm and Mortality, Fish Habitat Offset Plan, and Vessel Traffic Management Plan to address these concerns. The EAO did not predict any residual effects to fish and fish habitat in the MSA area.

The EAO is aware that the RBT2 panel report (2020) notes that Scia'new First Nation fish at Swiftsure Bank, particularly for halibut. Scia'new First Nation also reported safety concerns when encountering large vessels on the water.

Additional issues and concerns with potential impacts related to fishing were raised by Scia'new First Nation during the EAs of RBT2 and TMX. These concerns were not raised by Scia'new First Nation during the TMJ EA, but the EAO considers them applicable to the MSA area.

- Concern that fishing rights have already been affected by shipping, in part because of the requirement to make way for large ships. And the challenges of fishing for halibut near Race Rocks because of vessel traffic.
    - See Section 13.2.1 for a detailed discussion of the analysis and resolution of concerns related to the effects of TMJ on fish and fishing rights. As discussed in Section 13.2.1, the proposed mitigation measures to addresses concerns around fish and access to fishing are included in the fish and fish habitat monitoring and mitigation plan in addition to the Marine Communications and Vessel Traffic Management Plans.
- Concern about the impact of introduced and invasive species on traditional and harvestable species.
    - In the Fish and Fish Habitat and Water sections of Part B of this Report, the EAO notes that the potential introduction of invasive species from ballast water discharge would be sufficiently managed through adherence to federal regulations (*Canada Shipping Act*, 2001) and international conventions (for example, MARPOL Convention) that prohibit these activities in the Fraser River and MSA area.

Conclusion

In consideration of the available information in Section 13.2.1, which outlines the potential effect to fishing; consultation with Scia'new First Nation; Scia'new First Nation's engagement with TJLP; TJLP's commitments; and the EAO's proposed EAC conditions if an EAC is issued and

the recommended KMMs under CEAA 2012, TMJ is expected to result in **negligible-to-minor** impact on Scia'new First Nation's right to fish.

The key factors that were considered in support of the EAO's conclusion on the impacts to the right to fish are summarized as follows:

Biophysical:

- The EAO's conclusions on adverse residual effects in the Fish and Fish Habitat chapter in Part B which does not predict any residual effects to fish and fish habitat in the MSA area; and
- The MSA area, including Swiftsure bank, is a heavily utilized marine environment with occasionally high levels of marine traffic in the shipping lanes.

Geospatial:

- The coastal area, islands, and open waters of the Strait of Juan de Fuca from Race Rocks to Port Renfrew are preferred fishing areas for Scia'new First Nation;
- RBT2 Panel reports Scia'new First Nation fish at Swiftsure Bank, particularly for halibut; Swiftsure bank is intersected by shipping lanes where cumulative effects from shipping traffic is a constraint; and
- The EAO considers TMJ would result in an incremental increase (i.e., 0.2 – 1.1 % for segments A – D) in vessel traffic when compared to baseline conditions in the Traffic Separation Scheme and that TMJ-related vessel transits during operations (minimum 30 years) would result in negligible to low magnitude effects due to relatively infrequent and short-duration interruptions to access to fishing areas in the Salish Sea.

Social, Cultural and Experiential:

- Potential negligible to low impacts due to incremental increases from TMJ-related vessel traffic during operations affecting visual quality, noise, and vessel wake (with an increasing magnitude of effect the closer one is to the vessels); and
- Safety concerns when encountering large vessels on the water and that fishing rights have already been affected by shipping.

Mitigations:

- Proposed mitigations for impacts to Scia'new First Nation fishing rights include the Marine Communications Plan recommended as KMMs under CEAA 2012; and
- The EAO acknowledges that these mitigation measures would not reduce impacts for baseline conditions and/ or impact of future projects, which are a source of issues for

many Indigenous Groups.

B. POTENTIAL IMPACTS ON HUNTING, TRAPPING AND GATHERING

The EAO evaluated the potential effects on hunting, trapping and gathering activities attributable to TMJ in Section 13.3.2 above that apply broadly to Indigenous Groups. The EAO is satisfied that the key impacts to biophysical components resulting in changes to wildlife and vegetation quantity and quality, changes in access to hunting, trapping and gathering areas, and changes to social, cultural, and spiritual values associated with traditional hunting, trapping and gathering activities that apply to Scia'new First Nation are summarized in Section 13.3.2. Scia'new First Nation did not raise specific issues and concerns with potential TMJ impacts related to hunting, trapping, and gathering.

Conclusion

In consideration of the available information in Section 13.3.2, the EAO's consultation with Scia'new First Nation; Scia'new First Nation's engagement with TJLP, TJLP's commitments, the EAO's proposed EAC conditions if an EAC is issued and the recommended KMMs under CEAA 2012, TMJ is expected to result in **negligible** impact on Scia'new First Nation's hunting, trapping and gathering.

The key factors that were considered in support of the EAO's conclusion on the impacts to hunting, trapping, and gathering included the EAO's conclusions on adverse residual effects to wildlife in the MSA area predict negligible to low magnitude mortality of select marine bird species. The EAO also considered that in the MSA area, operations (30 years in duration) may cause infrequent, short-term, temporary disruptions to marine-based hunting along the proposed LNG vessel route and negligible effects on Indigenous access to terrestrially based hunting, trapping, and gathering sites that are accessed by boat from the pilot station at Sand Heads to the 12 nm territorial limit. To mitigate potential impacts to Scia'new First Nation's right to hunt, trap and gather, the EAO is recommending a KMM under CEAA 2012 for a Marine Communication Plan, including procedures to inform Indigenous Groups of traffic schedules and for Indigenous Groups to submit any feedback on potential adverse effects on navigation as a result of TMJ. The EAO also considered that the small relative increase due to TMJ-related vessel traffic would have a negligible effect to experiential aspects of hunting, trapping, and gathering from changes to visual quality and noise in the MSA and that all TMJ related vessels would adhere to the Marine Regulations and Legislation regulating vessel noise and lighting.

C. POTENTIAL IMPACTS ON OTHER TRADITIONAL AND CULTURAL INTERESTS

The EAO evaluated the potential for TMJ-related residual and cumulative effects to impact other traditional and cultural interests of Indigenous Groups in the MSA, as summarized in Section 13.3.3. In its evaluation, the EAO considered potential marine-shipping related effects

pathways to impacts based on review of publicly available information from RBT2 and TMX processes, and any information provided by Indigenous Groups during the MSA review. The EAO is satisfied that TMJ's marine shipping-related effects in the MSA area to access, quality of experience and SRKWs would be the pathways to impacts to Scia'new First Nation's other cultural and traditional interests.

During the MSA review, Scia'new First Nation raised concerns about potential environmental effects from an accident or malfunction, resulting in a spill in the waterways of Scia'new First Nation's traditional territory and that the Accidents and Malfunctions risk assessment in the MSA failed to provide rationale for the bunker fuel estimate and was limited by assessing a spill at only one location and at one time of year.

- In the Accidents and Malfunctions and Effects of the Environment section in Part B, with consideration of the MSA, it was determined that the risk of an LNG or bunker fuel release would have consequence severities ranging from moderate to very high with the very high being on SRKWs and heritage resources and having potentially irreversible effects. However, the likelihood was estimated to be extremely rare as the release would need to occur in the vicinity of these susceptible sites or SRKWs;
- TJLP clarified that the lower volume estimate for bunker fuel spill assessment did not affect the MSA, which was conservatively based on the oil spill modelling results performed for TMX, and the modelling results from RBT2 and TMX were qualitatively expanded for the MSA area, which included seasonal variation; and
- Marine shipping associated with TMJ would be required to meet the international standards and Canadian regulations set out by Canada's compliance-based marine safety and security system, which is designed to protect life, property, and the marine environment. The EAO is recommending a KMM under CEAA 2012 for a Marine Shipping Emergency Response Outreach Program to facilitate the integration of plans for responding to incidents in transit into existing emergency response systems, primarily the CCG's Incident Integrated Response Plans.

Scia'new First Nation also identified that cumulative impacts of development on the health of the ocean is a major concern, including the collapsing steelhead, chinook and SRKW populations, which Scia'new First Nation considers are signs of an imbalance in the marine environment. Scia'new First Nation requested that TJLP contribute to supporting the long-term recovery and health of the ocean such as enhanced tug escorts for LNG carriers or additional investments in government spill response capacity.

- The EAO acknowledges Scia'new First Nation's concerns regarding cumulative impacts to the health of the ocean, including potential effects to fish and SRKWs and the entire

ecosystem;

- See Section 13.2.3 for a detailed discussion of the analysis and resolution of concerns related to the effects on whales. As discussed in Section 13.2.3, the EAO concluded that TMJ would not result in significant residual effects to Marine Mammals; however, the EAO notes that the current baseline of cumulative effects to SRKWs are already high and that TMJ would contribute additional residual effects from shipping noise and potential avoidance behaviour by SRKWs to ships, such that cumulative effects to SRKWs are considered significant;
- TJLP stated that they are commitment to adhering to the mitigation measures outlined in the MSA and that TJLP adaptive management of mitigation measures would be an essential part of the overall management strategy to promote ocean health. TJLP also stated they have included a requirement that management measures related to SRKWs would be reviewed on an annual basis to determine if changes need to be incorporated into TMJ shipping practices. TJLP also anticipates that tug escorts would be required for LNG vessels in Boundary Pass and Haro Strait; and
- The EAO is recommending as a KMM under CEAA 2012 a Vessel Traffic Management Plan that would require TJLP to incorporate contractual measures to support participation of TMJ-related vessels in the VFPA-led ECHO Program seasonal slowdown initiatives (as amended) or a future equivalent, and annual reporting on TJLP's participation in regional environmental management measures and cumulative effects monitoring to protect SRKW, where feasible. The seasonal slowdown initiatives currently request vessels to slow down in key SRKW foraging areas such as Swiftsure Banks, Haro Strait and Boundary Pass. The EAO notes several regional initiatives and measures have been implemented by the Government of Canada to better understand and manage cumulative effects on the recovery of SRKWs (listed in Section 13.1.1).

Additional issues and concerns with potential impacts related to traditional and cultural interests were raised by Scia'new First Nation during the EAs of RBT2 and TMX. These concerns were not raised by Scia'new First Nation during the TMJ EA but the EAO considers them applicable to the MSA area.

- Concerns about the effect of large-vessel wakes on marine uses and concerns about safety.
    - The EAO concluded that the TMJ-related vessel wake would be within natural variation of the wave heights in this area (see Vessel Wake section in Part B of this Report.
    - In the Current Use section in Part B, it was determined that with the marine

transportation regulatory regime, as well as low frequency and short duration of TMJ-related traffic there would be negligible to low magnitude of effect of Indigenous access to fishing areas.

- Concern that the routine operation of ships impacting the exercise of Treaty rights and other interests, including restricting the times and locations in which those rights can be exercised; disrupting travel ways utilized by Scia'new First Nation members to exercise those activities; and increasing the likelihood of a collision between a large ship and a vessel owned or operated by Scia'new First Nation or a Scia'new First Nation member
    - In the Current Use section of this Report, the EAO predicted that regularly occurring and short-duration TMJ-related vessel transits would have negligible to low magnitude effects to access to harvesting sites in the MSA area. The EAO is recommending a KMM under CEAA 2012 for a Marine Communication Plan out to 12 nm that would be developed in consultation with Schedule B and D Indigenous Groups and include procedures to inform Indigenous Groups of traffic schedules, for Indigenous Groups to provide feedback on adverse effects related to navigation as a result of TMJ, and for TJLP to document and respond to feedback in a timely manner.
- Concern about the difficulty securing compensation for damages to culture and Treaty rights in the event of an accident or spill involving a vessel.
    - As described in the Accidents and Malfunctions and Effects of the Environment section in Part B of this Report, Canada has a comprehensive liability and compensation regime covering different types of marine risks involving ships, including oil pollution, the release of HNS, collisions, and wreck removal. Refer to the Accidents and Malfunctions chapter (Section 9.3) for more details.

Conclusion

The EAO predicts the TMJ-related marine shipping effects alone would have **negligible-to-minor** impacts on Scia'new First Nation's other cultural and traditional interests, although the EAO acknowledges that there is uncertainty in the relationship between incremental increases in shipping and the availability of cultural resources, such as SRKW. However, in consideration of the available information, the EAO's consultation with Scia'new First Nation, TJLP's commitments, the EAO's proposed EAC conditions if an EAC is issued and the recommended KMMs under CEAA 2012, the EAO concludes that TMJ-related marine shipping effects combined with cumulative effects in the MSA area is expected to result in **moderate-to-serious** impact on Scia'new First Nation's other traditional and cultural interests. The EAO's conclusions of significant cumulative effects to SRKW was a major key factor considered in the EAO's seriousness determination. The EAO notes several regional initiatives and measures have been

implemented by the Government of Canada to better understand and manage cumulative effects on the recovery of SRKWs (listed in Section 13.1.1).

The key factors that were considered in support of EAO's conclusion on the impacts to other traditional and cultural interests are summarized as follows:

Cultural and Heritage Resources:

- The EAO's conclusions Part B did not predict residual effects to Heritage Resources (Section 7.1) from erosion due to wake effects along the shorelines of the MSA area;
- The EAO's conclusions in the Marine Mammals section in Part B, which found low to moderate magnitude residual effects from TMJ-related vessels on SRKWs and significant cumulative effects to SRKWs; and
- The MSA area is a heavily utilized marine environment.

Geospatial:

- The Strait of Juan de Fuca is an important travel way for Scia'new First Nation. Scia'new First Nation members participate in Tribal Canoe Journeys, annual long-distance canoe trips in the MSA area, including crossing shipping lanes, to maintain and exchange cultures, identities, kinship, and inter-generational teachings; and
- The EAO considers TMJ would result in an incremental increase (i.e., 0.2 – 1.1 % for segments A – D) to vessel traffic when compared to baseline conditions in the Traffic Separation Scheme and would result in negligible to low magnitude effects due to relatively infrequent and short-duration interruptions to access to areas in the Salish Sea.

Social, Cultural, Experiential:

- Potential negligible to low impacts due to incremental increases from TMJ-related vessel traffic during operations affecting visual quality, noise, and vessel wake (with an increasing magnitude of effect the closer one is to the vessels);
- Potential concerns regarding safety of small vessels with large vessels and wake effects, as assessed in the Accidents and Malfunctions and Effects of the Environment section in Part B; and
- Scia'new First Nation's cultural and spiritual interest in SRKWs.

Mitigations:

- Proposed mitigations for potential impacts to traditional and cultural interests are the recommended key mitigations under CEAA 2012 for a Marine Communications, and

Vessel Traffic Management Plans, and a Marine Shipping Emergency Response Outreach Program; and

- The EAO is recommending as KMMs under CEAA 2012 for a Vessel Traffic Management Plan that would require TJLP to incorporate contractual measures to support participation of TMJ-related vessels in the VFPA-led ECHO Program seasonal slowdown initiatives (as amended) or a future equivalent, and annual reporting on TJLP's participation in regional environmental management measures and cumulative effects monitoring to protect SRKW, where feasible. The seasonal slowdown initiatives currently request vessels to slow down in key SRKW foraging areas such as Swiftsure Banks, Haro Strait and Boundary Pass.

17.0 WEIGHT OF IMPACTS TO ABORIGINAL INTERESTS WITH PROVINCIAL INTERESTS

The Crown has a responsibility to weigh the potential impacts and accommodations on Aboriginal Interests with other societal interests, including the social, environmental and economic benefits of TMJ. This evaluation is an important component informing the Ministers' decision on whether or not to approve TMJ. In weighing the benefits of TMJ with the impacts on Aboriginal Interests, the EAO holds the view that the following factors are relevant to consider:

- Importance of TMJ to the local, regional, and provincial economy;
- The nature of TMJ;
- Resources or values available for future generations; and
- Benefits of TMJ to affected Indigenous Groups.

The EAO has summarized the estimated TMJ benefits during construction and operations in section 2.3 (Project Benefits and Purpose) of Part A of the EAO's Assessment Report. The nature of TMJ including TMJ components and activities are described in section 2.2 (Project Description and Scope) of Part A the EAO's Assessment Report.

17.1 IMPORTANCE OF THE PROPOSED PROJECT

Canada is seen as a desirable source of natural gas supply because of its political and regulatory stability. Exporting LNG offers the opportunity for Canadian producers to access international markets. TMJ would provide a key link between natural gas produced in Canada and growing

global LNG markets. Regarding ship-to-ship LNG marine refuelling (i.e., bunkering) service, the use of LNG to power the world's ocean-going vessels is forecast to expand and BC is well positioned to benefit from this growth. TJLP has noted that the BVS would support the Port of Vancouver in its goal to shift from marine oil fuel to cleaner LNG fuel, and open up BC's natural resources to markets that need low-carbon energy to displace coal. The increased activity of LNG-powered ships would reduce the GHG emissions produced by the international marine shipping industry, in line with efforts to lower other transportation emissions under CleanBC. According to industry standards, replacing diesel fuel with LNG has the potential to reduce GHG emissions by approximately 20 percent. It also offers an opportunity for provincial economic growth and job creation. Over the construction phase, TJLP proposes to spend up to $200 million dollars in BC.

TJLP estimates that in BC, construction would create approximately 276 FTEs of direct employment and anticipates contributing approximately $1.7 million annually during construction to provincial government revenue. During operations, direct annual operational expenditures, employment and labour income would result in very small annual changes provincial government revenue relative to that of the provincial and local (Metro Vancouver) economy.

RESOURCES OR VALUES AVAILABLE FOR FUTURE GENERATIONS

The scope of TMJ relates to the transport of liquid natural gas, rather than involving primary resource extraction. As described above and in the Report, traditional subsistence activities, such as hunting, trapping, gathering, and in particular, fishing, and access to areas where these activities are conducted may be altered as a result of TMJ, which could manifest itself through changes to local harvesting locations, behavioural alteration or sensory disturbance of environmental resources.

The EAO believes there could be potential impacts to resources or values of importance to Indigenous groups. The EAO is of the view that TJLP has made efforts to demonstrably understand and avoid high value areas for Indigenous groups, by building on or adjacent to existing disturbed and industrial lands, minimizing clearing wherever possible, designing and constructing the jetty to minimize impacts to fish and fish habitat, offsetting impacts to fish habitat where long-term effects are unavoidable, committing to avoid, where possible, impacts to archaeological sites and committing to reduce impacts to access to Indigenous or commercial fisheries openings in the Fraser River, and providing appropriate mitigation measures to reduce the potential effects of TMJ-related shipping. Further consultation and analysis to support the development of management and monitoring plans prior to

construction and operation would require that any additional KMMs are implemented to ensure potential impacts are minimized, as required by the EAO's proposed EAC conditions and recommended KMMs under CEAA 2012.

17.2 BENEFITS TO AFFECTED INDIGENOUS GROUPS

The EAO is aware that TJLP has indicated that they would support employment, contracting and business development for Indigenous groups including as follows:

- Identifying training and capacity building partnerships or other arrangements to increase opportunities for Indigenous participation;
- Encouraging and supporting the use of Indigenous and local businesses by encouraging suppliers and subcontractors to adopt local procurement; and
- Ongoing active engagement with Indigenous groups to ensure that local Indigenous communities benefit directly from TMJ, including opportunities related to employment, training and contracting.

The EAO proposes a condition requiring the development of an Indigenous Training, Employment and Procurement Plan which would outline the means by which local and Aboriginal hiring and procurement policies would be implemented and methods for communicating training, employment and procurement opportunities to Indigenous Groups and their members. The Plan would also describe measures to provide opportunities and training for Indigenous monitors and enhance the hiring and retention of Indigenous Groups and their members, support Indigenous Groups in accessing employment and procurement benefits from TMJ, and procurement of goods and services from businesses owned by Indigenous Groups.

The EAO also proposes an Indigenous Cultural Awareness and Recognition condition which states that TJLP must offer opportunities to Indigenous Groups on Schedule B in the lower Fraser River to lead or support activities such as ceremonies, installation of signage, executing cultural protocols, transmission of knowledge or language, recognizing cultural heritage and providing cultural awareness training to TMJ employees.

The EAO also understands that TJLP is currently negotiating some benefits agreements for TMJ, and the EAO has received letters of consent for TMJ to proceed from 11 Indigenous Groups: Musqueam Indian Band, Maa-nulth First Nations [Huu-ay-aht First Nations, Ka:'yu:'k't'h'/Che:k'tles7et'h' First Nations, Toquaht Nation, Uchucklesaht Tribe, Ucluelet First Nation (Yuułuʔiłʔatḥ First Nation)], Esquimalt Nation, Scia'new (Beecher Bay) First Nation, Pacheedaht First Nation, Pauquachin First Nation, and T'Sou-ke Nation. These agreements would provide benefits that include opportunities in the areas of construction contracts,

monitoring, cultural heritage protection, Indigenous awareness and cultural recognition, training, and other potential benefits of interest. The EAO is aware that TJLP has committed to contribute up to $2 million to the FNFLF[75], which is a program led by several Indigenous groups that supports recovery programs for chinook salmon, eulachon and sturgeon in the Fraser River and Salish Sea. The EAO has heard from FNFLF that the investment is viewed as a meaningful contribution to Indigenous led stewardship, transmission of knowledge, and access/experience of fishing for future generations. For more information about the EAO's consideration of TJLP's contribution proposal, refer to Section 13.1 on Current Context and Cumulative Effects in Part C.

PART D - CONCLUSIONS

Based on:

- Information contained in the original Application and MSA, and supplemental information provided by TJLP, Indigenous Groups and Working Group members during the Application review;
- TJLP and the EAO's efforts at consultation with Indigenous Groups, federal, provincial, and local government agencies and the public, and TJLP's commitment to ongoing consultation;
- Comments on TMJ made by Indigenous Groups, federal, provincial and local government agencies as members of the EAO's Working Group, and TJLP's and the EAO's responses to those comments;
- Comments on TMJ received during the public comment periods, and TJLP's responses to those issues;
- Issues raised by Indigenous Groups regarding the potential effects of TMJ to their Aboriginal Interests and Treaty rights, and TJLP's response and best effort to address those issues;
- Issues raised by Indigenous Groups that were outside of the scope of the TMJ EA, and the federal and provincial agencies' and TJLP's approaches to address those issues;
- The design of TMJ as specified in the EAO's proposed Schedule A (Certified Project Description) of the EAC to be implemented by TJLP during all phases of TMJ, should an EAC be issued;
- Mitigation measures identified as proposed conditions in the EAO's proposed Schedule B (Table of Conditions) of the EAC to be undertaken by TJLP during all phases of TMJ, should an EAC be issued;

- The EAO's recommended KMMs under CEAA 2012, to be undertaken by TJLP during all phases of TMJ, intended to inform federal conditions;
- The EAO's understanding that existing constraints and cumulative effects in the lower Fraser River and in the shipping lanes in the Salish Sea may increase the overall seriousness of effect of TMJ on Aboriginal Interests and Treaty rights;
- The initiatives being led by the Government of Canada to collect habitat and monitoring information, implement management measures to address cumulative effects, and support capacity building by Indigenous groups to undertake studies and stewardship activities in the Salish Sea (see Section 13.1.1). The EAO views this as relevant context for understanding regional cumulative effects (see Section 13.1.2); and
- TJLP's commitment to contribute up to $2 million to the First Nations Fisheries Legacy Fund, which is a program led by a several Indigenous groups that supports recovery programs for chinook salmon, eulachon and sturgeon in the Fraser River and Salish Sea. The EAO has identified that the proposed contribution is relevant for decision makers to consider as part of the context when making their decision on TMJ (see Section 13.1).

The EAO is satisfied that:

- Potential accidents and malfunctions associated with TMJ have been adequately identified and assessed for this EA;
- The EA process has adequately identified and assessed potential adverse environmental, economic, social, heritage and health effects of TMJ, having regard to the proposed conditions set out in Schedule B (Table of Conditions) to the EAC, if issued, and the recommended KMMs under CEAA 2012;
- Consultation with agencies and the public has been adequately carried out;
- Issues identified by government agencies, and members of the public, which were within the scope of the EA, were adequately and reasonably addressed during Application Review;
- Although the EAO did not conduct a comprehensive regional cumulative effects assessment on all the various existing constraints and pathways of effect for Current Use of Lands and Resources for Traditional Purposes for fishing or Cultural Heritage for the TMJ EA, the EAO considered where TMJ effects intersect with known constraints and cumulative effects and information provided by Indigenous Groups to better inform decision makers on how cumulative effects may be experienced by Indigenous Groups;
- There are existing significant cumulative effects to SRKW, current use of lands and resources for traditional purposes for fishing in the lower Fraser River and at Swiftsure Bank, and to cultural heritage for some Indigenous Groups. Although the EAO concludes

that the residual effects from TMJ alone would not be significant, TMJ would interact with these baseline effects and those from reasonably foreseeable projects in a cumulative manner, and the EAO is concluding significant cumulative effects for these VCs; and

- TMJ would result in adverse residual or cumulative effects to other environmental, social, heritage and health VCs, but with the application of mitigation measures and legally-binding conditions, these effects would not be significant.

The EAO is of the view that the potential adverse effects on the Aboriginal Interests and Treaty Rights of Indigenous Groups have been avoided, minimized and accommodated to the extent possible through TJLP's commitments, the EAO's proposed EAC conditions if an EAC is issued, and the recommended KMMs under CEAA 2012. The EAO is also of the view that the EAO has fulfilled its obligations for consultation and accommodation to Indigenous Groups relating to the issuance of an EA Certification for TMJ. The EAO recognizes that there are outstanding impacts, in particular regarding cumulative effects, and these outstanding impacts are reflected in the EAO's conclusions in Part B and Part C.

APPENDIX 1 – THE EAO'S RECOMMENDED KEY MITIGATION MEASURES UNDER THE CANADIAN ENVIRONMENTAL ASSESSMENT ACT, 2012 (CEAA 2012)

Please note that the recommended Key Mitigation Measures (KMMs) under the *Canadian Environmental Assessment Act,* 2012 (CEAA 2012) inform the draft federal conditions. If Tilbury Marine Jetty Project (TMJ) is approved, the federal conditions would be legally binding on the Tilbury Jetty Limited Partnership (TJLP), whereas the KMMs are not. Please see LINK for the Draft Federal Potential Conditions.

The draft KMMs apply to the Marine Terminal Area, as specified in Figure 1 of the provincial draft Certified Project Description (CPD), unless otherwise noted. Consultation on all plans is required with Indigenous Groups identified in Schedule B in the provincial Section 11 and 13 Orders. Consultation is required with Indigenous Groups identified in Schedule D of the Section 13 Order dated August 6, 2019 where noted.

Table 33: The EAO's Recommended Key Mitigations Measures Under the *Canadian Environmental Assessment Act, 2012*, for the Tilbury Marine Jetty Project

Federal Conditions Section	CEAA 2012 linkage	BC EAO Valued Component	Key Mitigation Measures
Fish and Fish Habitat	5(1)(a)(i)	Water Quality	Water Quality Mitigations: *In-water works Mitigations*: a) Reduce sediment disturbance and prevent discharge containing total suspended solids, concrete wash water and fuel from entering the aquatic environment; b) Conduct real-time on-site monitoring and compare to BC Ambient Water Quality Guidelines (Criteria) for Turbidity, Suspended and Benthic Sediments (2001), or as replaced or updated from time to time by a qualified Environmental Monitor during high risk activities (i.e., in water works with the potential to increase suspended sediments such as dredging and pile driving); c) Implement real-time turbidity monitoring of both background and project-related releases during in-water works, including pile driving and removal of temporary piles, and compare against B.C. Water Quality Guidelines. If turbidity levels exceed these guidelines, pre-determined decision criteria with specific management actions will be followed; d) Define triggers for mitigation (e.g., concentrations, differences in turbidity, etc.); e) Develop and implement a response plan that includes specific management actions when pre-determined decision criteria are exceeded; f) Implement best practices for in-water works that minimize contamination, sediment disturbance and TSS generation (including the use of bottom feed when completing vibro-replacement stone columns for ground stabilization); g) Implement best practices for removal of temporary piles (Hutton & Samis, 2000[379]; and MOTI, 2013[380]); h) Maintain onshore refueling activities to areas more than 50 m from watercourses. Maintain onshore stockpiling activities to areas south of the dyke; and i) When operating hydraulic machinery in and over the water use either biodegradable hydraulic fluids or ensure that additional measures are in place to prevent non-biodegradable fluids from entering the water. *Dredging Mitigations:* a) Implement dredging mitigations outlined below during construction and maintenance dredging;

[379] Hutton, K.E and S.C. Samis. 2000. Guidelines to Protect Fish and Fish Habitat from Treated Wood used in Aquatic Environments in the Pacific Region. Habitat and Enhancement Branch, DFO. Available at CREOSOTE (arlis.org)
[380] MOTI. 2013. Guidelines for Use of Treated wood In and around Aquatic Environments and Disposal of Treated wood. Available at Guidelines for Use of Treated Wood In and Around Aquatic Environments and Disposal of Treated Wood (gov.bc.ca)

Federal Conditions Section	CEAA 2012 linkage	BC EAO Valued Component	Key Mitigation Measures
			b) Implement real-time turbidity monitoring of both background and project-related releases during dredging and compare against B.C. Water Quality Guidelines (or as replaced or updated from time to time). If turbidity levels exceed these guidelines, pre-determined decision criteria with specific management actions will be followed; c) Define triggers for mitigation (including concentrations and differences in TSS); d) Develop the decision framework and management actions in accordance with established guidance for dredging in the Fraser River, such as the Fraser River Estuary Management Program (FREMP) Dredging Guidelines and CEMP guidance from the Port of Vancouver; e) Employ dredging practices that minimize the release of sediments to the water column; f) Employ a soft start procedure for dredging, beginning with lower levels of noise and movement before proceeding; g) If suction dredging is used, section-head must be operated within 1.5 metres (m) of the river bottom; and h) Measures to manage return water from dredge material placed upland, such as treatment through sedimentation basins to remove suspended sediment prior to discharge and returning water to the Fraser River via a pipe that extends far enough offshore that water is discharged beneath the water surface. If sediment basins are employed, they would be located on previously disturbed asphalt areas. *Stormwater Management Mitigations*: a) Surface drains and ditches graded according to best management practices and vegetated / lined to reduce runoff; b) Collection of water in temporary sediment control structures and discharge to ground (assumed option) or offsite to municipal storm water system; and c) If discharge off site is needed, then water quality will be analyzed and treated if needed. *Creosote Pile Removal Mitigations (for removal of potential subsurface remnants)*: a. Implement mitigation measures consistent with Fisheries and Oceans Canada's (DFO) *Guidelines to Protect Fish and Fish Habitat from Treated Wood Used in Aquatic Environments in the Pacific Region*; b. Review and consider Washington Department of Natural Resources Derelict Creosote Piling Removal Best Management Practices for Pile Removal & Disposal in development of mitigations[381]; c. Attempt to remove entire creosote-treated pile; d. Pile removed by slow and steady pull to reduce disturbance of riverbed habitats – if pile breaks below biologically active zone it may not be advisable to dredge the remainder out. *Erosion and Sediment Control Mitigations*: a) Minimize activities within 30 m wide riparian management area along the Fraser River. In doing so the proponent will avoid vegetation clearing within this area (except for what is required to construct project components) and will not stockpile erodible material in this area; b) Follow existing provincial and federal guidelines; and c) Implement Erosion and sediment control measures as required.

[381] Washington Department of Natural Resources. 2017. Derelict Creosote Pile Removal Best Management Practices for Pile Removal and Disposal. Available at Best Management Practices (BMPs) For Pile Removal & Disposal (wa.gov)

Federal Conditions Section	CEAA 2012 linkage	BC EAO Valued Component	Key Mitigation Measures
			Scour Protection Mitigations: a) Position vessels and barges in a manner to minimize re-suspension of riverbed sediments based on results of annual review of effectiveness of scour protection and results of annual soundings; and b) Identify shallow areas and avoid these areas when maneuvering of work vessels to avoid propeller scour and re-suspension of sediments. *Concrete Works Mitigations*: a) Use of pre-cast, rather than cast-in-place, structures where possible; b) Use of concrete-tight forms to isolate concrete from receiving environment (when cast-in-place methods are necessary); c) Conduct work on structures below high-water mark during low tide in dry conditions; and d) When undertaking in-water work activities that use concrete, do so in a manner consistent with the *Fisheries Act*.
		Fish and Fish Habitat	Fish Mitigations to Reduce Harm and Mortality: a. Identification of reduced-risk work windows identified by Fisheries and Oceans Canada (DFO) and Ministry of Land, Water and Resource Stewardship (LWRS), including those windows for eulachon, sturgeon, salmon species and species at risk; and identification of reduced-risk work windows communicated by Indigenous Groups to the Holder, for In Water works, and the work that will occur within any of these reduced-risk work windows; b. Conduct in-water work activities during reduced risk work windows identified by DFO (June 16 to February 28) unless otherwise authorized by DFO. c. Identification of, and justification for, any work that will occur outside of the reduced-risk work windows identified by DFO and LWRS and Indigenous groups, as determined by a qualified professional (QP); d. Identification of frequency and method of monitoring immediately prior to the start or restart of pile driving and dredging for fish presence. Side-scan sonar surveys shall be used to detect sturgeon within the area of potential harm; e. A description of criteria and triggers to modify or stop in water works in response to fish presence within the area of potential harm of pile driving and dredging or fish kill during pile driving and dredging as determined by the QP listed above. If dredging and pile driving activities are stopped due to fish kill, the steps that will be taken to determine if dredging can resume will be determined by a QP. Fish kills will be reported to LWRS, DFO and Indigenous groups without delay; f. Notification of Indigenous Groups as soon as possible if work is authorized outside the DFO reduced risk window; g. Details on the means and timing of side-scan sonar surveys for sturgeon once the dredge pocket has been established to inform sturgeon occupancy mitigation: 1. Identification of additional mitigations or other actions and the thresholds or triggers to implement these actions resulting from the above monitoring information, in consultation with LWRS, DFO and Indigenous groups; h. Details on the acoustic and vibratory fish deterrent measures to reduce risk of entrainment and harm in response to sturgeon presence, namely, implementation of ramp-up procedures (e.g., Waving/tapping the cutter head through the midpoint of the water column and waiting 30 seconds or soft starts and stops, to give fish time to swim away), each time the dredge is reactivated (e.g., beginning of the day, following breaks, etc.) to avoid entrainment; i. A description of the means by which: 1. Monitoring results will be shared, and timing of sharing, with LWRS, DFO and Indigenous Groups; and 2. Data would be stored and available for future monitoring during the life of the project; j. Seasonal (DFO least risk windows) restrictions on hydraulic suction and clamshell dredging to avoid entrainment of juvenile salmonids and eulachon following established Fraser River dredging management guidelines;

Federal Conditions Section	CEAA 2012 linkage	BC EAO Valued Component	Key Mitigation Measures
			k. Recording and reporting of any observations of sturgeon mortality or injury at the Marine Terminal Area to Indigenous groups. In the event of an observed sturgeon strike at TMJ, TJLP will report the strike to DFO and Indigenous Groups, determine whether the operation of the TMJ played any role and if so, report to DFO and Indigenous Groups on whether further mitigation is appropriate; l. Underwater noise management mitigations: i. Monitor underwater noise – if monitoring demonstrates that sound levels may exceed injury thresholds, the Proponent will provide alternative mitigations in consultation with Indigenous Groups and DFO, to ensure that these thresholds are not exceeded; ii. Minimize multiple underwater noise generating activities at the same time (sequence activities); iii. Conduct works in least risk work window identified by DFO for the region; iv. Use vibratory pile driving as the primary driving method; v. Use of impact pile driving when vibratory pile driving is not technically feasible; vi. Ramp up technique used where pile driving allows to build noise up slowly to allow time for aquatic wildlife to leave; vii. Use of sound attenuation devices or techniques during impact pile driving; viii. Identification of the geographic areas where, the means by which, and the frequency of underwater noise monitoring must occur; and ix. Identification of applicable injury noise threshold for fish and identification of mitigation measures to be implemented in the event that noise levels are approaching thresholds, for example through the use of bubble curtains. Fish habitat offset plan: a) Description of measures that will be implemented to offset habitat loss; b) A timeline for the implementation of the offsetting plan; c) Means to ensure offsetting habitat will provide a higher value than the fish habitat it is replacing, as determined by a qualified professional; d) A description of the measures and standards that will be put in place to avoid or mitigate adverse effects on fish and fish habitat that could result from the implementation of the offsetting measures; e) Monitoring measures to assess effectiveness of the offsetting measures, until offset habitat meets performance standards, to the satisfaction of DFO; f) Description of the contingency measures and associated monitoring measures that will be put into place if the offsetting measures are not successful in offsetting the residual loss or effects on fish habitat resulting from TMJ. The Holder will consult with Indigenous Groups during development and implementation of contingency measure, including roles for Indigenous participation in monitoring; g) The offset plan must include a performance review of previous offsetting plans in the region, where they are publicly available; and h) Identification of opportunities to include wildlife and migratory bird habitat enhancement measures into habitat offsetting plan.
		Marine Mammals	Marine Mammal Management Plan: a) Identification of the activities that could cause injury to marine mammals or behavioural change disturbance to marine mammals; b) Identification of geographic areas where, and periods of time when, underwater noise monitoring will be conducted; c) Description of the goals and objectives of the plan, in addition to any thresholds required for management action; d) Specification of the role of a Qualified Professional in overseeing implementation of the Plan, including implementation of visual monitoring program by a marine mammal observer during pile driving and dredging and reporting marine mammal presence in areas of potential injury to marine mammals;

Federal Conditions Section	CEAA 2012 linkage	BC EAO Valued Component	Key Mitigation Measures
			e) Conduct activities that could cause noise above the marine mammal injury threshold in the areas above only during daylight hours, when visibility is such that marine mammal observers are able to observe marine mammals; f) Identification of the activities which must stop or not start if a marine mammal is sighted in areas where marine mammals may be exposed to underwater noise at levels that can result in physical injury, and which activities must not re-start until the marine mammal has moved out of the relevant area, as determined by a Qualified Professional; g) Mitigation measures to reduce underwater noise**:** 1. Identification of the mitigation measures that will be implemented to reduce behavioural disturbance and prevent injury to marine mammals from underwater noise; 2. Prioritization of vibratory pile driving methods; 3. Sound attenuation devices: use of sound attenuation devices during impact pile driving and vibratory pile driving if noise levels exceed injury thresholds; 4. Use of acoustic monitoring to validate effectiveness of sound attenuation devices to reduce noise in the aquatic environment and to determine when approaching or exceeding injury thresholds; 5. Employ a ramp-up/soft-start procedure to activate equipment (e.g., for the louder construction activities including dredging and pile driving) at the quietest level possible and then gradually increasing the sound; and 6. Sequencing of in-water works to reduce the extent to which underwater noise levels are compounded by multiple sources. Vessel Traffic Management Plan (Figure 3 of CPD; Schedule D): To the extent that it is technically and economically feasible through agreements with customers, the proponent must require that the vessels calling at TMJ follow the below mitigations: a) As per guidance provided through the Port of Vancouver TCZ-4, LNG carriers and bunkers will move at a safe speed which will allow them to properly respond to the prevailing circumstances and conditions and will otherwise maintain speeds no greater than 10 knots within the Fraser River when safe to do so; b) Vessels will follow established routes, where they exist; c) Regular propeller cleaning (minimum once every five years) and repair as needed; d) Participation in Vancouver Fraser Port Authorities-led ECHO Program seasonal slowdown initiatives (as amended from time to time), or a future equivalent program if ECHO ceases to exist; e) Report to the Agency annually on compliance of vessels berthing at the Jetty with the ECHO Program speed limits and explanations for any instances of non-compliance; f) Operators of LNG carriers and bunkers calling on TMJ to use WhaleReport Alert System or equivalent app to aid in the detection of whales; g) Operators of LNG carriers to report any sightings of cetaceans within the marine shipping assessment area as soon it is safe to do so using the B.C. Cetacean Sightings Network's WhaleReport system or other equivalent system for reporting observations of cetaceans in the Salish Sea; h) LNG carrier masters to undergo training on how to visually detect and navigate vessels safely in the presence of cetaceans in the Salish Sea using the Whales in Our Waters tutorial provided by the Vancouver Fraser Port Authority's Enhancing Cetacean Habitat and Observation (ECHO) Program or other equivalent training, and take into account these navigation strategies when navigating vessels in the presences of cetaceans; i) Report vessel marine mammal collisions to DFO and Indigenous Groups; j) Identify how the Proponent is participating (where possible and operationally / economically feasible) in the identification and implementation of regional environmental management measures and cumulative effects monitoring to protect SRKW such as the federal Oceans Protection Plan, the federal Whales Initiative and other relevant initiatives that might exist in the future that have a role for marine terminal operators (e.g., related to vessel noise management). Notify, at a frequency

Federal Conditions Section	CEAA 2012 linkage	BC EAO Valued Component	Key Mitigation Measures
			determined in consultation with the parties responsible for these measures and monitoring, these parties of the Proponent's continued interest in participating in any new or existing measures and monitoring. Report on this annually. If the Proponent has not participated in these measures or monitoring, the Proponent will provide justification for why it has not participated; and k) Report annually throughout operations the following information to the Agency: 1. the total number of LNG carrier calls to the jetty per year, vessel sizes (expressed in conventional dimensions), vessel ages and primary fuels (diesel, LNG, other); 2. the total number of bunkering vessel calls to the jetty per year; 3. the number of tugs escorting LNG carriers to the jetty; and 4. the number of LNG vessels loaded for export.
Migratory Birds	5(1)(a)(iii)	Wildlife – Migratory Birds	• Carry out all phases of the Project in a manner that protects migratory birds and avoids harming, killing or disturbing migratory birds or destroying or taking their nests or eggs. • Consider Environment and Climate Change Canada's Avoidance Guidelines to reduce the risk to migratory birds. • Carry out all phases of the Project in compliance with the *Migratory Birds Convention Act*, 1994, the Migratory Birds Regulations and the *Species at Risk Act*. • Provide notice to Indigenous Groups, as soon as possible, when the Proponent schedule requires that vegetation clearing activities occur during nesting periods. • Avoiding work in areas or during times where tidal water levels are such that barges or vessels would ground or strike the bottom, particularly where sensitive benthic habitats such as mudflats or estuarine marshes may be present. • Delineate clearing boundaries prior to the commencement of Construction and respect those boundaries during construction to manage adverse effects on wetlands. • Manage surface water and avoid erosion or sedimentation to maintain hydrology of adjacent wetlands and protect water quality. • Revegetate disturbed soils and temporary workspaces with native plants compatible with surrounding vegetation communities. • Offset direct loss of wetland and riparian vegetation and ecosystems through restoration, enhancement, and creation of wetland and riparian ecosystem, and identify opportunities to include wildlife and migratory bird habitat enhancement measures into habitat offsetting plan. • Salvage plants from wetlands affected by Construction and translocate to wetland restoration sites. • Plant native species compatible with surrounding vegetation communities, in consultation with Indigenous Groups and including incorporation of traditional use plants. • Conduct a monitoring program to assess biological, hydrological, and structural characteristics of newly established, restored, and/or enhanced wetland areas to determine the success of mitigation based on performance standards. • Implement corrective actions if the restored and/or enhanced wetlands do not fulfill performance standards. • Implement long-term monitoring and adaptive management after performance standards have been achieved for wetland mitigation sites, to maximize the success of wetland enhancement/creation. Where lighting is not standardized based on navigational and safety requirements, strategies to minimize glare such as direction, timing and intensity will be employed. Wetland Compensation Plan: a) The plan should take into account ECCC's Operational Framework for Use of Conservation Allowances, and habitat functions for wildlife, including migratory birds and species at risk; b) Wetland mitigation measures should prioritize wetland restoration over enhancement or creation and prioritize on-site wetlands over off-site wetlands.

Federal Conditions Section	CEAA 2012 linkage	BC EAO Valued Component	Key Mitigation Measures
			c) Project activities should be conducted in a manner that refrains from environmental effects on wetland functions, following the mitigation hierarchy of avoid, minimize, on-site restoration, offset. d) The Proponent should conduct pre-construction surveys to identify wetland functions to inform the design of the Wetland Compensation Plan and follow-up monitoring program. e) The Wetland Compensation Plan and follow-up monitoring program need to be designed to ensure any loss of wetland functions are appropriately compensated (i.e., using the principal of equivalency or "like-for-like" offsetting), including through the design of appropriate criteria by which functions will be measured (e.g., abundance, distribution) in order to meet the objective of no net loss as per the Federal Policy on Wetland Conservation (Government of Canada, 1991); f) The plan should be developed and implemented to the satisfaction of a Qualified Professional, in consultation with government agencies and Indigenous Groups. g) The plan should include adaptive management strategies, performance standards, reporting requirements, and the design and duration of an appropriate follow-up monitoring program, as determined by a QP, including a minimum of five years annual monitoring, to ensure that all compensatory wetland sites meet or exceed performance standards for wetland function and provide a higher value and larger area (than the area described in Table 4.7-11 in the Application)than the wetland habitat it is replacing.
		Wildlife - Barn Owl	Barn Owl Management Plan that identifies / requires: a) Nocturnal and diurnal pre-construction surveys, including identification of potentially suitable roosting habitat, structures, or buildings, as well as design of avoidance strategies and adaptive management measures; b) Mitigations related to sensory disturbance, including acoustic screens, timing, and setback requirements, where there is evidence of barn owls roosting (e.g., pellets, white wash, adult territorial calls); c) The type(s) of physical barriers to be installed, locations, and maintenance regime; and d) Annual reporting to assess mitigation effectiveness and any need for adaptive management measures.
		Wildlife – Northern Red-legged Frog	The Proponent shall develop in consultation with Indigenous Groups and Environment and Climate Change Canada measures to mitigate project effects on northern red-legged frog (*Rana aurora*). In doing so, the Proponent must have a QP: a) Conduct pre-construction surveys to identify breeding habitat for northern red-legged frog; b) Establish no work buffer zones for habitat identified, taking into account British Columbia's Guidelines for Amphibian and Reptile Conservation during Urban and Rural Land Development in British Columbia, except where required to construct project components; c) Salvage and relocate northern red-legged frog to suitable habitat prior to conducting any construction activities within the habitat where frogs have been identified taking into account British Columbia's Best Management Practices for Amphibian and Reptile Salvages in British Columbia.
Indigenous Health	5(1)(c)(i) 5(1)(c)(iii)	Air Quality	Air Quality Management Plan 1. Identify mitigation measures, including those for reducing fugitive dust and air quality emissions from sources identified in the Application, measures shall include the following: a) Routine maintenance of vehicles and idling restrictions of vehicles/vessels during construction when not in use; b) Require reduced engine use of marine vessels at the terminal during operations when safe to do so; and

Federal Conditions Section	CEAA 2012 linkage	BC EAO Valued Component	Key Mitigation Measures
			c) Implement a designed leak detection and repair programs for the Project's LNG conveyance system. 2. LNG carriers and bunkering vessels calling at the Project must have a mechanism to handle boil-off gas to prevent venting to the atmosphere, except in emergency circumstances as determined by the vessel's Captain, its pilot, or in accordance with an emergency response plan. 3. Determine the frequency with which the plan should be reviewed in consultation with relevant authorities and include any additional or modified mitigation measures the Proponent will implement. Provide these additional or modified mitigation measures to the Agency including a description of these measures, planned timing of implementation, and estimated reductions in air emissions or fugitive dust associated with these measures. If no measures are available, the Proponent shall provide justification for why not. 4. Identify how the Proponent is participating (where possible and operationally / economically feasible) in the identification and implementation of regional environmental management measures and cumulative effects monitoring to manage Air Quality, including relevant initiatives that might exist in the future that have a role for marine terminal operators (e.g., related to vessel Air Quality management). Notify, at a frequency determined in consultation with the parties responsible for these measures and monitoring, these parties of the Proponent's continued interest in participating in any new or existing measures and monitoring. Report on this annually. If the Proponent has not participated in these measures or monitoring, the Proponent will provide justification for why it has not participated. Non-LNG-Fueled Vessel Limitation: Limit the number of LNG vessels, excluding LNG barges driven by tugs, calling on the jetty that use crude oil-based fuels (such as diesel) as their primary fuel shall not exceed 13 calls annually.
	5(1)(c)(i) 5(1)(c)(iii)	Noise	Noise Management Plan: • Measures to mitigate noise effects, including effects to uses of lands and water by Indigenous groups: • Advise nearby residents of construction schedule (at least several days in advance of works); • Schedule construction events to reduce disruption to them. The Proponent will consult with nearby residents and Indigenous groups using the area, and attempt to schedule particularly noisy activities to minimize disruption; and • Implement a complaint resolution process.
CULRTP and Socio-Economic Conditions	5(1)(c)(i) & (iii) 5(2)	Marine Use & CULRTP	Marine Communication Plan (Figure 3 of CPD; Schedule D) The plan will identify: a) Procedures to notify Indigenous Groups and other marine users of planned activities associated with the Project; b) The type of information that will be communicated to Indigenous Groups and other marine users, including anticipated traffic schedules and the timing of distribution of this information as it relates to the Project; and c) Procedures for Indigenous Groups and other marine users to provide feedback to the Proponent on adverse effects related to navigation as result of project activities and procedures for the Proponent to document and respond in a timely manner. Marine Access and Transportation Plan (Figure 1 of CPD to Sand Heads)

Federal Conditions Section	CEAA 2012 linkage	BC EAO Valued Component	Key Mitigation Measures
			The Plan will identify the following: d) Marine uses and navigation in the Project area, including commercial and non-commercial routes and use areas, Indigenous traditional use, and fishing areas and harvesting areas, including those identified through DFO fishing licences under the Fisheries and Oceans Canada's *Aboriginal Communal Fishing Licences Regulations* as communicated by Indigenous Groups, and DFO via any publicly accessible information on recently issued licences under this regulation, and any associated timing windows; e) Methods to coordinate activities and communicate with other marine users and regulators, including mechanisms for Indigenous groups to conduct two-way communication with the Holder in real-time about FSC fishing windows to inform the activities described in f (2) and f (3); f) In-Water Construction, habitat offsetting and Operations areas, activities, schedules and planned annual shutdowns of the jetty for maintenance, marine safety protocol(s) and their implementation procedures to maintain navigation and safety; As part of the Plan, the holder must: a) review annually at a minimum three months prior to the start of the calendar year, in consultation with Indigenous groups, and taking into account the most up-to-date publicly posted DFO information on fishing licences issued under the Fisheries and Oceans Canada's Aboriginal Communal Fishing Licences Regulations,the anticipated locations and timing windows for Fisheries and Oceans Canada fishing licences under the *Aboriginal Communal Fishing Licences Regulations* and other Indigenous traditional uses identified during the development of the plan and update this information as needed b) Develop and describe procedures to receive complaints from Indigenous groups and other marine users on adverse effects related to navigation and marine use related to project activities from project area to Sand Heads, including marine shipping and procedures to document and respond to complaints. c) Describe procedures, safety training for Indigenous Groups and other measures to address the safety of marine users, fishers and construction personnel and to minimize the likelihood of vessel collisions during construction and operations. d) Provide opportunities for Indigenous Monitors to participate in monitoring during FSC windows to determine the effectiveness of mitigation measures established in the Plan; e) Determine frequency at which the plan will be reviewed and updated. f) Develop measures to mitigate the project effects on Indigenous traditional use activities, including Indigenous fishers operating under Fisheries and Oceans Canada fishing licences under the *Aboriginal Communal Fishing Licences Regulations* (Figure 2 of CPD to Sand Heads). Measures will include, but are not limited to, the following: 1. adjusting the LNG carrier call schedule annually to reduce the number of LNG carrier transits to and from the marine jetty during anticipated timing windows for DFO fishing licences under the Fisheries and Oceans Canada's Aboriginal Communal Fishing Licences Regulations that are updated annually as part of the Marine Access and Transportation Plan (see bullet e), to the extent that these adjustments do not interfere with operational requirements. 2. synchronizing bunker vessel arrivals at and departures from the marine jetty with regularly scheduled marine traffic not associated with the Designated Project when Indigenous fishers are operating under Fisheries and Oceans Canada fishing licences under the Aboriginal Communal Fishing Licences Regulations on the Fraser River from Sand Heads through the Designated Project area, unless not feasible for technical or safety reasons; 3. implementing protocols to adjust LNG carrier arrival and departure times at the marine jetty while still remaining within the allotted vessel loading window when Indigenous fishers are operating under Fisheries and Oceans Canada fishing licences under the Aboriginal Communal Fishing Licences Regulations on the Fraser River from Sand Heads through the Designated Project area, as communicated by Indigenous groups and other relevant authorities; and 4. providing opportunities for safety training for Indigenous groups related to marine navigation in the marine terminal area (Figure 1 of the CPD). g) Determine the frequency with which the Plan and the measures to mitigate project effects on Indigenous traditional use activities on the Fraser River from Sand Heads through the Project area should be reviewed in consultation with Indigenous Groups and relevant authorities and include any additional or modified mitigation measures

Federal Conditions Section	CEAA 2012 linkage	BC EAO Valued Component	Key Mitigation Measures
			the Holder will implement. When doing the review the Proponent should take into account updated information in the Marine Access and Transportation Plan, complaints received, and results of the follow up program pertaining to adverse effects on CULRTP. In each calendar year, the Tilbury Marine Jetty will receive a maximum of 365 LNG vessel calls, of which a maximum of 68 will be LNG carrier calls. Participation in Regional Initiatives for Current Use of Lands and Resources for Traditional Purposes Identify how the Proponent is participating (where possible and operationally / economically feasible) in the identification and implementation of regional initiatives, including as part of the Oceans Protection Plan, or equivalent, related to effects on current use of lands and resources for traditional purposes as a result of marine shipping. Notify, at a frequency determined in consultation with the parties responsible for these measures and monitoring, these parties of the Proponent's continued interest in participating in any new or existing measures and monitoring. Report on this annually. If the Proponent has not participated in these initiatives, the Proponent will provide justification for why it has not participated.
		Air quality, noise, lighting, water quality, fish and fish habitat, marine mammals, heritage, wildlife, vegetation	See key mitigation measures recommended in the associated valued component rows in this table.
Physical and Cultural Heritage	5(1)(c)(ii)	Heritage	a) Conducting an Archaeological Impact Assessment or other field investigations in areas with high archaeological potential landward of the dyking system prior to Construction. b) Realign or redesign Project components to avoid Heritage Resources, where possible, should any be found during subsequent studies or during Construction. c) If avoidance is not feasible, implementing alternative protection methods including protective coverings, stabilization and physical barriers aimed to reduce project effects on Heritage Resources. d) If effects cannot be avoided or minimized, effects will be reduced through a variety of measures including surface artifact collection, additional inventory studies or systematic data recovery (e.g., excavation, detailed recording and documentation, construction surveillance or monitoring). e) Implement a Heritage Resources Chance Find Management Procedure to ensure preservation and proper management of Heritage Resources that are unexpectedly encountered during Project activities. The document will include general guidelines and specific steps to follow for the appropriate response to the discovery of known or suspected heritage materials during the course of Project activities.
		Cultural Heritage	Develop, prior to construction, nation-specific measures to address the effects on tangible and intangible cultural losses caused by the construction and operation of the Project, in consultation with those Indigenous Groups experiencing effects, as described in the EAO's Assessment Report. The Proponent must: a) invite those Indigenous Groups to co-lead the development of these measures;

Federal Conditions Section	CEAA 2012 linkage	BC EAO Valued Component	Key Mitigation Measures
			b) consider developing or contributing to Indigenous-led programs to preserve and enhance cultural heritage; c) implement the measures during all phases of the Project; d) ensure that confidential information is protected; and e) report on the Proponent's discussions with the Indigenous Groups, including the level of satisfaction of Indigenous Groups on the implementation of the measures.
Accidents and Malfunctions	19(1)(a)		Emergency Response Plan (Figure 1 of CPD;) Plan must identify the following: a) Description of the emergency response training, including for spills and fires, that the Proponent will provide for their personnel. The Proponent will offer opportunities to relevant authorities and Indigenous Groups to participate in training. The Proponent will update the plan to address any concerns from the training and provide updates to parties that were consulted on the plan; b) Potential accidents and malfunctions, including spills and fires, and the measures to mitigate adverse effects and operating procedures to prevent them; c) Description of the integrated response planning, including roles and responsibilities, and equipment requirements, between proponent and government agencies / local government / emergency response departments; and d) implementation of exercises of the Spill Response Plan in cooperation with relevant authorities beginning prior to loading LNG and at subsequent intervals determined in during the development of the plan, and incorporate learnings from the exercise into the spill response component of the emergency response plan. Communication plan to notify Indigenous Groups and marine users related to the accidents and malfunctions occurring within the marine terminal area (Figure 1 of CPD) The plan must include the following: a) Types of accidents and malfunctions requiring notification; b) Manner in which notification will occur; and c) Effects to access, including Indigenous use (e.g., duration and extent of exclusions zone for fishing if an incident occurs). Marine shipping Emergency Response Outreach Program (Figure 3 of CPD) The program must include: a) identification of equipment that the proponent could provide to assist with marine shipping spill or emergency response associated with LNG vessels that have called on the jetty that are travelling within Figure 3 of CPD; b) delivery or arrangement by Proponent for LNG safety related courses for the CCG, Indigenous Groups, provincial and municipal government personnel, industry sector, and community responders who may request training; and c) participation of Proponent in CCG marine shipping incident response coordination and exercises if requested.
Follow Up Program	54(4)(b)	Multiple	Water Quality

Federal Conditions Section	CEAA 2012 linkage	BC EAO Valued Component	Key Mitigation Measures
			• Turbidity monitoring will be implemented during in-water works, including pile driving, and compared against B.C. Water Quality Guidelines. If turbidity levels exceed these guidelines, pre-determined decision criteria with specific management actions will be followed. River Processes Monitoring (Area shown in Figure 3.2 of Appendix 4.1-1, Appendix A of TJLP's Application for an Environmental Assessment Certificate, 2019): • Annual soundings; and • Reach wide bathymetry (every 5 years). Fish and Fish Habitat • Follow up program for effectiveness of fish and fish habitat mitigations. Marine Access and Transportation Plan • Follow up program for Marine Access and Transportation Plan - to monitor and follow up on potential effects to CULRTP, including fishing. Lighting and Birds • The Proponent shall develop, prior to construction and in consultation with Environment and Climate Change Canada and Indigenous Groups, and other relevant authorities, and implement during all phases of the project, a follow-up program in the Marine Terminal Area to verify the predictions of the environmental assessment as it pertains to the effect of artificial light on coastal birds. The follow-up program will assist in evaluating the extent to which mortalities occur in the presence of mitigation and will inform the subsequent need for adaptive management. The effectiveness of adaptive management, if required, will be measured against initial monitoring results and best available industry standards, at the time of implementation. The follow-up program shall be developed in consideration of Environment and Climate Change Canada's methods and standards, and best available guidelines, including but are not limited to provincial and federal standards for wind farms; and Fatal Light Awareness Program (FLAP) Canada. Air Quality A follow up program for Air Quality during Operations including triggers for management action, in consultation with ECCC, Metro Vancouver and Indigenous Groups, taking into account applicable government air quality objectives.

Multiple		Multiple	Indigenous Monitors
			• Discuss and determine, in consultation with Indigenous groups, opportunities for Indigenous group participation in the implementation of required monitoring.
			• When determining opportunities, identify:
			  ○ all monitoring activities required in conditions including those of follow-up programs.
			  ○ if opportunities for Indigenous monitor participation in certain monitoring does not exist, an explanation for why.
			  ○ how Indigenous monitors will be involved in any monitoring (including the location, frequency, timing and duration of their participation).
			  ○ how the Holder will support Indigenous monitor participation including by providing training, equipment, access to the project site.

APPENDIX 2 – ENVIRONMENTAL ASSESSMENT METHODOLOGY AND OVERVIEW OF POTENTIAL EFFECTS

1 ENVIRONMENTAL ASSESSMENT METHODS

In the Environmental Assessment Office's (EAO) Assessment Report (EAO's Report), the EAO assessed whether the TMJ is likely to have significant adverse environmental, economic, social, heritage and health effects, including cumulative effects. The EAO's assessment included contemplation of the mitigation measures proposed in the Application and Marine Shipping Assessment, or otherwise developed through the provincial and federal Environmental Assessment (EA) processes, in addition to conditions proposed by the EAO and recommended Key Mitigation Measures (KMMs) under the *Canadian Environmental Assessment Act*, 2012 (CEAA 2012).

To conduct this assessment, the EAO followed the methods outlined in its *Guideline for the Assessment of Valued Components and Assessment of Potential Effects* (2013). This section provides a brief summary of the methodology followed. The methodological steps in B.C.'s EA process are shown in Figure 23.

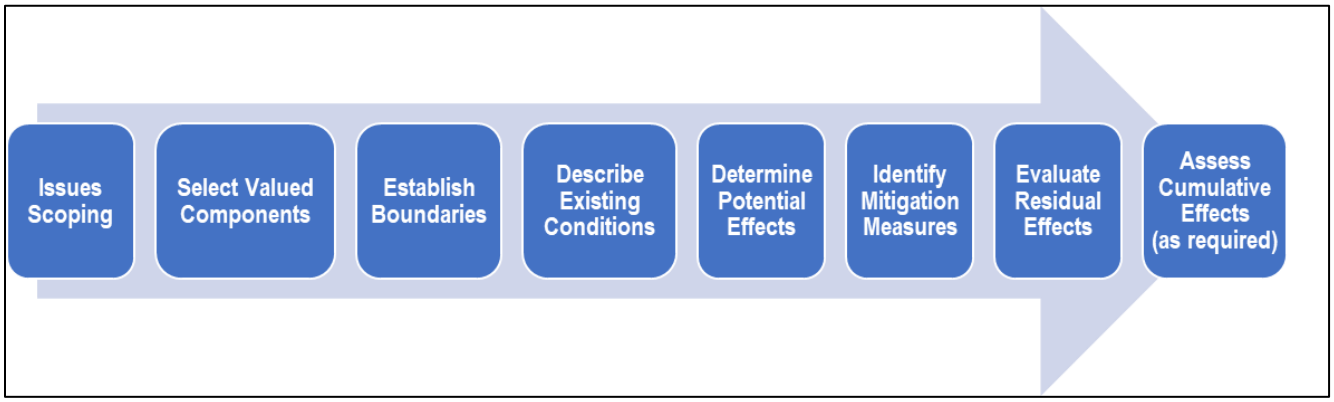

Figure 23: EAO's Environmental Assessment Methods

EA in B.C. uses a values-based framework to promote a comprehensive, yet focused, understandable, and accessible assessment of the potential effects of proposed projects. This framework relies on the use of Valued Components (VCs) and Pathway Components (PCs) as a foundation for the assessment. VCs are components of the natural and human environment that are considered by the proponent, public, Indigenous Groups, scientists and other technical

specialists, and government agencies involved in the assessment process to have scientific, ecological, economic, social, cultural, archaeological, historical or other importance.

Appropriate VCs and PCs are identified and selected during the Pre-Application phase of the EA. Ultimately, the VCs and PCs required to be in the Application are established by the EAO upon finalization of the AIR. Much of the early part of the Pre-Application phase is focused on consultation on the VCs, PCs, key indicators, study area boundaries and technical requirements with Working Group (Working Group) members (including Indigenous Groups) and the public.

For the MSA, subject matter experts in the technical disciplines identified the VCs and PCs that represented key issues when considering the potential for them to interact with the marine shipping activities from the Sand Heads location to the 12-mile nautical limit. The VCs and PCs were selected based on:

- The VCs or PCs is known or suspected to be present in the Marine Shipping Assessment Area;
- Working Group comments provided during the EAC Application review;
- Predicted interactions between shipping activities and the marine and human environments; and
- Aboriginal Interests.

The identified VCs or PCs, along with their selection rationale for inclusion in the MSA, were reviewed by the EAO and Working Group prior to finalization of the Tilbury Marine Shipping Assessment (MSA) Information Request. The process is further detailed in the *Guideline for the Assessment of Valued Components and Assessment of Potential Effects (2013).*

2 RECEPTOR AND PATHWAY COMPONENTS

Pathway Components are part of the pathway between a proposed project and the receptor components, which are the ultimate receptor for effects from a proposed project.

For example, sediment-laden discharge from a project to a stream may adversely affect water quality and benthic habitat and these changes may consequently affect the health and survival of fish that depend on those habitat attributes. In this example, water quality and benthic habitat would be pathway VCs and fish health and survival would be the receptor VC.

The EAO considered the potential effects of the changes to both pathway and receptor components through the assessment of VCs in this Report.

3 STUDY BOUNDARIES

Study boundaries serve to define the scope or limits of the assessment and encompass the areas within which TMJ is expected to have potential effects of the selected VCs.

The study areas for the original Application generally include the:

- Project area or Project footprint – the area directly disturbed by TMJ's physical works and activities;
- Local Assessment (LAA) – varies by VC, the area surrounding and including the Project area, where there would be reasonable potential for TMJ-related activities to interact with and potentially have an adverse effect on the VC; and
- Regional Assessment Area (RAA) – varies by VC, provides the regional context for the assessment of potential TMJ-related effects within the LAA, in most cases encompassing the area within which potential residual adverse effects of TMJ would likely to cumulate with effects of other project and activities. The cumulative effects assessment area may include the RAA as well as areas outside of the RAA.

The MSA encompasses the inbound and outbound shipping lanes that would be used by vessels associated with TMJ transiting between Sand Heads and the 12-nautical mile Canadian territorial limit (the MSA Area). The spatial boundaries used in the assessment vary to reflect the potential extent of interaction between VCs and transiting vessels and are defined by each of the following areas:

- MSA LAA – encompasses the area within which potential TMJ-related disturbances from transiting vessels could affect VCs.
- MSA RAA – is the area surrounding and including the MSA LAA and provides context for assessment of the potential marine shipping effects and is used as a boundary for assessing potential cumulative effects. MSA RAAs were selected to be larger in scope, encompassing an area broader than the immediate shipping corridor, to consider potential wider range direct and indirect effects of TMJ.

The temporal boundary is defined as the life of the project, from construction through decommissioning (phases described below). For the effects assessments within this Report, the temporal boundaries are as follows:

- Construction - 3 years;
- Operations - minimum of 30 years; and
- Decommissioning - 1 year.

Construction: The phase of TMJ during which physical alteration of land, vegetation or any other aspect of the natural environment, occurs.

Operations: The phase of TMJ beginning on the date where full commercial operations and marine shipping to customers begins. The operations phase ends when commercial operations permanently cease, and the decommissioning phase begins.

Decommissioning: The phase of TMJ where all commercial operations cease and the removal of marine shipping facilities and infrastructure are decommissioned, demolished and/ or removed from the TMJ site. Reclamation activities including foreshore slope protection and re-planting of vegetation would be conducted as part of decommissioning.

As a substituted EA, the EAO conducted the EA for TMJ in accordance with the Memorandum of Understanding between the Canadian Environmental Assessment Agency (now known as the Impact Assessment Agency of Canada [the Agency]) and the B.C. Environmental Assessment Office on Substitution of Environmental Assessments (CEA Agency, 2013). The study boundaries were established to inform the assessment of environmental effects described in Section 5(1) and 5(2) of CEAA 2012.

4 ASSESSMENT OF VALUED COMPONENTS

For each selected VC (or grouping of VCs), the Application describes the existing conditions within the study area in sufficient detail to enable potential TMJ-VC interactions to be identified, understood and assessed. The description of existing conditions includes, as relevant, natural and/ or human-caused trends that may alter the environmental or socio-economic setting irrespective of the changes that may be caused by the project or other projects and activities in the local area.

The assessment then considers the potential interactions of the project with the VC, and the potential effects that could arise. These potential effects are identified and described, and an analysis is presented of the potential adverse effects resulting from the project.

The assessment then describes the mitigation measures that would be incorporated into TMJ, including: site and route selection; project scheduling; project design; and construction and operation procedures and practices.

Consistent with the B.C. Ministry of Environment and Climate Change Strategy (ENV) Environmental Mitigation Policy and Procedures, the EAO considers mitigation to be any practical means or measures taken to avoid, minimize, restore on-site, compensate or offset potential adverse effects. Also described are standard mitigation, BMPs, EMPs, contingency plans, Emergency Response Plans, and other practices proposed to be implemented.

The residual effects on each VC (or grouping of VCs) are then identified. Residual effects are those effects remaining after the implementation of all mitigation measures, and are, therefore, the expected consequences of TMJ for the selected VCs. To inform the determination of the significance of a residual (adverse) effect, it is necessary to characterize the residual effect.

Residual effects are usually described using standard criteria: context, magnitude, extent, duration, reversibility and frequency. These criteria, as well as likelihood, are summarized in the box below, and definitions for TMJ are provided in Appendix 5.

Summary of Criteria for Characterizing Residual Effects

Context refers primarily to the current and future sensitivity and resilience of the VCs to change caused by the Project. Consideration of context draws heavily on the description of existing conditions of the VC, which reflect cumulative effects of other projects, and activities that have been carried out, and especially information about the effects of natural and human-caused trends in the condition of the VC.

Magnitude refers to the expected size or severity of the residual effect. When evaluating magnitude of residual effects, consider the proportion of the VC affected within the spatial boundaries and the relative effect (e.g., relative to natural annual variation in the magnitude of the VC or other relevant characteristic).

Extent refers to the spatial scale over which the residual effect is expected to occur.

Duration refers to the length of time the residual effect persists (which may be longer than the duration of the physical work or activity that gave rise to the residual effect).

Reversibility pertains to whether or not the residual effect on the VC can be reversed once the physical work or activity causing the disturbance ceases.

Frequency refers to how often the residual effect occurs and is usually closely related to the frequency of the physical work or activity causing the residual effect.

Likelihood refers to whether or not a residual effect is likely to occur. It may be influenced by a variety of factors, such as the likelihood of a causal disturbance, occurring or the likelihood of mitigation being successful. Generally speaking, the residual effects described in the assessment comprise the best prediction of what is likely to occur as a result of a proposed Project, assuming a suite of proposed mitigation is implemented.

The identification of significant adverse residual effects is a requirement of the Act. When determining significance for each VC, consideration should be given to how each of the criteria for characterizing residual effects informs the determination of significance. Significance may be determined based on a quantitative or qualitative threshold that describes the point beyond which a residual effect would be considered significant. In some instances, thresholds established for some VCs by legislation, regulation, or regulatory standard are used. Significance is critical for making an informed decision about proposed projects; as it is important to understand the characteristics and significance of project-specific residual effects in order to also understand the relative contribution of a project to cumulative effects.

Once the residual effect prediction has been described in terms of significance and likelihood, it is important to explain the level of confidence in each prediction. The level of confidence, typically based on expert judgement, characterizes the level of uncertainty associated with both

the significance and likelihood determinations. Specifying the level of confidence associated with these determinations allows the decision-maker to better evaluate the risk associated with TMJ. The assessment of confidence also informs the need for and scope of monitoring or other follow-up programs, including adaptive management.

Significance was determined for the residual effects of TMJ on receptor VCs, as well as for the cumulative effects. This is critical for making an informed decision about TMJ. It is important to understand the characteristics and significance of the potential project-specific residual effects in order to also understand the relative contribution of TMJ to cumulative effects. The cumulative effects assessment is discussed further below.

5 CUMULATIVE EFFECTS ASSESSMENT

If the proposed project is expected to result in any residual adverse effects on the selected VC, there is a need to consider cumulative effects. It is important to note that this consideration must be made for all residual adverse effects, not only for those predicted to be significant.

Where there is a residual adverse effect, the assessment of cumulative effects for reviewable projects should consider other past, present and reasonably foreseeable projects and activities, which were identified in the AIR. Any cumulative effects that are likely to result from the proposed project in combination with other physical activities that have been or will be carried out were considered as part of the assessment, consistent with paragraph 19(1)(a) of CEAA 2012.

The general steps for a cumulative effects assessment are shown in Figure 24 below. The likelihood of a cumulative interaction with other projects and activities, and TMJ's contribution to the overall cumulative effect, should together inform the cumulative effects assessment undertaken.

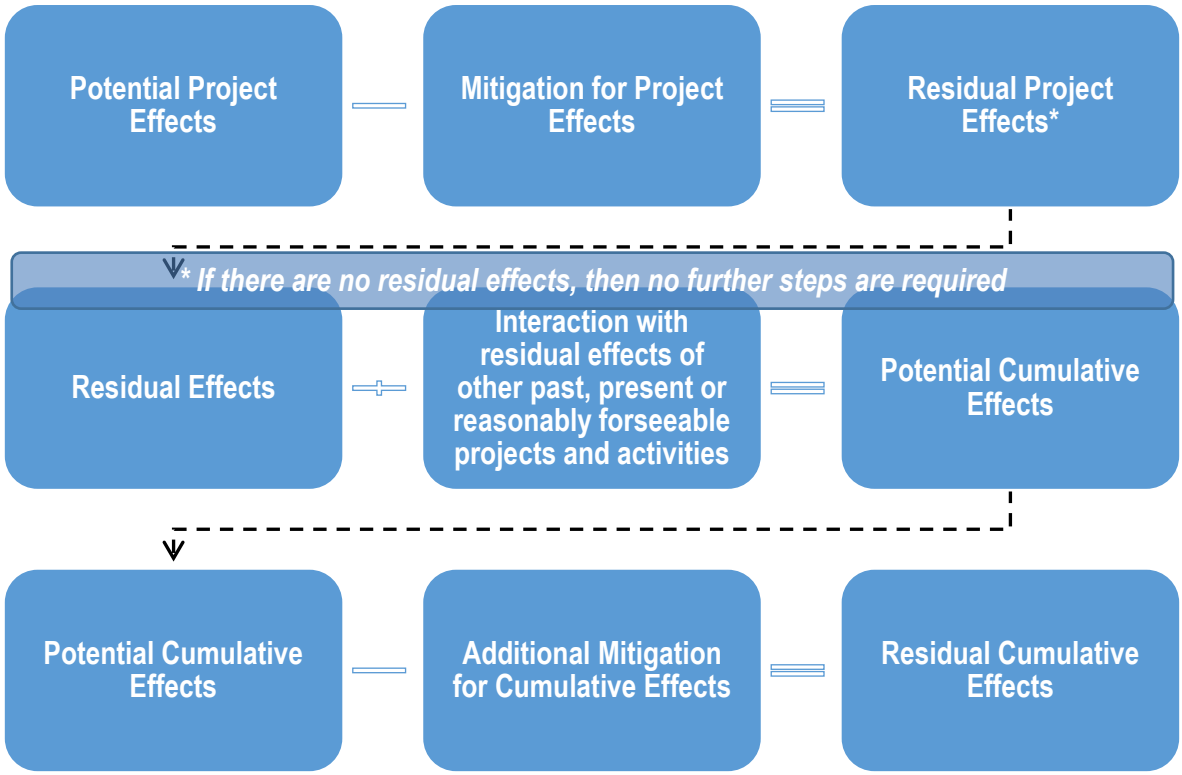

Figure 24: Steps to Determine Residual Effects and Cumulative Effects

The EAO evaluated cumulative effects for TMJ by considering how residual effects associated with TMJ would be expected to interact with the residual effects of other past, present and reasonably foreseeable projects and/ or activities included in TJLP's cumulative effects assessments, as described in Section 3.5 of the Application and Section 2.5 of the MSA report and Section 2.4 of the BVSA. In addition, the EAO also considered other reasonably foreseeable projects, depending on the VC, that were not known at the time of preparing the AIR or TJLP's EAC Application for TMJ. Projects and activities are discussed where relevant under the cumulative effects section for each VC in this Report.

APPENDIX 3 – DREDGE DISPOSAL ALTERNATIVES

Table 34: Summary of dredge disposal alternatives, VC interactions and effects identified in the Alternatives Assessment Supplemental Report – WesPac Tilbury Marine Jetty Project.

Dredge Disposal Alternative	Summary	VC Interactions and Potential Effects
Alternative 1: Construction Material for Habitat Creation and Enhancement	Dredged materials would be preferentially re-used within the TMJ area for shoreline restoration purposes to the extent practicable and dependent on the geotechnical and chemical suitability of the material. Suitable dredge material would be used to build and contour shoreline restoration features to construct 1.2 ha of estuarine marsh and mudflat habitat. The use of dredge material for habitat creation and enhancement is preferred as it creates a beneficial end use (new habitat) for fish, vegetation and wildlife and is near the dredge location.	**Water Quality** • Temporary release of sediment that may affect surface water quality, sediment quality and aquatic health. • Potential increase in total suspended solids (TSS) and turbidity. **Fish and Fish Habitat** • No anticipated negative effects to fish and fish habitat. • Restoration and enhancement of 1.2 ha of estuarine marsh and mudflat habitat would have a net positive benefit to fish and fish habitat. **Marine Mammals** • No anticipated negative effects to marine mammals. • Restoration and enhancement of 1.2 ha of estuarine marsh and mudflat habitat would have a net positive benefit to fish and fish habitat which could have indirect positive effects to marine mammals. **Air Quality** • Potential increase in fugitive particulate emissions including wind erosion from temporary stockpiles and handling of dredged sediment if it dries out. • Potential increase in combustion emissions, including GHG emissions, from marine vessels and diesel-powered construction equipment to be used for habitat restoration. **Vegetation** • Positive effect on vegetation by creating estuarine marsh habitat. Restoration and enhancement of 1.2 ha of estuarine and mudflat habitat would have a net positive benefit to marine plants. **Wildlife and Wildlife Habitat** • Positive effect on wildlife and migratory birds by creating new habitat and enhancing existing riparian habitat. **Socio-Community** • No effects anticipated. **Land and Marine Resource Use** • Increase in marine vessel traffic for transport of dredged sediments could temporarily affect navigation, and area access and use by commercial and non-commercial marine vessels. • Changes in distribution and abundance of marine mammals and coastal birds may affect marine tourism. • Changes in distribution and abundance of fish species could affect commercial and recreational fish harvesting and guided sport fishing. **Current Use of Lands and Resources for Traditional Purposes** • Effects to the current use of lands and resources for traditional purposes by Indigenous Groups from use of dredged materials for habitat restoration are not expected.
Alternative 2: Commercial Upland Use Temporarily stockpiling on-site for subsequent re-use and/ or re-sale off-site	Sediment sampling has indicated that a large proportion of the dredged material is similar to the dredged material that is routinely removed as part of the navigational dredging program in the Fraser River near the TMJ site. Dredged	**Water Quality** • Temporary storage of dredged sediment on-site or at an off-site facility prior to transportation for upland use (i.e., for construction) could result in the release of sediments into the aquatic environment if unmitigated, potentially affecting surface water quality, sediment quality and aquatic health. • Upland onsite or offsite storage locations works would be isolated from the aquatic environment by a dike, and with erosion and sediment control mitigation measures appropriate to the site-specific conditions of the end-use site. Therefore, effects to water quality are not expected with the implementation of mitigation.

Dredge Disposal Alternative	Summary	VC Interactions and Potential Effects
	material from the lower Fraser River is regularly used for fill and as preload for construction purposes. The ultimate use or disposal method for the dredged material would be influenced by the market demand for dredged materials during the time of capital and maintenance dredging. Efforts have been made to identify beneficial commercial uses for the dredge material near the TMJ area, although no specific commitments have been made at this time. Sand sold for commercial upland use would be transported up to 50 km from the TMJ site. Although there would be additional costs associated with transporting material off-site, selling or donating the material for use off-site reduces the potential for adverse environmental interactions as well as the complexity of obtaining environmental permits for ocean disposal. As the customer base for commercial use of the construction and maintenance dredge material has not been secured at the time of preparing the Alternatives Assessment, TMJ will continue to investigate the potential commercial markets for the dredge material. The ability to use the material offsite for commercial purposes would depend on regional projects occurring during TMJ construction and operational periods.	• Temporary storage of dredged sediment prior to transportation for upland use could result in the release of sediments into the aquatic environment that may affect surface water quality, sediment quality and aquatic health. **Fish and Fish Habitat** • No anticipated negative effects to fish and fish habitat in the Fraser River. • Upland onsite or offsite storage locations works would be isolated from the aquatic environment by a dike and would be undertaken in accordance with erosion and sediment control mitigation measures appropriate to the site-specific conditions of the end-use site. • Temporary storage of the dredge sediment on-site or at an off-site facility would be managed such that sediment laden runoff would not enter fish bearing habitat, consistent with the federal *Fisheries Act*. As such, no anticipated negative effects to fish and fish habitat in the Fraser River is expected from temporary material storage. **Marine Mammals** • No anticipated negative effects to marine mammals. **Air Quality** • Potential increase in combustion emissions, including GHG emissions, from marine vessels (tug assisted barges) transporting dredge material from the TMJ site to the storage/ drying site, assumed to be within 10 km. • Potential increase in fugitive particulate emissions including wind erosion from temporary stockpiles and transportation of dredged sediment if it dries out. **Vegetation** • Fugitive dust from temporary stockpiling and transportation of dredged sediment could result in smothering effects to vegetation. • Introduction and proliferation of invasive plant species from vehicles associated with temporarily stockpiling and transporting dredged sediment for commercial upland use. • No anticipated interactions with marine plants. **Wildlife and Wildlife Habitat** • Dredged sediments would be temporarily stockpiled at either on-site or off-site locations such as sites established by Fraser River Pile and Dredge. Wildlife habitat at these sites has been modified as a result of previous stockpiling activities. Minor habitat alteration may occur due to the deposition of new dredge material; however, deposition of new dredge material is not predicted to change the characteristics of the stockpile area. • Activities associated with offsite stockpiling sediments have the potential to result in incremental disturbance to terrestrial habitat that could be used for foraging or nesting by migratory birds. However, offsite disposal sites, such as the Fraser River Pile and Dredge disposal site, are continually used for the purpose of stockpiling dredge material and are understood to be heavily modified. As such, the habitat is unlikely to provide highly suitable habitat for migratory birds and modification to terrestrial habitat at these locations is expected to negligibly effect migratory birds. • Activities associated with stockpiling sediments have the potential to result in incremental disturbance to terrestrial migratory birds recognizing the heavily modified conditions of the Fraser River Pile and Dredge disposal sites. • Noise and activity from the transportation of dredge material could result in sensory (auditory and visual) disturbance to aquatic birds, migratory birds and terrestrial wildlife. • Road transportation of dredge sediments could result in strikes with terrestrial wildlife, including migratory birds. **Socio-Community** • Increased traffic from road transportation of dredged sediments could temporarily affect access and use of local roads and road capacity. **Land and Marine Resource Use** • Increased traffic from road transportation of dredged sediments could temporarily affect access and use of roads and road capacity for commercial and non-commercial vehicles. **Current Use of Lands and Resources for Traditional Purposes** • Effects to the current use of lands and resources for traditional purposes by Indigenous Groups from the upland use of the dredged material is not expected.

Dredge Disposal Alternative	Summary	VC Interactions and Potential Effects
Alternative 3: Land-based Disposal	Material that cannot be sold or otherwise used for beneficial purposes or contains contaminants or materials not suitable for alternative disposal, may be disposed of at a landfill. Receiving facilities have yet to be identified and could vary depending on the volumes and chemistry of material being sent. Similar to disposing at a commercial location, dredge materials to be disposed of at a landfill would be stored temporarily at a location designated for this purpose along the Fraser River. Materials potentially containing contamination would be separated and isolated from surrounding materials.	**Water Quality** • Temporary storage of dredged sediment on-site or at an off-site facility prior to transportation for upland use (i.e., for construction) could result in the release of sediments into the aquatic environment if unmitigated, potentially affecting surface water quality, sediment quality and aquatic health. • Upland onsite or offsite storage locations would be isolated from the aquatic environment by a dike, and with erosion and sediment control mitigation measures appropriate to the site-specific conditions of the end-use site. Therefore, effects to water quality are not expected with the implementation of mitigation. • Upland works would be isolated from the aquatic environment by a dike, and erosion and sediment control management; therefore, effects to water quality are not expected. • Temporary storage of dredged sediments prior to transportation could potentially result in the release of sediments into the aquatic environment that may affect surface water quality, sediment quality and aquatic health. • Once the dredged material is accepted into the landfill, it would be subject to regulation under the landfill's existing permit, and erosion and sediment control measures would mitigate potential effects to water quality. **Fish and Fish Habitat** • No anticipated negative effects to fish and fish habitat in the Fraser River. • Once the dredged material is accepted into the landfill, it would be subject to regulation under the landfill's existing permit, and erosion and sediment control measures would mitigate potential effects to fish and fish habitat. **Marine Mammals** • No anticipated negative effects to marine mammals associated with upland disposal to a landfill. **Air Quality** • Potential increase in combustion emissions, including GHG emissions, from marine vessels (tug assisted barges) transporting dredge material from the TMJ site to the storage/ drying site, assumed to be within 10 km. • Potential increase in fugitive particulate emissions including wind erosion from temporary stockpiles and transportation of dredged sediment if it dries out. • Potential increase in combustion emissions, including GHG emissions, from haul trucks transporting dredge material to the disposal location within 100 km. **Vegetation** • Fugitive dust from temporary stockpiling and transportation of dredged sediment could result in smothering effects to vegetation. • Introduction and proliferation of invasive plant species from vehicles associated with temporarily stockpiling and transporting dredged sediment to a landfill. • No anticipated interactions with marine plants. **Wildlife and Wildlife Habitat** • Dredged sediments would be temporarily stockpiled at either on-site or off-site locations such as sites established by Fraser River Pile and Dredge. Wildlife habitat at these sites has been modified as a result of previous stockpiling activities. Minor habitat alteration may occur due to the deposition of new dredge material; however, deposition of new dredge material is not predicted to change the habitat characteristics of the stockpile area. • Activities associated with offsite stockpiling sediments have the potential to result in incremental disturbance to terrestrial habitat that could be used for foraging or nesting by migratory birds. However, offsite disposal sites, such as the Fraser River Pile and Dredge disposal site, are continually used for the purpose of stockpiling dredge material and are understood to be heavily modified. As such, the habitat is unlikely to provide highly suitable habitat for migratory birds and modification to terrestrial habitat at these locations is expected to negligibly effect migratory birds. • Activities associated with stockpiling sediments have the potential to result in incremental disturbance to terrestrial migratory birds recognizing the heavily modified conditions of the Fraser River Pile and Dredge disposal sites. • Noise and activity from the transportation of dredge material could result in sensory (auditory and visual) disturbance to aquatic birds, migratory birds and terrestrial wildlife. • Road transportation of dredge sediments could result in strikes with terrestrial wildlife, including migratory birds. **Socio-Community** • Increased traffic from road transportation of dredged sediments could temporarily affect access and use of local roads and road capacity.

Dredge Disposal Alternative	Summary	VC Interactions and Potential Effects
		• Capacity constraints for selected local landfill sites to accept the dredge material would be mitigated through the selection of landfill sites that are licenced to accept the volume of material being sent. **Land and Marine Resource Use** • Increased traffic from road transportation of dredged sediments could temporarily affect access and use of roads and road capacity for commercial and non-commercial vehicles. **Current Use of Lands and Resources for Traditional Purposes** • Land-based disposal of dredged material, including transportation of dredged material to a licensed landfill is not expected to affect the current use of lands and resources for traditional purposes by Indigenous Groups.
Alternative 4: Marine-based Disposal at Sand Heads	If beneficial commercial uses for the dredge material cannot be identified, or disposal at a landfill is not possible, material may need to be disposed of at sea to an applicable location as determined by ECCC requirements for the DAS Regulations permitting process. Sediment sampling conducted during the baseline study to support the Water Quality VC (Section 4.2 of the Application) was designed to meet the ECCC requirements for DAS permitting. These results are presented as Appendix 5.6-2 of the Application and show that a majority of the dredge material would be suitable for disposal at sea. Sand Heads DAS site is the closest marine disposal site near TMJ and was therefore initially selected as an ocean disposal location for the purposes of the EAC Application. However, ECCC has confirmed that Sand Heads disposal site, which is located within SRKW Critical Habitat, is only used for the disposal of sand from the lower reaches of Fraser River navigation channel maintenance. Therefore, material generated by TMJ is not eligible for disposal at Sand Heads. Point Grey (Alternative 5) was added as an alternative ocean disposal site and is considered to be the preferred disposal site.	**Water Quality** • Release of dredged sediments to the Sand Heads Disposal Site may temporarily change water quality at the site by increasing TSS and turbidity in the water column through the introduction and re-suspension of sediments. The Sand Heads Disposal Site is affected by marine disposal activities on an ongoing basis as it is a designated DAS site which routinely receives dredged sediment from the Fraser River navigational dredge program. • Water quality may also change due to the release of contaminants to the water column from the dredged material. A DAS permit for the Sands Heads Disposal Site would require the material to be tested and meet concentration limits for specified parameters, and the requirements for disposal at Sand Heads are more stringent than for other disposal sites because it is located within SRKW critical habitat. • Increase in suspended sediment or contaminant concentrations may affect aquatic health at the disposal site. **Fish and Fish Habitat** • Potential increase in TSS and turbidity (see Water Quality bullets listed above). • Potential mortality to fish and benthic invertebrates. • Potential disturbance or loss of fish habitat. **Marine Mammals** • Potential injury or mortality due to vessel strikes with the dredge vessel and tug-assisted barges during transport of dredge material from the TMJ area to the Sand Heads Disposal Site (a distance of approximately 23.4 km). • Potential behavioral disturbance and/ or acoustic masking due to underwater noise from the dredging vessel, including areas within SRKW critical habitat. • Potential for contaminant uptake (see Water Quality bullets listed above). **Air Quality** Potential increase in combustion emissions, including GHG emissions, from marine vessels (tug-assisted barges) transporting dredge material from the TMJ site to the Sand Heads Disposal Site. **Vegetation** • No anticipated negative effects to vegetation including marine plants. • There are no known occurrences of marine plants at risk at the Sand Heads Disposal Site and the site is continuously disturbed by marine disposal activities thereby reducing the potential for plant growth and proliferation. **Wildlife and Wildlife Habitat** • Deposition of dredge material at the Sands Heads Disposal Site may result in periodic disturbance to aquatic birds, including aquatic migratory birds. **Socio-Community** • No effects anticipated. **Land and Marine Resource Use**

Dredge Disposal Alternative	Summary	VC Interactions and Potential Effects
		• Marine vessel movements for transport of dredged sediments from the TMJ area to Sand Heads Disposal Site could temporarily affect navigation, area access and area use by commercial and non-commercial marine vessels. • Change in distribution and abundance of marine mammals and coastal birds may affect marine tourism. • Changes in distribution and abundance of harvestable fish and seafood species could affect commercial and recreational fish harvesting and guided sport fishing. **Current Use of Lands and Resources for Traditional Purposes** • Marine vessel movements for transport of dredged sediments from the TMJ area to the Sand Heads Disposal Site could temporarily affect navigation of Indigenous fisheries vessels and some preferred locations for fishing. • Musqueam Indian Band has reported disposal at sea affects crabbing. • Effects on air quality, atmospheric noise and visual quality during transport of dredge material for disposal could temporarily affect quality of use experience. • Effects to fish species could affect Indigenous Groups harvesting fish for food, social and ceremonial (FSC) purposes or domestic purposes.
Alternative 5: Marine-based Disposal at Point Grey	Disposal of dredge material at the Point Grey DAS site has been identified as the preferred ocean disposal site. Point Grey was added as an alternative ocean disposal location to address concerns raised Application review regarding potential effects to SRWK critical habitat at the Sand Heads DAS site. The Point Grey DAS site has been used for DAS since the 1930s and receives woodwaste and river silt from the Port of Vancouver and the Fraser River.	**Water Quality** • Release of dredged sediments to the Point Grey Disposal Site may change water quality at the site by increasing TSS and turbidity in the water column through the introduction and re-suspension of sediments. The Point Grey disposal site is affected by marine disposal activities on a regular basis as it is a designated DAS site. • Water quality may also change due to the release of contaminants to the water column from the dredged material. A DAS permit requires the material to be tested and meet concentration limits for specified parameters. • Increase in suspended sediment or contaminant concentrations may affect aquatic health at the disposal site. The Point Grey Disposal Site is located outside of SRKW critical habitat. **Fish and Fish Habitat** • Potential increase in TSS and turbidity (see Water Quality bullets listed above). • Potential mortality to fish and benthic invertebrates. • Potential disturbance or loss of fish habitat. **Marine Mammals** • Potential injury or mortality due to vessel strikes with the dredge vessel and tug-assisted barges during transport of dredge material from the TMJ area to the Point Grey Disposal Site (a distance of approximately 40.5 km). • Potential behavioral disturbance and/ or acoustic masking due to underwater noise from the dredging vessel, including areas within SRKW habitat. • Potential for contaminant uptake (see Water Quality). **Air Quality** • Potential increase in combustion emissions, including GHG emissions, from marine vessels (tug-assisted barges) transporting dredge material from the TMJ site to the Point Grey Disposal Site. **Vegetation** • No anticipated negative effects to vegetation including marine plants. • There are no known occurrences of marine plants at risk at the Point Grey Disposal Site and the site is continuously disturbed by marine disposal activities thereby reducing the potential for plant growth and proliferation. **Wildlife and Wildlife Habitat** • Deposition of dredge material at the Point Grey Disposal Site may result in periodic disturbance to aquatic birds, including aquatic migratory birds. **Socio-Community** No effects anticipated. **Land and Marine Resource Use**

Dredge Disposal Alternative	Summary	VC Interactions and Potential Effects
		• Marine vessel movements for transport of dredged sediments from the TMJ area to the Point Grey Disposal Site could temporarily affect navigation, area access and area use by commercial and non-commercial marine vessels. • Change in distribution and abundance of marine mammals and coastal birds may affect marine tourism. • Changes in distribution and abundance of harvestable fish and seafood species could affect commercial and recreational fish harvesting and guided sport fishing. **Current Use of Lands and Resources for Traditional Purposes** • Marine vessel movements for transport of dredged sediments from the TMJ area to the Point Grey Disposal Site could temporarily affect navigation of Indigenous fisheries vessels and some preferred locations for fishing. • Effects on air quality, atmospheric noise and visual quality during transport of dredge material for disposal could temporarily affect quality of use experience. • Effects to fish species could affect Indigenous Groups harvesting fish for FSC or domestic purposes.

APPENDIX 4 – LIST OF WORKING GROUP MEMBERS

PROVINCIAL GOVERNMENT

BC Oil and Gas Commission
Fraser Health Authority
Ministry of Energy, Mines and Petroleum Resources
Ministry of Environment and Climate Change Strategy
Ministry of Forests, Lands, Natural Resource Operations and Rural Development
Ministry of Indigenous Relations and Reconciliation
Ministry of Municipal Affairs and Housing

FEDERAL GOVERNMENT

Environment and Climate Change Canada
Fisheries and Oceans Canada
Fisheries and Oceans Canada - Coast Guard
Fisheries and Oceans Canada, Pacific Region
Health Canada
Natural Resources Canada
Port of Vancouver
Transport Canada

LOCAL GOVERNMENT

City of Richmond
City of Delta
Metro Vancouver

INDIGENOUS GROUPS

Cowichan Tribes
Ditidaht First Nation
Esquimalt Nation
Halalt First Nation
Kwantlen First Nation
Lyackson First Nation
Maa-nulth First Nations (Treaty):

- Huu-ay-aht First Nations
- Ka:'yu:'k't'h'/Che:k'tles7et'h' First Nations
- Toquaht Nation
- Uchucklesaht Tribe

- Ucluelet First Nation (Yuułuʔiłʔatḥ First Nation)

Malahat Nation
Musqueam Indian Band
Pacheedaht First Nation
Pauquachin First Nation;
Penelakut Tribes
Scia'new (Beecher Bay) First Nation
Semiahmoo First Nation
Snuneymuxw First Nation
Songhees Nation
Squamish Nation
Stz'uminus First Nation
T'Sou-ke (Sooke) First Nation
Ts'uubaa-asatx Nation (formerly Lake Cowichan First Nation)
Tsartlip First Nation
Tsawout First Nation
Tsawwassen First Nation (Treaty)
Tseycum Indian Band
Tsleil-Waututh Nation

APPENDIX 5 – RESIDUAL EFFECTS CHARACTERIZATION DEFINITIONS

Table 35: Residual Effects Characterization Definitions for the Original Application Area (Jetty to Sand Heads)

RESIDUAL EFFECTS CHARACTERIZATION DEFINITIONS FOR THE ORIGINAL APPLICATION AREA (JETTY TO SAND HEADS)					
Characterization	**General Description**	**Assessment Report Chapters**			
		River Processes	**Fish and Fish Habitat**	**Marine Mammals**	**Air Quality**
Context	The current and future sensitivity and resilience of the VC to change caused by the project. Context draws on the descriptions of the existing conditions for the VC, which reflect cumulative effects of other projects and activities that have been carried out, and especially information about the effects of natural and human-caused trends in the condition of the VC.	**Low –** The indicator has low resiliency or is acutely sensitive to existing conditions **Moderate –** The indicator has moderate resiliency or is mildly sensitive to existing conditions **High –** The indicator has high resiliency or is generally not sensitive to existing conditions			
Magnitude	The expected size or severity of the residual effect. Considers the proportion of the VC affected within the spatial boundaries and the relative effect (e.g., relative to natural annual variation in the magnitude of the VC or other relevant characteristics).	**Negligible**—effects which are so small that they are neither detectable nor measurable and are not anticipated to influence the short- or long-term viability of the PC or a subcomponent. **Low—**effect cannot be distinguished from baseline case conditions; magnitude of effect is less than the typical variation of the baseline conditions. **Moderate**—effect would result in demonstrable change but remains within historical norms; magnitude of effect is of the same order of the typical variation of the baseline conditions. **High**—effect results in changes that are beyond	**Negligible:** Project would likely have no measurable effect on fish populations or the function of fish habitat **Low:** Residual effect would result in small measurable changes in abundance of fish, or result in the loss of low quality, non-essential fish habitat **Moderate:** Residual effect would likely result in fish mortality with measurable changes in abundance of fish populations, or permanent loss of moderate or high-quality fish habitat**.** **High:** Residual effect would likely result in large effects on fish abundance occurring at a population level, or measurable effects, including mortality, on provincially listed or SARA-listed fish species, or loss of limiting or critical habitat for	**Negligible**—effects which are so small that they are neither detectable nor measurable and are not anticipated to influence the short- or long-term viability of marine mammal populations. **Low**—Project is likely to result in changes in habitat quality that can be monitored and measured above background conditions, but are within the scope of the natural variability, do not exceed established criteria or scientific threshold levels, and do not meet any of the "moderate" or "high" magnitude definitions. **Moderate**—Project is likely to result in one or more of the following: ▪ Localized alteration of habitat including exceedances of underwater noise behavioural or injury thresholds, water or sediment quality standards, guidelines or baseline conditions – less than 10 times ▪ ≥1 death or injury of a subcomponent ▪ Occasional or temporary disruption of critical activities (e.g., breeding, nursing) and/or localized damage to sensitive or critical habitats **High**—Project is likely to result in one or more of the following: ▪ Widespread degradation of habitat in excess of	**Negligible:** ▪ The predicted change in maximum concentration is less than or equal to 1% of the Ambient Air Quality Objective. **Low:** ▪ The predicted change in the maximum concentration is between >1% and 10% of the Ambient Air Quality Objective and the Application Case maximum concentration is still below the Ambient Air Quality Objective; or ▪ The predicted change in the maximum concentration is between >1% and 10% of the Ambient Air Quality Objective and the Baseline Case maximum concentration already exceeds the Ambient Air Quality Objective. **Moderate:** ▪ The predicted change in the maximum concentration is larger than 10% of the Ambient Air Quality Objective and the Application Case maximum concentration is still below the Ambient Air Quality Objective; or ▪ The predicted change in the maximum concentration is between >10% and 50% of the Ambient Air Quality Objective and the Baseline Case maximum concentration already exceeds the ambient air quality objective. **High:** ▪ The predicted change in the maximum concentration is larger than 1% of the Ambient Air Quality Objective and the Application Case maximum concentration exceeds the Ambient Air Quality Objective while the Baseline Case maximum concentration does not; or ▪ The predicted change in the maximum concentration is larger than 50% of the

RESIDUAL EFFECTS CHARACTERIZATION DEFINITIONS FOR THE ORIGINAL APPLICATION AREA (JETTY TO SAND HEADS)					
Characterization	**General Description**	**Assessment Report Chapters**			
		River Processes	**Fish and Fish Habitat**	**Marine Mammals**	**Air Quality**
		historical norms; magnitude of effect is greater than the typical variation of the baseline conditions.	provincially-listed or SARA-listed fish species	underwater noise behavioural or injury thresholds, water or sediment quality standards, guidelines or baseline conditions – more than 10 times ▪ ≥1 death or injury of a SARA, blue- or red-listed subcomponent ▪ Extensive disruption of critical activities (e.g., foraging, breeding or nursing grounds) or damage to sensitive or critical habitats	Ambient Air Quality Objective and the maximum concentration in both the Baseline Case already exceeds the Ambient Air Quality Objective.
Extent	The spatial scale over which the residual effect is expected to occur.	**Site-specific** – Residual effect is restricted to the Project area or a specific area of the LAA **Local** – Residual effect is restricted to the LAA **Regional** – Residual effect is restricted to the RAA **Beyond Regional –** Residual effect extends beyond the RAA			
Duration	The length of time the residual effect persists (which may be longer than the duration of the physical work or activity that gave rise to the residual effect).	**Short-term –** Residual effect is present for less than one year. **Medium-term** - Residual effect present during construction or decommissioning phases **Long-term –** Residual effect present for the life of the Project **Permanent –** Residual effect is present indefinitely			
Frequency	How often the residual effect occurs and is usually closely related to the frequency of the physical work or activity causing the residual effect.	**Infrequent** – Residual effect occurs once or rarely over the specified duration **Frequent/ Regular** – Residual effect occurs frequently, at regular intervals **Continuous** – Residual effect occurs continuously			
Reversibility	Whether or not the residual effect on the VC can be reversed once the physical work or the activity causing the disturbance ceases.	**Reversible –** Residual effect is reversible **Partially reversible –** Residual effect can be reversed partially **Irreversible** – Residual effect is permanent			

RESIDUAL EFFECTS CHARACTERIZATION DEFINITIONS FOR THE ORIGINAL APPLICATION AREA (that is, JETTY TO SAND HEADS)					
Characterization	**General Description**	**Assessment Report Chapters**			
		GHG Management	**Noise**	**Water Quality**	**Vegetation***
Context	The current and future sensitivity and resilience of the VC to change caused by the project. Context draws on the descriptions of the existing conditions for the VC, which reflect cumulative effects of other projects and activities that have been carried out, and especially information about the effects of natural and human-caused trends in the condition of the VC.	**Low –** The indicator has low resiliency or is acutely sensitive to existing conditions **Moderate –** The indicator has moderate resiliency or is mildly sensitive to existing conditions **High –** The indicator has high resiliency or is generally not sensitive to existing conditions			
Magnitude	The expected size or severity of the residual effect. Considers the proportion of the VC affected within the spatial boundaries and the relative effect (e.g., relative to natural annual variation in the magnitude of the VC or other relevant characteristics).	**Low**— No measurable change in provincial, national and global GHG emissions **Moderate**— Although, measurable, based on CEAA guidance (2003), professional judgement, and the industry profile, relatively small changes would be expected in provincial, national, and global GHG emissions. **High**— Based on CEAA guidance (2003), professional judgement, and the industry profile, a relatively high change would be expected in provincial emissions and a notable change in national emissions while change to global emissions would be small.	**Negligible**—effects which are so small that they are neither detectable nor measurable and are not anticipated to influence the short- or long-term viability of Noise • Application noise levels are ≤3 dB change from baseline noise levels • Change in %HA of ≤6.5% • For speech comprehension, daytime application noise levels ≤55 dBA or exceed daytime baseline noise levels by ≤3 dB; and • For sleep disturbance, nighttime application noise levels are ≤45 dBA or exceed nighttime baseline noise levels by ≤3 dB. **Low:** • Application noise levels ≤PSL • Change in %HA of ≤6.5% • For speech comprehension, daytime application noise levels exceed 55 dBA by ≤3 dB or exceed daytime baseline noise levels by ≤5 dB; or • For sleep disturbance, nighttime application noise levels exceed 45 dBA by ≤ 3 dB or exceed nighttime baseline noise levels by ≤5 dB. **Moderate:** • Application noise levels exceed the PSL by ≤5 dB • Change in %HA of ≤10% • For speech comprehension, daytime application noise levels exceed 55 dBA by ≤5 dB or exceed daytime baseline noise levels by ≤10 dB; or • For sleep disturbance, nighttime application noise levels exceed 45 dBA by ≤5 dB or exceed nighttime baseline noise levels by ≤10 dB. **High:** • Application noise levels exceed the PSL by >5 dB • Change in %HA of >10% • For speech comprehension, daytime application noise levels exceed 55 dBA by >5 dB or exceed daytime baseline noise levels by >10 dB; or	**Negligible**—a change in water quality due to the Project that is so small it is neither detectable nor measurable and is not anticipated to influence the short- or long-term viability of water quality, sediment quality, or aquatic health. **Low**—a detectable change in water quality due to the Project that is within variability documented for the assessment area. The change cannot be distinguished from existing conditions accounting for inherent variability due to tidal cycles and river discharge. Peak concentrations may extend above FRWQOs or applicable water quality guidelines. **Moderate**—a detectable change in water quality due to the Project that is outside of the variability documented for the assessment area. Peak concentrations are expected to extend above FRWQOs or applicable water quality guidelines and suggest the potential for effects on the most sensitive indicators that reside in the receiving environment. **High**—a detectable change in water quality due to the Project that is outside of the variability documented for the assessment area. Peak concentrations are expected to	**Negligible**—effects which are so small that they are neither detectable nor measurable and are not anticipated to influence the short- or long-term viability of the VC subcomponent. **Low**—measurable change to the VC subcomponent, reproductive capacity, survival, or extent of suitable habitat; regional population or extent sufficient to sustain the subcomponent without active management. **Moderate**—measurable change to reproductive capacity, survival or extent of suitable habitat for the VC subcomponent over the short or medium term; regional recovery to pre-project conditions expected with management. **High**—measurable change to reproductive capacity, survival, or extent of suitable habitat for the VC subcomponent resulting in a net loss of wetland

RESIDUAL EFFECTS CHARACTERIZATION DEFINITIONS FOR THE ORIGINAL APPLICATION AREA (that is, JETTY TO SAND HEADS)					
Characterization	**General Description**	**Assessment Report Chapters**			
		GHG Management	**Noise**	**Water Quality**	**Vegetation***
			• For sleep disturbance, nighttime application noise levels exceed 45 dBA by >5 dB or exceed nighttime baseline noise levels by >10 dB.	extend above FRWQOs and applicable guidelines and suggest potential for effects on a wider range of indicators in the receiving environment.	functions or a greater than 10% loss of ecosystems or plant species of management concern in the RAA.
Extent	The spatial scale over which the residual effect is expected to occur.	**Site-specific** – Residual effect is restricted to the Project area or a specific area of the LAA **Local** – Residual effect is restricted to the LAA **Regional** – Residual effect is restricted to the RAA **Beyond Regional –** Residual effect extends beyond the RAA			
Duration	The length of time the residual effect persists (which may be longer than the duration of the physical work or activity that gave rise to the residual effect).	**Short-term –** Residual effect is present for less than one year. **Medium-term** - Residual effect present during construction or decommissioning phases **Long-term –** Residual effect present for the life of the Project **Permanent –** Residual effect is present indefinitely			
Frequency	How often the residual effect occurs and is usually closely related to the frequency of the physical work or activity causing the residual effect.	**Infrequent** – Residual effect occurs once or rarely over the specified duration **Frequent/ Regular** – Residual effect occurs frequently, at regular intervals **Continuous** – Residual effect occurs continuously			
Reversibility	Whether or not the residual effect on the VC can be reversed once the physical work or the activity causing the disturbance ceases.	**Reversible –** Residual effect is reversible **Partially reversible –** Residual effect can be reversed partially **Irreversible** – Residual effect is permanent			

RESIDUAL EFFECTS CHARACTERIZATION DEFINITIONS FOR THE ORIGINAL APPLICATION AREA (that is, JETTY TO SAND HEADS)				
Characterization	**General Description**	**Assessment Report Chapters**		
		Wildlife and Wildlife Habitat and Marine Birds**	**Land and Marine Resource Use**	**Current Use of Lands and Resources for Traditional Purposes**
Context	The current and future sensitivity and resilience of the VC to change caused by the project. Context draws on the descriptions of the existing conditions for the VC, which reflect cumulative effects of other projects and activities that have been carried out, and especially information about the effects of natural and human-caused trends in the condition of the VC.	**Low –** The indicator has low resiliency or is acutely sensitive to existing conditions **Moderate –** The indicator has moderate resiliency or is mildly sensitive to existing conditions **High –** The indicator has high resiliency or is generally not sensitive to existing conditions		

RESIDUAL EFFECTS CHARACTERIZATION DEFINITIONS FOR THE ORIGINAL APPLICATION AREA (that is, JETTY TO SAND HEADS)				
Characterization	**General Description**	**Assessment Report Chapters**		
		Wildlife and Wildlife Habitat and Marine Birds**	**Land and Marine Resource Use**	**Current Use of Lands and Resources for Traditional Purposes**
Magnitude	The expected size or severity of the residual effect. Considers the proportion of the VC affected within the spatial boundaries and the relative effect (e.g., relative to natural annual variation in the magnitude of the VC or other relevant characteristics).	**Negligible**—effects that are so small that they are neither detectable nor measurable and are not anticipated to influence the short- or long-term viability of a subcomponent or focal species. **Low**—the incremental change in the indicator will result in no measurable effect on the subcomponent or result in a minor measurable effect on the subcomponent or focal species. **Moderate**—the incremental change in the indicator will result in a clearly defined change to the subcomponent or focal species but remains below a level of effect that could exceed the resilience and adaptability limits of the population. **High**—the incremental change in the indicator is sufficiently large that it approaches or falls within the range of effects that could exceed the resilience and adaptability of the subcomponent or focal species.	**Negligible**—a change that is small such that it is not detectable nor measurable and would not noticeably affect the VC or a Subcomponent. **Low**—a small but detectable change from baseline conditions that is within historic norms and within the system's capacity to respond. **Moderate**—a demonstrable change from baseline conditions that is within historic norms and within the system's capacity to respond. **High**—a demonstrable change from baseline conditions that is beyond historic norms and beyond the system's capacity for effective response	**Negligible**—a change that is small such that it is not detectable nor measurable and would not noticeably affect the VC or a Subcomponent. **Low**—a small but detectable change from baseline conditions that is within historic norms and within the system's capacity to respond. **Moderate**—a demonstrable change from baseline conditions that is within historic norms and within the system's capacity to respond. **High**—a demonstrable change from baseline conditions that is beyond historic norms and beyond the system's capacity for effective response.
Extent	The spatial scale over which the residual effect is expected to occur.	**Site-specific** – Residual effect is restricted to the Project area or a specific area of the LAA **Local** – Residual effect is restricted to the LAA **Regional** – Residual effect is restricted to the RAA **Beyond Regional –** Residual effect extends beyond the RAA	**Site-specific** – Residual effect is restricted to the Project area or a specific area of the LAA **Local** – Residual effect is restricted to the LAA **Regional** – Residual effect is restricted to the RAA	
Duration	The length of time the residual effect persists (which may be longer than the duration of the physical work or activity that gave rise to the residual effect).	**Short-term –** Residual effect is present for less than one year. **Medium-term -** Residual effect present during construction or decommissioning phases **Long-term –** Residual effect present for the life of the Project **Permanent –** Residual effect is present indefinitely		
Frequency	How often the residual effect occurs and is usually closely related to the frequency of the physical work or activity causing the residual effect.	**Infrequent** – Residual effect occurs once or rarely over the specified duration **Frequent/ Regular** – Residual effect occurs frequently, at regular intervals **Continuous** – Residual effect occurs continuously		
Reversibility	Whether or not the residual effect on the VC can be reversed once the physical work or the activity causing the disturbance ceases.	**Reversible –** Residual effect is reversible **Partially reversible –** Residual effect can be reversed partially **Irreversible** – Residual effect is permanent		

RESIDUAL EFFECTS CHARACTERIZATION DEFINITIONS FOR THE ORIGINAL APPLICATION AREA (JETTY TO SAND HEADS)			
Characterization	**General Description**	**Assessment Report Chapters**	
		Visual Quality Effects	**Human Health**
Context	The current and future sensitivity and resilience of the VC to change caused by the project. Context draws on the descriptions of the existing conditions for the VC, which reflect cumulative effects of other projects and activities that have been carried out, and especially information about the impact of natural and human-caused trends in the condition of the VC.	**Low –** The indicator has low resiliency or is acutely sensitive to existing conditions **Moderate –** The indicator has moderate resiliency or is mildly sensitive to existing conditions **High –** The indicator has high resiliency or is generally not sensitive to existing conditions	
Magnitude	The expected size or severity of the residual effect. Considers the proportion of the VC affected within the spatial boundaries and the relative effect (e.g., relative to natural annual variation in the magnitude of the VC or other relevant characteristics).	**Negligible**—change in existing visual quality not perceptible from existing conditions within the LAA. **Low**—there is a small change to existing visual quality that is not uncharacteristic with the existing visual character within the LAA. **Moderate**—there is a noticeable and distinct change to existing visual quality that may not be considered uncharacteristic with the existing visual character within the LAA. **High**—there is evident and extensive change to existing visual quality that is uncharacteristic with the existing visual character within the LAA.	These are identified based on calculated hazard quotients (HQ) and incremental lifetime cancer risks (ILCR). **Negligible** – Health risk is not affected or slightly affected but exposure ratios for Project-related exposures are below the benchmarks established by a recognized health organization. (i.e. HQ<1.0or ILCR<10^{-5}) **Low** - Project-related environmental exposures marginally exceed the benchmarks established by a recognized health organization. (i.e. 1.0<HQ≤2. or 1x10-$^{5<}$ILCR≤10^{-4}) **Moderate** – Project-related environmental exposures are predicted to exceed the benchmarks by a recognized health organization. (i.e. 2.0<HQ≤10.0 r 1x10^{-4}<ILCR≤10^{-3}) **High** – Project-related environmental exposures are predicted to substantially exceed the benchmarks established by a recognized health organization. (i.e. HQ>10.0 or ILCR10^{-3}) Hazard Quotient for the Human Health Effects Assessment represents the ratio of the predicted air concentrations relative to its health-based air threshold. For inhalation risk assessments, concentrations in air are compared to thresholds specific to the inhalation pathway for the purpose of calculating a hazard quotient, and no apportionment is required to account for intake from other media.
Extent	The spatial scale over which the residual effect is expected to occur.	**Site-specific** – Residual effect is restricted to the Project area or a specific area of the LAA **Local** – Residual effect is restricted to the LAA **Regional** – Residual effect is restricted to the RAA	Receptor locations were identified within the LAA and RAA. Therefore, the geographic locations were set, and risk estimates were calculated for each of these locations. As a result, geographic extent was fixed in the HHRA and is not used to determine significance of residual effect for the Human Health assessment.
Duration	The length of time the residual effect persists (which may be longer than the duration of the physical work or activity that gave rise to the residual effect).	**Short-term –** Residual effect is present for less than one year. **Medium-term -** Residual effect present during construction or decommissioning phases **Long-term –** Residual effect present for the life of the Project **Permanent –** Residual effect is present indefinitely	Exposure duration is not an independent variable in the HHRA because it was necessary to assume an exposure duration to calculate a daily exposure dose resulting from chronic exposure to a COPC. As a result, duration is not used to determine residual effects or their duration for the Human Health assessment.

RESIDUAL EFFECTS CHARACTERIZATION DEFINITIONS FOR THE ORIGINAL APPLICATION AREA (JETTY TO SAND HEADS)			
Characterization	**General Description**	**Assessment Report Chapters**	
		Visual Quality Effects	**Human Health**
Frequency*	How often the residual effect occurs and is usually closely related to the frequency of the physical work or activity causing the residual effect.	**Infrequent** – Residual effect occurs once or rarely over the specified duration **Frequent/ Regular** – Residual effect occurs frequently, at regular intervals **Continuous** – Residual effect occurs continuously	For the HHRA, the frequency of exposure is not an independent variable because it was necessary to assume a particular exposure frequency to calculate an estimate of a daily exposure dose in accordance with risk assessment guidance that would result from chronic exposure to a COPC. As a result, frequency is not used to determine residual effect or significance for the Human Health assessment. Probability was used to quantitatively evaluate the likelihood of a residual effect occurring. * Frequency includes Probability for the Human Health VC.
Reversibility	Whether or not the residual effect on the VC can be reversed once the physical work or the activity causing the disturbance ceases.	**Reversible –** Residual effect is reversible **Partially reversible –** Residual effect can be reversed partially **Irreversible** – Residual effect is permanent	

Table 36: Residual Effects Characterization Definitions for the Marine Shipping Assessment

RESIDUAL EFFECTS CHARACTERIZATION DEFINITIONS FOR THE MARINE SHIPPING ASSESSMENT			
Characterization	**General Description**	**Assessment Report Chapters**	
		Fish and Fish Habitat	**Marine Mammals**
Context	The current and future sensitivity and resilience of the VC to change caused by the project. Context draws on the descriptions of the existing conditions for the VC, which reflect cumulative effects of other projects and activities that have been carried out, and especially information about the effects of natural and human-caused trends in the condition of the VC.	**Low –** The indicator has low resiliency or is acutely sensitive to existing conditions **Moderate –** The indicator has moderate resiliency or is mildly sensitive to existing conditions **High –** The indicator has high resiliency or is generally not sensitive to existing conditions	
Magnitude	The expected size or severity of the residual effect. Considers the proportion of the VC affected within the spatial boundaries and the relative effect (e.g., relative to natural annual variation in the magnitude of the VC or other relevant characteristics).	**Negligible:** Project would likely have no measurable effect on fish populations or the function of fish habitat **Low:** Residual effect would result in small measurable changes in abundance of fish, or result in the loss of low quality, non-essential fish habitat **Moderate:** Residual effect would likely result in fish mortality with measurable changes in abundance of fish populations, or permanent loss of moderate or high-quality fish habitat. **High:** Residual effect would likely result in large effects on fish abundance occurring at a population level, or measurable effects, including mortality, on provincially listed or SARA-listed fish species, or loss of limiting or critical habitat for provincially-listed or SARA-listed fish species	**Negligible** – effects which are so small that they are neither detectable nor measurable and are not anticipated to influence the short- or long-term viability of the VC or a Subcomponent. **Low**—Project is likely to result in changes in habitat quality that can be monitored and measured above background conditions, but are within the scope of the natural variability, do not exceed established criteria or scientific threshold levels, and do not meet any of the “moderate” or “high” magnitude definitions. **Moderate**—Project is likely to result in one or more of the following: • Localized alteration of habitat including exceedances of underwater sound behavioural thresholds. • ≥1 death or injury of a subcomponent not listed as Threatened or Endangered under SARA • Occasional or temporary disruption of critical activities (e.g., foraging, breeding, nursing) and/ or localized damage to sensitive or critical habitats. **High**—Project is likely to result in one or more of the following: • Widespread degradation of habitat in excess of underwater sound behavioural thresholds • ≥1 death or injury of a subcomponent listed as Threatened or Endangered under SARA

RESIDUAL EFFECTS CHARACTERIZATION DEFINITIONS FOR THE MARINE SHIPPING ASSESSMENT			
Characterization	**General Description**	**Assessment Report Chapters**	
		Fish and Fish Habitat	**Marine Mammals**
			• Extensive disruption of critical activities (e.g., foraging, breeding or nursing grounds) or damage to sensitive or critical habitats.
Extent	The spatial scale over which the residual effect is expected to occur.	**Site Specific** – Residual effect is within the immediate vicinity of transiting vessels **Fish MSA Area** – Residual effect is limited to the Fish MSA Area **Beyond the Fish MSA Area –** Residual effect extends beyond the Fish SMA Area	**Site Specific –**Residual effects limited to the Inbound/ outbound shipping lanes **Marine Mammal MSA Area –** Residual effects limited to the MSA LAA/ RAA **Beyond Marine Mammal MSA Area** - Residual effects extend to areas beyond the MSA LAA/ RAA
Duration	The length of time the residual effect persists (which may be longer than the duration of the physical work or activity that gave rise to the residual effect).	**Short-term –** Residual effect is present for less than one year. **Medium-term** - Residual effect present during construction or decommissioning phases **Long-term –** Residual effect present for the life of the Project **Permanent –** Residual effect is present indefinitely	
Frequency	How often the residual effect occurs and is usually closely related to the frequency of the physical work or activity causing the residual effect.	**Infrequent** – Residual effect occurs once or rarely over the specified duration **Frequent/ Regular** – Residual effect occurs repeatedly over the specified duration **Continuous** – Residual effect occurs continuously	
Reversibility	Whether or not the residual effect on the VC can be reversed once the physical work or the activity causing the disturbance ceases.	**Reversible –** Residual effect is reversible **Partially reversible –** Residual effect can be reversed partially **Irreversible** – Residual effect is permanent	

RESIDUAL EFFECTS CHARACTERIZATION DEFINITIONS FOR THE MARINE SHIPPING ASSESSMENT					
Characterization	**General Description**	**Assessment Report Chapters**			
		Air Quality	**GHG Management**	**Wildlife and Wildlife Habitat and Marine Birds**	**Land and Marine Resource Use**
Context	The current and future sensitivity and resilience of the VC to change caused by the project. Context draws on the descriptions of the existing conditions for the VC, which reflect cumulative effects of other projects and activities that have been carried out, and especially information about the effects of natural and human-caused trends in the condition of the VC.	**Low –** The indicator has low resiliency or is acutely sensitive to existing conditions **Moderate –** The indicator has moderate resiliency or is mildly sensitive to existing conditions **High –** The indicator has high resiliency or is generally not sensitive to existing conditions			

RESIDUAL EFFECTS CHARACTERIZATION DEFINITIONS FOR THE MARINE SHIPPING ASSESSMENT					
Characterization	**General Description**	**Assessment Report Chapters**			
		Air Quality	**GHG Management**	**Wildlife and Wildlife Habitat and Marine Birds**	**Land and Marine Resource Use**
Magnitude	The expected size or severity of the residual effect. Considers the proportion of the VC affected within the spatial boundaries and the relative effect (e.g., relative to natural annual variation in the magnitude of the VC or other relevant characteristics).	**Negligible:** ▪ The predicted change in maximum concentration is less than or equal to 1% of the Ambient Air Quality Objective. **Low:** ▪ The predicted change in the maximum concentration is between >1% and 10% of the Ambient Air Quality Objective and the Application Case maximum concentration is still below the Ambient Air Quality Objective; or ▪ The predicted change in the maximum concentration is between >1% and 10% of the Ambient Air Quality Objective and the Baseline Case maximum concentration already exceeds the Ambient Air Quality Objective. **Moderate:** ▪ The predicted change in the maximum concentration is larger than 10% of the Ambient Air Quality Objective and the Application Case maximum concentration is still below the Ambient Air Quality Objective; or ▪ The predicted change in the maximum concentration is between >10% and 50% of the Ambient Air Quality Objective and the Baseline Case maximum concentration already exceeds the Ambient Air Quality Objective. **High:** ▪ The predicted change in the maximum concentration is larger than 10% of the Ambient Air Quality Objective and the Application Case maximum concentration exceeds the Ambient Air Quality Objective while the Baseline Case maximum concentration does not; or ▪ The predicted change in the maximum concentration is larger than 50% of the Ambient Air Quality Objective and the maximum concentration in both the Baseline Case already exceeds the Ambient Air Quality Objective.	**Negligible**—effects which are so small that they are neither detectable nor measurable and are not anticipated to influence the short- or long-term viability of the VC or a subcomponent. **Low**—>0.1% but <1% of the provincial emission levels, or >2% but <16% of national sector emission levels, or >0.01% but <0.1% of the federal emission levels. **Moderate**—>1% of the provincial emission levels, or >16% of national sector emission levels, or >0.1% of the federal emission levels. **High**—>5% of the provincial emission levels, or >75% of national sector emission levels, or >0.5% of the federal emission levels.	**Negligible**—effects that are so small that they are neither detectable nor measurable and are not anticipated to influence the short- or long-term viability of a subcomponent or focal species. **Low**—the incremental change in the indicator will result in no measurable effect on the subcomponent or result in a minor measurable effect on the subcomponent or focal species. **Moderate**—the incremental change in the indicator will result in a clearly defined change to the subcomponent or focal species but remains below a level of effect that could exceed the resilience and adaptability limits of the population. **High**—the incremental change in the indicator is sufficiently large that it approaches or falls within the range of effects that could exceed the resilience and adaptability of the subcomponent or focal species.	**Negligible**—a change that is small, such that it is not detectable nor measurable and would not noticeably affect the VC or a Subcomponent. **Low**—a small but detectable change from baseline conditions that is within historic norms and within the system's capacity to respond. **Moderate**—a demonstrable change from baseline conditions that is within historic norms and within the system's capacity to respond. **High**—a demonstrable change from baseline conditions that is beyond historic norms and beyond the system's capacity for effective response.
Extent	The spatial scale over which the residual effect is expected to occur.	The receptor locations were identified within the LAA and RAA. Therefore, the geographic locations were set, and the predicted receptor concentrations were predicted at each of these locations. As a result, geographic extent was fixed in the air assessment and is not used to	**Site Specific –**Residual effects limited to the Project Site **LAA –** Residual effects limited to the LAA **RAA -** Residual effects limited to the RAA **Beyond the RAA -** Residual effects extend to areas beyond the RAA	**Site Specific –**Residual effects limited to the Inbound/ outbound shipping lanes **Marine Bird MSA Area –** Residual effects limited to the MSA LAA/ RAA **Beyond Marine Bird MSA Area -** Residual effects extend to areas beyond the MSA LAA/ RAA	**Site Specific –**Residual effects limited to a specific location of a transiting vessel **LAA –** Residual effects limited to the LAA **MAA -** Residual effects limited to the MAA

RESIDUAL EFFECTS CHARACTERIZATION DEFINITIONS FOR THE MARINE SHIPPING ASSESSMENT					
Characterization	**General Description**	**Assessment Report Chapters**			
		Air Quality	**GHG Management**	**Wildlife and Wildlife Habitat and Marine Birds**	**Land and Marine Resource Use**
		determine significance of residual effect for the MSA air quality subcomponent.			
Duration	The length of time the residual effect persists (which may be longer than the duration of the physical work or activity that gave rise to the residual effect).	**Short-term –** Residual effect is present for less than one year. **Medium-term** - Residual effect present during construction or decommissioning phases **Long-term –** Residual effect present for the life of the Project **Permanent –** Residual effect is present indefinitely			
Frequency	How often the residual effect occurs and is usually closely related to the frequency of the physical work or activity causing the residual effect.	**Infrequent** – Residual effect occurs once or rarely over the specified duration **Frequent/ Regular** – Residual effect occurs repeatedly over the specified duration **Continuous** – Residual effect occurs continuously			
Reversibility	Whether or not the residual effect on the VC can be reversed once the physical work or the activity causing the disturbance ceases.	**Reversible –** Residual effect is reversible **Partially reversible –** Residual effect can be reversed partially **Irreversible** – Residual effect is permanent			

RESIDUAL EFFECTS CHARACTERIZATION DEFINITIONS FOR THE MARINE SHIPPING ASSESSMENT				
Characterization	**General Description**	**Assessment Report Chapters**		
		Current Use of Lands and Resources for Traditional Purposes	**Visual Quality Effects**	**Human Health**
Context	The current and future sensitivity and resilience of the VC to change caused by the project. Context draws on the descriptions of the existing conditions for the VC, which reflect cumulative effects of other projects and activities that have been carried out, and especially information about the effects of natural and human-caused trends in the condition of the VC.	**Low –** The indicator has low resiliency or is acutely sensitive to existing conditions **Moderate –** The indicator has moderate resiliency or is mildly sensitive to existing conditions **High –** The indicator has high resiliency or is generally not sensitive to existing conditions		
Magnitude	The expected size or severity of the residual effect. Considers the proportion of the VC affected within the spatial boundaries and the relative effect (e.g., relative to natural annual variation in the magnitude of the VC or other relevant characteristics).	**Negligible**—a change that is small, such that it is not detectable nor measurable and would not noticeably affect the VC or a Subcomponent. **Low**—a small but detectable change from baseline conditions that is within historic norms and within the system's capacity to respond. **Moderate**—a demonstrable change from baseline conditions that is within historic norms and within the system's capacity to respond.	**Negligible**—a change in visual quality that is not readily perceptible from existing conditions and is consistent with the existing visual character of the LAA. **Low**—a discernible change to existing visual quality that remains consistent with the existing visual character of the LAA. **Moderate**—a noticeable and distinct change to the existing visual quality that remains consistent with the existing visual character of the LAA.	These are identified based on calculated hazard quotients (HQ) and incremental lifetime cancer risks (ILCR). **Negligible** – Health risk is not affected or slightly affected but exposure ratios for Project-related exposures are below the benchmarks established by a recognized health organization. (i.e., HQ<1.0 or ILCR<$1x10^{-5}$) **Low** – Project-related environmental exposures marginally exceed the benchmarks established by a recognized health organization. (i.e., 1.0<HQ≤2.0 or $1x10^{-5}$<ILCR≤10^{-4})

RESIDUAL EFFECTS CHARACTERIZATION DEFINITIONS FOR THE MARINE SHIPPING ASSESSMENT				
Characterization	**General Description**	**Assessment Report Chapters**		
		Current Use of Lands and Resources for Traditional Purposes	**Visual Quality Effects**	**Human Health**
		High—a demonstrable change from baseline conditions that is beyond historic norms and beyond the system's capacity for effective response.	**High**—evident and extensive change to existing visual quality that is inconsistent with the existing visual character within the LAA.	**Moderate** – Project-related environmental exposures are predicted to exceed the benchmarks by a recognized health organization. (i.e., 2.0<HQ≤10.0 or $1x10^{-4}$<ILCR≤10^{-3}) **High** – Project-related environmental exposures are predicted to substantially exceed the benchmarks established by a recognized health organization. (i.e., HQ>10.0 or ILCR>10^{-3}) Hazard Quotient for the Human Health Effects Assessment represents the ratio of the predicted air concentrations relative to its health-based air threshold. For inhalation risk assessments, concentrations in air are compared to thresholds specific to the inhalation pathway for the purpose of calculating a hazard quotient, and no apportionment is required to account for intake from other media.
Extent	The spatial scale over which the residual effect is expected to occur.	**Site Specific –**Residual effects limited to a specific location of a transiting vessel **LAA –** Residual effects limited to the LAA **MAA -** Residual effects limited to the MAA	**Site Specific –**Residual effects limited to a specific viewing location of a transiting vessel **LAA –** Residual effects limited to the LAA **MAA -** Residual effects extend to the RAA	Receptor locations were identified within the LAA and RAA. Therefore, the geographic locations were set, and risk estimates were calculated for each of these locations. As a result, geographic extent was fixed in the HHRA and is not used to determine significance of residual effect for the Human Health assessment.
Duration	The length of time the residual effect persists (which may be longer than the duration of the physical work or activity that gave rise to the residual effect).	**Short-term –** Residual effect is present for less than one year. **Medium-term** - Residual effect present during construction or decommissioning phases **Long-term –** Residual effect present for the life of the Project **Permanent –** Residual effect is present indefinitely		Exposure duration is not an independent variable in the HHRA because it was necessary to assume an exposure duration to calculate an exposure to a COPC. The HHRA focused on acute short-term exposure durations of 1-hour and 24-hours. As a result, duration is not used to determine residual effects or their duration for the Human Health assessment.
Frequency	How often the residual effect occurs and is usually closely related to the frequency of the physical work or activity causing the residual effect.	**Infrequent** – Residual effect occurs once or rarely over the specified duration **Frequent/ Regular** – Residual effect occurs repeatedly over the specified duration **Continuous** – Residual effect occurs continuously		For Human Health, the frequency of exposure is not an independent variable because the predicted air concentrations were based on the worst-case concentration and frequency of exceedances could not be estimated. As a result, frequency is not used to determine residual effect or significance for the Human Health assessment.
Reversibility	Whether or not the residual effect on the VC can be reversed once the physical work or the activity causing the disturbance ceases.	**Reversible –** Residual effect is reversible **Partially reversible –** Residual effect can be reversed partially **Irreversible** – Residual effect is permanent		The HHRA did not include an assessment of reversibility of potential health effects, which cannot be determined for people.

APPENDIX 6 – RATIONALE FOR SPECIES AT RISK CONSIDERED IN THE ASSESSMENT

Table 37: Federally-listed Wildlife with Potential to occur in the TMJ Area (original Application area)[382]

Species	Conservation Status		Subcomponent	Focal Species	Rationale for substitution or not selecting as focal species
	B.C.: Conservation Data Centre Ranking[383]	Federal: COSEWIC or SARA Ranking[384]			
Birds					
Band-tailed pigeon	Blue	Special Concern	-	-	No suitable habitat in the LAA; therefore band-tailed pigeons are not expected to nest in the LAA.
Bank swallow	Yellow	Threatened	-	-	Suitable nesting habitat not been recorded in LAA.
Barn owl (western population)	Red	Threatened	Barn owl		n/a
Barn swallow	Blue	Threatened	Little brown myotis (effects to foraging habitat only)		Barn swallows were not recorded during 2015 field studies in the LAA. Barn swallow may forage over aquatic areas in the LAA. Potential effects to foraging habitat for insectivorous species is discussed in the little brown myotis assessment.
Black swift	Blue	Endangered	Little brown myotis (effects to foraging habitat only)		No suitable nesting habitat occurs in LAA, and black swifts are not expected to nest in the LAA. Black swifts may occasionally forage on insects above the LAA. Potential effects to foraging habitat for insectivorous species is discussed the little brown myotis assessment.
Common nighthawk	Yellow	Threatened	Little brown myotis (effects to foraging habitat only)		Common nighthawk was not recorded during 2015 field studies in the LAA. Common nighthawk may forage on insects about the LAA. Potential effects to foraging habitat for insectivorous species is discussed in the little brown myotis assessment.
Great blue heron (*fannini* subspecies)	Blue	Special Concern	Waterbirds	Great blue heron (*fannini* Subspecies)	n/a
Horned grebe	Yellow	Special Concern	Waterbirds	Double-crested cormorant	Horned grebes may occur in LAA outside of the breeding season in aquatic habitat.
Olive-sided flycatcher	Blue	Threatened	-	-	The LAA does not contain suitable habitat for olive-sided flycatcher breeding. Olive-sided flycatchers are not expected to nest in the LAA.
Red knot	Red	Endangered	Waterbirds	Great blue heron (*fannini* Subspecies)	Although unlikely to occur in the LAA, stopover habitat potentially used by red knots during migration can be represented by foraging habitat for great blue herons.
Western grebe	Red	Special Concern	Waterbirds	Double-crested cormorant	Western grebes forage by diving in shallow water. Double-crested cormorant is considered suitable to addressed potential effects to western grebe foraging habitat.
Evening Grosbeak	Yellow	Special Concern	-	-	The LAA does not provide suitable nesting habitat.
Short-eared owl	Blue	Special Concern	-	-	The LAA does not provide suitable habitat.
Western screech owl	Blue	Threatened	-	-	The LAA does not provide suitable breeding habitat; therefore, are not expected to nest in the LAA.

[382] SARA-listed or COSEWIC-listed species provided to the EAO by Canadian Wildlife Service, which have been identified as being present, or potentially occurring with the TMJ Project Area.

[383] BC Conservation data centre list definitions: **Yellow** = Any species or ecosystem that is at the least risk of being lost; **Blue** = Any species or ecosystem that is of special concern; **Red** = Any species or ecosystem that is at risk of being lost (extirpated, endangered or threatened);

[384] COSEWIC ranking included if no SARA ranking. SARA definitions: **Special concern** = a wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats; **Threatened** = a wildlife species that is likely to become an endangered species if nothing is done to reverse the factors leading to its extirpation or extinction; **Endangered** = a wildlife species that is facing imminent extirpation or extinction.

Species	Conservation Status		Subcomponent	Focal Species	Rationale for substitution or not selecting as focal species
	B.C.: Conservation Data Centre Ranking[383]	Federal: COSEWIC or SARA Ranking[384]			
Other Terrestrial Vertebrates					
Western painted turtle (Pacific coast populations	Red	Endangered	-	-	The LAA does not contain suitable habitat, and western painted turtles have not been reported near the LAA.
Little brown myotis	Yellow	Endangered	Little brown myotis		n/a
Northern red-legged frog	Blue	Special Concern	Amphibians	Pacific chorus frog	Pacific chorus frog breed in a variety of habitats and forage on a variety of crawling and flying insects and are considered a suitable surrogate species
Pacific water shrew	Red	Endangered	-	-	Riparian habitat along the Fraser River is not considered suitable, and the upland area is predominantly concrete and not considered suitable habitat.
Invertebrates					
Dun skipper	Red	Threatened	-	-	Suitable habitat for dun skipper in the LAA is not expected, although the transition area between the marsh and riparian zones in the LAA, as well as along unmanaged ditches and Tilbury Slough outside of the LAA could support host plants. Dun skipped has not been observed within the LAA; however, it was recorded in Burns Bog in 2004. Potential effects to dun skipper resulting from changes in available sedges and grasses is considered in the assessment of potential effects to great-blue heron and wetland extent.

APPENDIX 7 – ENVIRONMENTAL EFFECTS OF POTENTIAL ACCIDENTS AND MALFUNCTIONS

Table 38: Environmental Effects of Potential Accidents and Malfunctions

Accident and Malfunction	Valued Component	Environmental Effects
Hazardous Material Spills	Air Quality	Effects are expected to be negligible and not result in any material increase in TMJ emissions since Volatile Organic Compound (VOC) components from spilled materials would volatilize.
	Vegetation	Effects would be localized and reversible for spills in the vicinity of vegetation for both onshore and offshore spill scenarios.
	Wildlife & Wildlife Habitat	Effects would be localized and reversible for both onshore and offshore scenarios in the immediate vicinity of wildlife.
	Marine Mammals	Effects would be localized as the spill is expected to be boomed and quickly contained to the immediate area around TMJ, refer to Chapter 5.8 – Marine Mammals for further information.
	Water Quality, Fish and Fish Habitat	Onshore spills are expected to have negligible effects. A spill migrating to the estuarine environment would affect water quality; however, as large-scale spills are not expected to occur, effects would be localized and reversible. Fish mortality may occur in immediate vicinity of facility but would not have population effect.
Loss of LNG Containment	Air Quality	Vapour cloud (methane) would be immaterial in terms of context of Air Quality, with rapid dispersion.
	Vegetation and Wildlife & Wildlife Habitat	Potentially affected in immediate vicinity of the spill; however, population-level effects are not expected.
	Marine Mammals	Potential injury or asphyxiation in immediate vicinity at surface of water; spills are expected to be contained to the immediate area of the spill.
	Fish and Fish Habitat	Potentially affected near surface in immediate vicinity of spill; however, population-level effects are not expected as LNG would rapidly dissipate and is not a persistent pollutant.
	Human Health	Limited to TJLP personnel in immediate vicinity of the spill who are trained and equipped with personal protective equipment.
Fire or Explosion	Air Quality and Visual Quality	Effects would occur from combustion emissions and are expected to be localized and short term (<1 hour).
	Vegetation and Wildlife and Wildlife Habitat	Depending on location of fire, brush fire could occur affecting riparian vegetation and wildlife in the vicinity; however, population-level effects are not expected, and vegetation would be rehabilitated.
	Marine Mammals	Potential injury or asphyxiation in immediate vicinity at surface of water as a fire would be expected to be contained to the immediate area.
	Fish and Fish Habitat	Potentially affected in vicinity of fire; however, localized effects without population-level effects are expected.
	Economy and Land and Marine Resource Use	Variable effect to TMJ operations; non-TMJ-related economic activities would be limited.
	Socio-community	Potential strain on local emergency services in the event of a fire of explosion; however, limited and short-lived.
	Human Health[385]	Effects due to emissions would be negligible as combustion emission would quickly disperse.
Unplanned Disturbance of Ecologically Sensitive Areas	Water Quality	Potential increase in sedimentation and would be localized and short-term.
	Vegetation	Potential for accidental removal, if so, area will be revegetated.

[385] This table summarizes the environmental effects of potential accidents and malfunctions. The Human Health effect captured in this table is related to chemical pathways to Human Health.

Accident and Malfunction	Valued Component	Environmental Effects
by Equipment Operations	Fish & Fish Habitat and Wildlife & Wildlife Habitat	Potential habitat loss which could be reversible. Potential injury/ death for fish and wildlife; however, effects without population-level effects are expected.
Failure of Sediment Containment	Water Quality	Potential increase in sedimentation in riparian area and estuarine environment; however, low magnitude and would only occur along a small stretch of riparian area.
	Vegetation, Fish & Fish Habitat, Wildlife & Wildlife Habitat	Effects would be limited to the affected habitat and be reversible with restoration.
Release of non-LNG Fuel	Air Quality, Greenhouse Gas Emissions, Visual Quality	Air quality affected in immediate vicinity of fuel spill as VOC components of fuel volatize; however, effects would be local and reversible. Relatively negligible to negligible effects on visual quality and GHG emissions.
	Vegetation	Varies based on location and volume of fuel spill and current and climatic conditions. Potential requirement to remove vegetation to facilitate clean-up. Major spills of heavy fuel oil could spread beyond immediate vicinity even with immediate response and clean-up. Any removed vegetation would be replaced after clean-up.
	Water Quality	Surface water quality affected. Heavy fuel oil not recovered during spill response may travel long distances (kilometers) and become a source of sustained release of polycyclic aromatic hydrocarbons. Minimal to moderate and reversible long-term effects.
	Fish & Fish Habitat	Mortality in immediate vicinity of spill and risk of long-term toxicity to developing fish embryos. At-risk fish species in South Arm may be affected. However, effects to fish populations expected to be reversible within a few years. Effects to marine fish would vary based on volume of spill, location and tidal/ weather conditions. However, expected to have medium-term, reversible effects.
	Wildlife & Wildlife Habitat	Potential mortality for wildlife in direct contact with spill and those surviving could have chronic effects and lower reproductive rates. Effects expected to be reversible within a few years.
	Marine Birds	Potential mortality in direct contact with spill and those surviving could have chronic effects and lower reproductive rates. Magnitude would depend on spill extent, bird species, as well as season and location. Effects expected to be reversible within a few years. However, marine bird populations within the MSA area are considered sensitive to release of diesel fuel into marine environment with long-term effects.
	Marine Mammals	Uncertain. Potential effects of spills could be direct or indirect and vary based on number of individuals coming into contact, duration of contact and degree of weathering of the spill. Marine mammals exposed to spill are likely to experience temporary, nonlethal effects. Inhalation of some substances may cause toxic effects in marine mammals; however, the risk of exposure is considered short-term as these substances generally dissipate within a few days thereby removing the potential risk of inhalation. All effects are initially manifested at the individual level with the potential to affect population-level based on population size (e.g., SRKW population). Major spills of heavy fuel oil could result in portions spreading beyond immediate vicinity even with immediate response and clean-up, resulting in adverse toxic effects to marine mammals.
	Economy, Land & Marine Resource Use, Current Use of Land & Resources for Traditional Purposes	May restrict navigation along Fraser River, leading to substantial effect on movement of other Fraser River vessel traffic (days to weeks). A large bunker oil spill could also have substantial economic effects to CRA fisheries depending on location, time of year and extent of the spill. In addition, there would be potential effects causing displacement of marine area access and area use (medium – months), presence and availability of fish and seafood for commercial and recreational harvesting (medium – months to few years), potential vessel, gear and property damage (medium – months), presence of marine mammals for marine tourism whale watching (potential for long-term – irreversible), change to recreational environmental setting (moderate to long-term), access to preferred current use locations (medium-term – months), damage to current use vessels, equipment, cultural sites and features (medium to long-term – multi-year), availability and quality of preferred current use resources (medium to long-term), quality of current use experience (long-term)
	Socio-Community	A fuel spill due to vessel grounding or collision is likely to require external emergency response services such as CCG and Transport Canada. However, emergency response to a fuel spill on the Fraser River would place no to minimal strain to local firefighting and medical services.
	Heritage Resources	Preservation of archaeological and heritage resource, if present in the spill area, could be adversely affected. Highly unlikely to result in these effects along Fraser River shoreline as well as unlikely to result in Boundary Passage or Haro Strait.
	Human Health[386]	Potentially affected from exposure to contaminated fish. However, following a spill warning would immediately be issued to not consume fish until determined to be safe. Therefore, exposure considered negligible.

[386] This table summarizes the environmental effects of potential accidents and malfunctions. The Human Health effect captured in this table is related to chemical pathways to Human Health.

Accident and Malfunction	Valued Component	Environmental Effects
Vessel LNG Release	Air Quality, Greenhouse Gas Emissions and Visual Quality	Without ignition, the LNG would quickly disperse and have negligible effects on air quality. There would be a water vapour cloud formation causing poor visibility. With ignition, the resulting fire would release combustion emissions, affecting air and visual quality. However, effect would be local and short-term (hours to days).
	Vegetation	LNG is not persistent in the environment and is expected to dissipate. Plants may be affected by LNG (freezing) and fire but expected to regrow and recover within a few years.
	Wildlife and Wildlife Habitat	Wildlife in close proximity could be killed or injured; however, unlikely to have to population effects.
	Water Quality	Surface water within a few hundred metres of the spill may freeze or result in a subsequent pool fire, being considered moderate (short-term) effects due to temperature changes; however, as ice melts effects on water quality would be negligible (LNG would volatilize)
	Fish and Fish Habitat	Fish in immediate vicinity may freeze and also be killed or injured by heat from fire; however, this is not expected to lead to population-level effects.
	Marine Mammals	Potential injury or asphyxiation in immediate vicinity at surface of water; however, considered infrequent and fully reversible for all marine mammal populations with the exception of the SRKW.
	Marine Birds	Those in close proximity could be killed or injured from freezing if in contact with water or asphyxiation if flying through the evaporating LNG vapour; however, unlikely to have to population effects.
	Economy, Land and Marine Resource Use and Current Use of Land and Resources for Traditional Purposes	Potential damage to infrastructure and facilities in vicinity of LNG release may affect goods movement and transportation; however, should be short (hours to days). Potential restriction of marine/ fishing area access and use, (short – hours to days), potential vessel, gear, property damage and damage to cultural sites and features (medium – year to few years), presence and availability of fish and seafood for commercial and recreational harvesting (short), availability and quality of preferred current use resources (high) guided sport fishing, presence and availability of marine mammals for tourism (whale watching; long-term), quality of current use experience (high), and effects to the recreational marine environmental setting.
	Socio-community	Potential strain on local emergency services in the event of a fire of explosion; however, limited and short-lived.
	Heritage Resources	Archaeological and heritage resources in the immediate vicinity of LNG spill and fire could be adversely affected. Residual effects along the Fraser River shoreline are highly unlikely; however, there is potential for adverse effects due to grounding near Discovery and Chatham Island.
	Human Health[387]	Effects due to air quality would be negligible, as any methane or combustion emissions would be rapidly dispersed.
Vessel Collision with Smaller Vessels	Marine Resource Use	Potential to range from minor damage to small vessels to vessel replacement. Compensation would be provided by insurance carried by affected vessel owners. Potential for high magnitude of effect based on business revenue reductions incurred for commercial vessels and higher magnitude for related to an Indigenous person or community.
	Current Use of Land and Resources for Traditional Purposes	Potential damage to or loss of vessel or gear engaged in current use activities. Potential temporary interruption to access to preferred current use location and resources. Depending on vessel and capacity of Indigenous group the effect for current use could be of high magnitude and potentially medium to long-term.

[387] This table summarizes the environmental effects of potential accidents and malfunctions. The Human Health effect captured in this table is related to chemical pathways to Human Health.

TSLEIL-WAUTUTH NATION'S PART C EFFECTS ASSESSMENT TABLE FOR THE TILBURY MARINE JETTY PROJECT - DATED MAY 27 2022

TWN's Aboriginal Rights	Factors	Project Stage	Specific Project Activities	Resource	Potential Impacts	Duration	Reversible	Cumulative Impacts	Mitigations	Residual Impacts to TWN Rights - High Efficacy of Mitigations	Probability of High Efficacy of Mitigations (p=)	Residual Impacts to TWN Rights - Low Efficacy of Mitigations	Probability of Moderate to Low Efficacy of Mitigations (p=)	Impacts to TWN's Cultural Health	Total Severity and Seriousness of Impact
Right to Fish	Biophysical Factors	Construction	Construction of project infrastructure and destruction of foreshore	fish habitat	loss of juvenile sockeye/chinook habitat	permanent	no	extreme	Fish and Fish Habitat Monitoring and Mitigation Plan; Fish Habitat Offsetting Plan	Minimal loss in salmonid habitat, Minimal loss in salmonid returns/populations	0.01	Net loss of available FSC fish, impacts to SRKW, cascading impacts to TWN's cultural relationship with killer whales	0.99	Negative, decreased access to traditional foods, loss of traditional subsistence practices and teachings, impairment of relationships with killer whales	very high
Right to Fish	Biophysical Factors	Construction	Construction of project infrastructure and destruction of foreshore	fish habitat	loss of white sturgeon habitat	permanent	no	extreme	Fish and Fish Habitat Monitoring and Mitigation Plan; Fish Habitat Offsetting Plan	Minimal loss in sturgeon habitat, Minimal loss in returns/populations	0.01	Net loss of sturgeon, preclusion of population recovery and future harvest	0.99	Negative, continued restriction of TWN access to sturgeon, preclusion of future access	very high
Right to Fish	Biophysical Factors	Construction	Construction of project infrastructure and destruction of foreshore	fish habitat	loss of eulachon habitat/migratory route	permanent	no	extreme	Fish and Fish Habitat Monitoring and Mitigation Plan; Fish Habitat Offsetting Plan	Minimal loss in eulachon habitat, Minimal loss in returns/populations	0.01	Net loss of eulachon, preclusion of population recovery and future harvest	0.99	Negative, continued restriction of TWN access to eulachon, preclusion of future access	very high
Right to Fish	Biophysical Factors	Construction, Operation, Decommissioning	Acoustic pollution (dredging, pile-driving, vessel operation)	fish	loss of fish/interference with harvest, reduction of TWN sockeye/chinook harvest/preclusion of TWN from future sturgeon and eulachon harvest	long-term	yes	moderate	Fish and Fish Habitat Monitoring and Mitigation Plan including use of bubble curtains	Minimal impacts	0.30	Decrease in TWN's Lower Fraser FSC fishery and economic fisheries/Impacts to TWN's right to fish/Cascading impacts on cultural health	0.70	Negative, decreased access to traditional foods, loss of traditional subsistence practices and teachings	moderate to high
Right to Fish	Biophysical Factors	Construction, Operation	Dredging	fish habitat	loss of white sturgeon habitat	long-term	unknown due to conservation status	extreme	Fish and Fish Habitat Monitoring Plan including side scan sonar and reduced-risk work windows	Minimal impacts	0.10	Preclusion of population recovery and future harvest	0.90	Negative, continued restriction of TWN access to sturgeon, preclusion of future access	very high
Right to Fish	Biophysical Factors	Construction, Operation	Dredging	fish habitat	loss of eulachon habitat/migratory route	long-term	unknown due to conservation status	extreme	Fish and Fish Habitat Monitoring Plan including timing of work and seasonal restrictions	Minimal impacts	0.10	Preclusion of population recovery and future harvest	0.90	Negative, continued restriction of TWN access to eulachon, preclusion of future access	very high
Right to Fish	Biophysical Factors	Construction, Operation	Dredging	fish	death of fish -- sturgeon	long-term	yes	extreme	Fish and Fish Habitat Monitoring Plan including side scan sonar and reduced-risk work windows	Minimal impacts	0.10	Preclusion of population recovery and future harvest	0.90	Negative, continued restriction of TWN access to sturgeon, preclusion of future access	very high
Right to Fish	Biophysical Factors	Construction, Operation	Dredging	fish	death of fish -- juvenile salmonids and eulachon	long-term	yes	extreme	Fish and Fish Habitat Monitoring Plan including timing of work and seasonal restrictions	Minimal impacts	0.10	Preclusion of population recovery and future harvest; Reduction of TWN sockeye/chinook fishery	0.90	Negative, continued restriction of TWN access to eulachon, preclusion of future access; Negative, decreased access to traditional foods, loss of traditional subsistence practices and teachings	very high
Right to Fish	Biophysical Factors	Construction, Operation and Decommissioning	Increased marine shipping/Marine Safety Exclusion Zones	fish	interference with access to harvest, reduction of TWN sockeye/chinook harvest	Long-term	yes	extreme	Marine Access and Transportation Plan/Marine Communications Plan	Small decrease in access to TWN fisheries	0.25	Decreased access to TWN fisheries	0.75	Negative, decreased access to traditional foods, loss of traditional subsistence practices and teachings	very high
Right to Fish	Biophysical Factors	Operation	Accidents and malfunctions -spills	fish and fish habitat	death of fish - sockeye, chinook	medium-term	unknown due to conservation status and size of spill	extreme	Emergency Response Plan	Minimal impacts	0.25	Reduction of TWN sockeye/chinook fishery	0.75	Negative, decreased access to traditional foods, loss of traditional subsistence practices and teachings	likely low, low probability of extreme
Right to Fish	Biophysical Factors	Operation	Accidents and malfunctions -spills	fish and fish habitat	death of fish - sturgeon, eulachon	medium-term	unknown due to conservation status and size of spill	extreme	Emergency Response Plan	Minimal impacts	0.25	Preclusion of population recovery and future harvest	0.75	Negative, continued restriction of TWN access to eulachon and sturgeon, preclusion of future access	likely low, low probability of extreme
Right to Fish	Biophysical Factors	Operation	Accidents and malfunctions -spills	fish and fish habitat	death of crab	medium-term	unknown due to size of spill	heavy	Emergency Response Plan	Minimal impacts	0.25	Reduction of crab fishery	0.75	Negative, decreased access to traditional foods, loss of traditional subsistence practices and teachings	likely low, low probability of extreme
Right to Hunt	Biophysical Factors	Construction, Operation and Decommissioning	Increased marine shipping/Marine Safety Exclusion Zones	waterfowl	reduction of potential waterfowl hunting areas	long-term	yes	heavy	Marine Access and Transportation Plan; Marine Communications Plan	Minimal impacts	0.25	Preclusion of population recovery and future harvest	0.75	Negative, preclusion of future access	very high
Right to Hunt	Biophysical Factors	Operation	Accidents and malfunctions -spills	waterfowl	death of waterfowl	medium-term	yes	heavy	Emergency Response Plan	Minimal impacts	0.25	preclusion of population recovery and future harvest	0.75	Negative, preclusion of future access	likely low, low probability of extreme
Right to Fish and Right to Hunt	Biophysical Factors	Construction, Operation	Construction and operation (including marine shipping) related air pollution and GHGs	fish, waterfowl	acceleration of climate change, warming of Fraser River, impacts to TWN territory	permanent	no	heavy	Construction and Operational Environmental Management Plans; Air Quality Management Plan however no offsetting for GHG emissions is proposed	Decrease in FSC sockeye/chinook fishery in South Arm	0.00	Decrease in FSC sockeye/chinook fishery in South Arm; preclusion of population recovery and future harvest for eulachon, sturgeon and waterfowl	1.00	Negative, decreased access to traditional foods, loss of traditional subsistence practices and teachings	very high
Right to Fish and Right to Hunt	Biophysical Factors	Operation	LNG to be burned	fish, waterfowl	acceleration of climate change, warming of Fraser River, impacts to TWN territory	permanent	no	heavy	Construction and Operational Environmental Management Plans; Air Quality Management Plan however no offsetting for GHG emissions is proposed	Decrease in FSC sockeye/chinook fishery in South Arm; preclusion of population recovery and future harvest for eulachon, sturgeon and waterfowl	0.00	Decrease in FSC sockeye/chinook fishery in South Arm; preclusion of population recovery and future harvest for eulachon, sturgeon and waterfowl	1.00	Negative, decreased access to traditional foods, loss of traditional subsistence practices and teachings	very high
Right to maintain/practice traditional culture	Social, cultural, spiritual, experiential factors	Construction	Dredging	cultural heritage	destruction of artifacts in dredged material	permanent	no	extreme	None	potential erasure of ancestral Coast Salish culture	0.00	potential erasure of ancestral Coast Salish culture	1.00	Neutral to negative depending on if anything is destroyed	low to high
Right to maintain/practice traditional culture	Social, cultural, spiritual, experiential factors	Construction	Construction of project infrastructure and destruction of foreshore habitat	fish habitat, cultural practices	loss of juvenile sockeye/chinook habitat	permanent	no	extreme	Fish and Fish Habitat Monitoring and Mitigation Plan; Fish Habitat Offsetting Plan	Minimal loss in salmonid habitat, Minimal loss in salmonid returns/populations	0.01	reduced opportunities for knowledge transfer (teaching of fishing skills), negative impacts to TWN cultural health	0.99	Negative, decreased access to traditional foods, loss of traditional subsistence practices and teachings	very high
Right to maintain/practice traditional culture	Social, cultural, spiritual, experiential factors	Construction, Operation, Decommissioning	Construction of project infrastructure, dredging, marine shipping	fish, fish habitat, cultural practices	impact to TWN's experience of fishing	brief or permanent	yes	heavy	Various management plans; Marine Access and Transportation Plan; Marine Communication Plan	Increased stress during fishing seasons and increased competition	0.10	Increased stress during fishing seasons and increased competition; reduced opportunities for knowledge transfer (teaching of fishing skills), negative impacts to TWN cultural health.	0.90	Negative, decreased access to traditional foods, loss of traditional subsistence practices and teachings	very high
Right to maintain/practice traditional culture	Social, cultural, spiritual, experiential factors	Construction, Operation, Decommissioning	Increased marine shipping	cultural relationship with killer whales	extirpation of SRKW (underwater noise pollution, vessel strikes)	permanent	no	extreme	Marine Mammal Management Plan; Vessel Traffic Management Plan	negative impacts to TWN culture, relationships with passed ancestors, TWN identity, TWN health	0.00	negative impacts to TWN culture, relationships with passed ancestors, TWN identity, TWN health	1.00	Negative, impairment of cultural relationship with killer whales	extreme
Right to maintain/practice traditional culture	Social, cultural, spiritual, experiential factors	Construction, Operation, Decommissioning	Increased marine shipping	cultural travel	interference with cultural travel	long-term	yes	heavy	None	further circumscription of areas for traditional canoe travel	0.00	further circumscription of areas for traditional canoe travel	1.00	Negative, continue limitations on traditional TWN travel	very high
Right to maintain/practice traditional culture	Social, cultural, spiritual, experiential factors	Construction, Operation, Decommissioning	Increased marine shipping	fish and crab	reduction of TWN sockeye/chinook fishery; reduction of TWN crab fishery	long-term	unknown due to conservation status	heavy	Marine Access and Transportation Plan; Marine Communications Plan	reduced opportunities for knowledge transfer (teaching of fishing skills), negative impacts to TWN cultural health	0.00	reduced opportunities for knowledge transfer (teaching of fishing skills), negative impacts to TWN cultural health	1.00	Negative, decreased access to traditional foods, loss of traditional subsistence practices and teachings	very high
Right to maintain/practice traditional culture	Social, cultural, spiritual, experiential factors	Construction, Operation, Decommissioning	Increased marine shipping	cultural and spiritual practices	reduction in suitability of preferred location for spiritual practice; impacts to the spiritual powers of the location	long-term	yes	extreme	none	reduced opportunities for undertaking traditional cultural practices, negative impacts to TWN cultural health	0.00	reduced opportunities for undertaking traditional cultural practices, negative impacts to TWN cultural health	1.00	Negative, deceased opportunities for cultural practice at a spiritually significant location	extreme
Right to gain economic benefit from the use of territory	Social, cultural, spiritual, experiential factors	Construction, Operation	construction of facilities and loading ships	land	preclusion of TWN economic benefit from development here	permanent	yes	heavy	none	preclusion of TWN economic benefit from development here	0.00	preclusion of TWN economic benefit from development here	1.00	Negative, impacts to self-determination	moderate
Right to maintain/practice traditional culture	Social, cultural, spiritual, experiential factors	Construction, Operation, Decommissioning	Accidents and malfunctions -spills	cultural relationship with killer whales	extirpation of SRKW (poisoning of SRKW)	permanent	no	extreme	Emergency Response Plan	impacts to SRKW population due to conservation status resulting in potential negative impacts to TWN culture, relationships with passed ancestors, TWN identify and TWN health	0.25	negative impacts to TWN culture, relationships with passed ancestors, TWN identity, TWN health	0.75	Negative, decreased access to traditional foods, loss of traditional subsistence practices and teachings	extreme
Right to maintain/practice traditional culture	Social, cultural, spiritual, experiential factors	Construction, Operation, Decommissioning	Accidents and malfunctions -spills	cultural and spiritual practices	creates unsuitable conditions for ritual bathing and dissuades use of the area	long-term or permanent	unknown due to type of spill and efficacy of cleanup	extreme	Emergency Response Plan	impacts to water quality resulting in reduced opportunities for undertaking traditional practices	0.25	reduced opportunities for undertaking traditional practices, negative impacts to TWN cultural health	0.75	Negative, deceased opportunities for cultural practice at a spiritually significant location	very high
Right to maintain/practice traditional culture	Social, cultural, spiritual, experiential factors	Construction, Operation, Decommissioning	Accidents and malfunctions -spills	cultural and spiritual practices	harms or impairs the spiritual forces associated with the area	long-term or permanent	unknown due to type of spill and efficacy of cleanup	extreme	Emergency Response Plan	impacts to spiritual forces resulting in reduced opportunities for undertaking traditional practices	0.25	reduced opportunities for undertaking traditional practices, negative impacts to TWN cultural health	0.75	Negative, deceased opportunities for cultural practice at a spiritually significant location	extreme
Right to maintain/practice traditional culture	Social, cultural, spiritual, experiential factors	Construction/Operation	Increased marine shipping	cultural heritage	destruction of artifacts from increased shoreline erosion	permanent	no	extreme	Bathymetry monitoring	potential erasure of ancestral Coast Salish culture	0.50	potential erasure of ancestral Coast Salish culture	0.50	Neutral to negative depending on if anything is destroyed	low to high
Right to maintain/practice traditional culture	Social, cultural, spiritual, experiential factors	Construction, Operation	Construction and operation (including marine shipping) related air pollution and GHGs	cultural and spiritual practices	acceleration of climate change, warming of Fraser River, impacts to TWN territory	permanent	no	heavy	Construction and Operational Environmental Management Plans; Air Quality Management Plan however no offsetting for GHG emissions is proposed	Decrease in FSC sockeye/chinook fishery in South Arm	0.00	Decrease in FSC sockeye/chinook fishery in South Arm; preclusion of population recovery and future harvest for eulachon, sturgeon and waterfowl	1.00	Negative, decreased access to traditional foods, loss of traditional subsistence practices and teachings	very high
Right to maintain/practice traditional culture	Social, cultural, spiritual, experiential factors	Operation	LNG to be burned	cultural and spiritual practices	acceleration of climate change, warming of Fraser River, impacts to TWN territory	permanent	no	heavy	Construction and Operational Environmental Management Plans; Air Quality Management Plan however no offsetting for GHG emissions is proposed	Decrease in FSC sockeye/chinook fishery in South Arm; preclusion of population recovery and future harvest for eulachon, sturgeon and waterfowl	0.00	Decrease in FSC sockeye/chinook fishery in South Arm; preclusion of population recovery and future harvest for eulachon, sturgeon and waterfowl	1.00	Negative, decreased access to traditional foods, loss of traditional subsistence practices and teachings	very high
Right to self-governance and self-determination	Biophysical Factors/Social, cultural, spiritual, experiential factors	Construction/Operation	Impacts to Tsleil-Waututh Fisheries	fish	Erosion of Tsleil-Waututh's ability to practice self-governance	Permanent	no	extreme	Various mitigations for impacts to fish and fishing	Decrease in Tsleil-Waututh's ability to practice self-governance and self-determination	0.00	Erosion of Tsleil-Waututh's ability to practice self-governance and self-determination.	1.00	Negative, decreased autonomy, impacts on rights, impacts on Governmental sovereignty; reduced access to traditional sources of food.	extreme
Right to fish	Specific Sites or Areas	Construction, Decommissioning	Construction and decommissioning of project infrastructure	TWN's sockeye/chinook fishery	interference with TWN's sockeye/chinook fishery	long-term	no	heavy	Marine Access and Transportation Plan; Marine Communications Plan	Exclusion of TWN from a preferred fishery location	0.25	Exclusion of TWN from a preferred fishery location	0.75	Negative, decreased access to traditional foods, loss of traditional subsistence practices and teachings	very high
Right to fish	Specific Sites or Areas	Operation	Berthing	TWN's sockeye/chinook fishery	interference with TWN's sockeye/chinook fishery	long-term	no	heavy	Marine Access and Transportation Plan; Marine Communications Plan	Exclusion of TWN from a preferred fishery location	0.25	Exclusion of TWN from a preferred fishery location	0.75	Negative, decreased access to traditional foods, loss of traditional subsistence practices and teachings	very high
Right to fish	Specific Sites or Areas	Operation	Increased marine shipping	TWN's sockeye/chinook fishery	interference with TWN's sockeye/chinook fishery	long-term	no	heavy	Marine Access and Transportation Plan; Marine Communications Plan	Exclusion of TWN from a preferred fishery location	0.25	Exclusion of TWN from a preferred fishery location	0.75	Negative, decreased access to traditional foods, loss of traditional subsistence practices and teachings	very high