

Summary Assessment Report

for the Pattullo Bridge Replacement Project (PBRP)

With respect to the Application by British Columbia Ministry of Transportation and Infrastructure (MOTI) for an Environmental Assessment Certificate pursuant to the *Environmental Assessment Act*, S.B.C. 2002, c.43

April 04, 2019



1 INTRODUCTION

This Summary Assessment Report (Summary Report) provides an overview of the Environmental Assessment (EA) for the proposed Pattullo Bridge Replacement Project (PBRP) as conducted by the Environmental Assessment Office (EAO). The Summary Report is prepared as an overview of the Assessment Report that meets the requirements of the *Environmental Assessment Act* (Act) and discusses the key findings and conclusions of the EA. The Summary Report makes direct references to sections of the Assessment Report, where more details can be found.

In British Columbia (BC), the decision whether to issue an EA Certificate (EAC) is made under the Act by two deciding ministers, one of which is always the Minister of Environment and Climate Change Strategy and another as set out in the regulation. For PBRP, the second deciding minister is the Minister of Municipal Affairs and Housing. The EAO has prepared the Assessment Report, Summary Report, proposed Table of Conditions (TOC) and a Certified Project Description (CPD) (together, the Decision Materials) for consideration by provincial Ministers.

2 PROJECT DESCRIPTION

On August 14, 2018, the British Columbia Ministry of Transportation and Infrastructure (MOTI) applied to the EAO for an EAC to replace the existing four-lane Pattullo Bridge, built in 1937, with a new four-lane bridge. The new bridge would be constructed about 100 metres (m) upstream of and roughly parallel to the existing bridge location that connects the City of Surrey (Surrey) and the City of New Westminster (New Westminster), BC crossing the Fraser River (Figure 1 and Figure 2). Like the existing bridge, the new bridge will cross the Fraser River and connect McBride Boulevard in New Westminster and King George Boulevard in Surrey. The new connections and approaches of the bridge components include access roads to and/or from McBride Boulevard, Royal Avenue, and East Columbia Street in New Westminster and approach spans connecting King George Boulevard and roadway connections accessing Highway 17 in Surrey. These connections and approaches would be designed and constructed to reduce traffic on local residential streets to access the river crossing.

The new bridge will meet current seismic and road design standards, have wider vehicle lanes, and dedicated lanes for pedestrians and cyclists. The new bridge structure would have a maximum of four in-river piers (in comparison to the existing bridge which has six in-river piers), the locations of which will be determined during final project design. The six in-river piers of the existing bridge would be removed to a level below the water surface when the existing bridge is demolished with the intention of avoiding potential impediments to marine navigation and fishing.

Construction of the new bridge is expected to begin in 2019 and would be open to traffic and normal operations in 2023. The demolition and removal of the existing bridge is expected to be completed by 2024. While the new bridge is under construction, the existing bridge would continue to be open to traffic

to minimize disruption to the movement of vehicles, people, goods and services. Once the new bridge is opened to traffic, the existing bridge structure will be demolished and removed. Operations and maintenance activities will be ongoing for the life of the PBRP.

Consistent with the MOTI's tolling policy announced on September 1, 2017, the new bridge will not be tolled. Once completed, the PBRP will be owned, operated and maintained solely by the Province of BC.

More information on the proposed design, components and project phases of the PBRP is summarized in Section 2 of the Assessment Report.

The PBRP is located within the asserted traditional territories of the following 14 Indigenous groups¹:

- Cowichan Tribes;
- Halalt First Nation;
- Katzie First Nation;
- Kwantlen First Nation;
- Kwikwetlem First Nation;
- Lake Cowichan First Nation;
- Lyackson First Nation;
- Musqueam Indian Band;
- Penelakut Tribe;
- Semiahmoo First Nation;
- Squamish Nation;
- Stz'uminus First Nation;
- Tsawwassen First Nation; and
- Tsleil-Waututh Nation.

¹ "Indigenous groups" means those Aboriginal entities identified in Schedule B of the Section 11 Order for the proposed Pattullo Bridge Replacement Project, issued August 8, 2017, as defined in that Order.

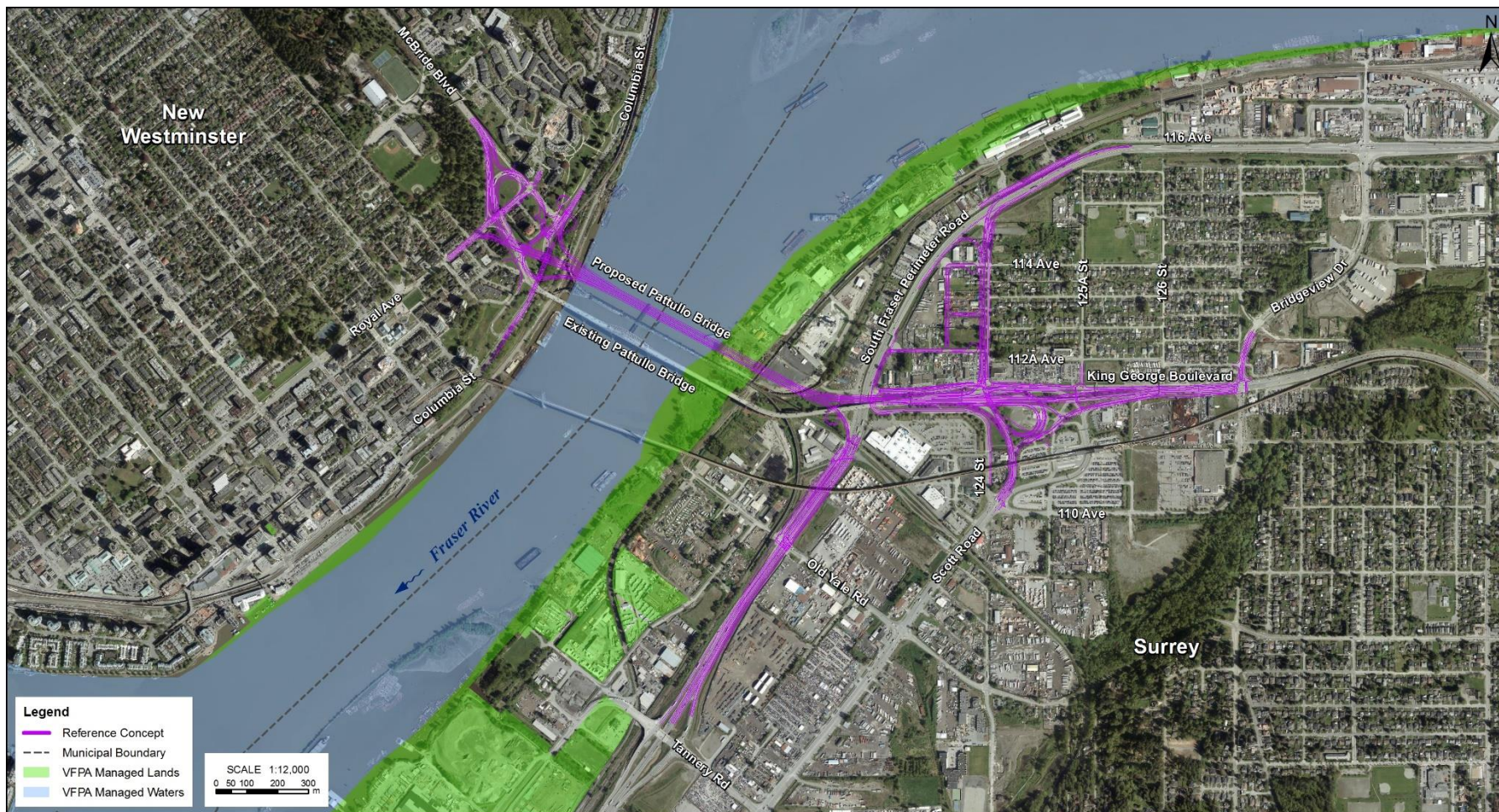


Figure 1 – Location of Pattullo Bridge Replacement Project crossing over Vancouver Fraser Port Authority Managed Lands and Waters.



Figure 2 – Pattullo Bridge Replacement Project within Greater Vancouver Area and Vancouver Fraser Port Authority Managed Lands and Waters.

3 STRATEGIC CONTEXT

The PBRP is a critical component of Metro Vancouver's long-range plans to invest in multi-modal transportation. The Application notes that this Fraser River crossing is an integral aspect of the Pattullo corridor and a vital support for Metro Vancouver's role as one of Canada's integral Asia Pacific Gateways. In combination with Highway 17, the Pattullo corridor provides important goods movement and trade linkages between the Roberts Bank Terminal, the Fraser River Trade Area and adjacent communities. The Pattullo corridor is also an important link for local travel between New Westminister and Surrey, the two expanding urban centres for residential and commercial activities on either side of the Fraser River. When the PBRP is complete, it would be part of the regional transportation network (Figure 2).

The South Coast British Columbia Transportation Authority (TransLink) was the initial proponent for PBRP until MOTI took over responsibility for PBRP on February 16, 2018. TransLink first began defining the scope and reviewing options for PBRP in 2006 and a Joint Review process was initiated in 2013 that involved New Westminister, Surrey and other relevant agencies, Indigenous groups, stakeholders and the public, prior to entering the EA. Twenty-five alternatives to rehabilitating or replacing the existing bridge were considered through this review and engagement process. Cost benefit analysis determined that there was little value in rehabilitating the existing bridge and that the existing bridge would need to be closed by 2024 given its rate of deterioration. Several bridge replacement options were short-listed for consideration, followed by four bridge types, including a clear span bridge design, being evaluated against the goals and objectives for the project. It was determined that a clear span bridge would have greater visual impacts from both land and water viewpoints and would have higher costs compared to the design proposed in the Application. The Metro Vancouver's Mayor's Council on Regional Transportation chose the PBRP as the preferred option, which was then proposed in MOTI's EAC Application to the EAO.

4 ENVIRONMENTAL ASSESSMENT PROCESS

The PBRP EA has included extensive engagement with government agencies, Indigenous groups and the public on potential environmental, economic, social, heritage and health effects, including cumulative effects, as required under the Act. This section describes key steps in the EA for the PBRP:

- On November 9, 2016, the EAO determined that the PBRP was reviewable pursuant to the Reviewable Projects Regulation as it 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. Consequently, the EAO issued an order under Section 10 of the Act requiring the PBRP to undergo an EA;
- On June 6, 2017, the EAO issued a letter under Section 11 of the Act that outlined the requirements for public consultation on the Valued Components document;

- On August 8, 2017, the EAO issued an order under Section 11 of the Act which set out the scope, procedures and methods for the EA, including requirements for consultation with Indigenous groups;
- On March 23, 2018, the EAO issued to MOTI the approved Application Information Requirements that specified mandatory information that must be included in an EAC Application for the PBRP;
- On August 14, 2018, the EAO accepted MOTI's Application for an EAC and the 180-day Application review phase for the PBRP began;
- On April 4, 2019, the EAO's Executive Director extended the 180-day Application Review timeline by 53 days in order to engage the public on the draft Decision Material; and
- On April 4, 2019, the EAO referred the PBRP to the Ministers for decision.

In 2016, the EAO established a technical advisory working group (Working Group) to review key documents and provide expert advice during the EA. The Working Group included representatives of provincial, federal and local government agency staff with the mandates and skill sets relevant to the review of the PBRP, and representatives of Indigenous groups identified in Schedule B of the Section 11 Order. Information on the membership of the Working Group is in Appendix 1 of the Assessment Report.

The PBRP is not subject to a federal EA, because the PBRP is not a designated project described in the federal Regulations Designating Physical Activities. A Project and Environmental Review (PER) process will be conducted on the PBRP, however, by the Vancouver Fraser Port Authority (VFPA), as the PER process applies to all proposed physical works and activities on federal lands and waters partially or wholly within the VFPA. The EAO and VFPA agreed to a harmonized approach to their environmental reviews of the PBRP and to coordinate Indigenous engagement and consultation activities. The VFPA actively participated in the EAO's Working Group and intends to consider the information gathered during the provincial EA process in its assessment of MOTI's Application for a PER Permit.

The VFPA must ensure that proposed physical developments and activities of PBRP meet Section 67 of the *Canadian Environmental Assessment Act 2012* (CEAA 2012) requirements and must make a determination of the significance of adverse environmental effects that may be caused by the PBRP, including potential effects on Indigenous groups of any change that may be caused to the environment, pursuant to Section 5(1)(c) of CEAA 2012. Transport Canada and Fisheries and Oceans Canada may also issue authorizations pursuant to the federal *Navigation Protection Act* and the *Fisheries Act* respectively, given the potential for PBRP to impact navigation on the Fraser River and fish and fish habitat which would require those agencies to make a determination of significance of adverse environmental effects of the PBRP in accordance with Section 67 of CEAA 2012.

In addition to the requirement for an EAC, MOTI also requires various permits, approvals and authorizations which relate primarily to disturbance to land, water, fish and fish habitat, and city and regional infrastructure, and temporary disruption to marine navigation. Additional details of required authorizations for the PBRP are summarized in Section 3 of the Assessment Report.

5 KEY CONCLUSIONS OF THE ENVIRONMENTAL ASSESSMENT

VALUED COMPONENTS AND INTERMEDIATE COMPONENTS

The EAO's methodology relies on Valued Components (VCs) and Intermediate Components (ICs) as the framework for assessing project effects. VCs are those elements of the natural and human environments considered by the proponent, public, Indigenous groups, scientists and other technical specialists, and government agencies involved in the EA process to have scientific, conservation, ecological, economic, social, cultural, archaeological or other importance. ICs are part of the cause-effect pathways between a proposed project and VCs. The assessment of ICs informs the assessment of relevant VCs, and enables conclusions of significance to be completed for VCs. The Assessment Report for the PBRP assesses the VCs and ICs included in the Application and is organized as per Table 1.

Table 1: Valued Components and Intermediate Components Assessed

Valued Components VC's	Intermediate Components IC's
Environmental Effects	Fraser River Hydraulics and Morphology (Section 6) Surface Water and Sediment Quality (Section 7) Soil and Groundwater (Section 8) Shading (Section 13) Lighting (Section 13) Air Quality (Section 16) Noise and Vibration (Section 17)
Fish and Fish Habitat (Section 5)	
Vegetation (Section 9)	
Wildlife (Section 10)	
Economic Effects	
Economic Activity (Section 19)	
Social Effects	
Land use (Section 12)	
Visual quality (Section 13)	
Marine use (Section 11)	
Heritage Effects	
Heritage Resources (Section 14)	
Health Effects	
Physical Determinants of Health (Section 15)	
Social Determinants of Health & Community Cohesion (Section 18)	

The EAO's Assessment Report assessed the impacts of the PBRP on all VCs and ICs, identified key mitigation measures for each and reached conclusions on the residual effects. The EAO concluded that potential adverse effects of the PBRP would generally be negligible to minor, after mitigations, and not significant. To ensure the residual adverse effects of the PBRP are adequately avoided, minimized or offset, the EAO proposes 20 conditions in the TOC and a CPD to be included in an EAC which, if issued, would

become legally binding and subject to compliance and enforcement oversight.

The remainder of this section provides a summary of the key themes that, due to their complexity and level of attention given by Indigenous groups and the Working Group, became the main focus of the EA: fish and fish habitat, marine use, and heritage resources. The Assessment Report includes a detailed assessment and discussion of potential residual adverse effects, the key issues raised, and the status of resolution. Appendix A summarizes the nature and extent of residual effects on all VCs and ICs as concluded by the EAO.

FISH AND FISH HABITAT

The PBRP is located in a section of the Fraser River that narrows, resulting in increased velocity of river currents. Most of the key fish species of the Local Study Area (LSA) and Regional Study Area (RSA) migrate through this section of the Fraser River. All five species of salmon use the Fraser River to migrate to streams as adults and pass through to rearing habitats as juveniles; however, none use the Fraser River near the PBRP area as rearing habitat. White sturgeon likely move through this section of the Fraser River in the spring/summer and upstream in the fall/winter in response to food availability and spend time here as adults and juveniles for feeding and use of refuge habitat. Eulachon migrate through this section of the Fraser River to spawn upstream in the Fraser River primarily during April and May, and the eggs and larvae subsequently float downstream through the LSA to the estuary soon afterwards.

Indigenous groups have reported fishing around the PBRP primarily for salmon, eulachon, sturgeon and trout. During the EA, Indigenous groups raised concerns about: potential impacts to fish and fish habitat due to underwater noise from construction and demolition activities during critical fish life stages, including impacts to white sturgeon presence; uncertainty as to whether Eulachon spawn in the area; and the loss of valuable fish habitat. Indigenous groups also expressed concern that potential impacts to salmon habitat could impact the ability of future generations of Indigenous peoples to harvest salmon for food and cultural purposes. The EAO is aware that MOTI completed the initial phase of an eulachon study in 2018, in collaboration with Indigenous groups, and will be developing the next phase of the study in consultation with Indigenous groups.

The EAO concluded that PBRP could impact fish and fish habitat through a variety of activities during the construction and demolition phases. The EA examined potential project effects from the construction and demolition as well as operation of the PBRP and concluded that there would be residual adverse effects from disturbance to aquatic life from underwater noise exposure and changes to aquatic and riparian habitat.

HABITAT

The EAO concluded that construction of the new bridge and demolition of the current bridge could result in loss and alteration of aquatic and riparian habitat. These predicted changes could be short-term (for example, from temporary access and lay-down areas) or long-term (for example, from demolition of the existing bridge).

The PBRP could potentially result in the loss of approximately 2,350 square metres (m²) of aquatic habitat within the mainstem Fraser River due to the installation of pile footings for the new piers. The Project boundary overlaps with approximately 7,700 m² of aquatic habitat in Pattullo Channel, and the existing bridge passes over top of the channel. Removal of the current bridge is expected to result in a reduction in shading over the lowermost reaches of Pattullo Channel, and installation of piers for the new bridge has the potential to result in the alteration of approximately 1,100 m² of aquatic habitat associated with a side channel that feeds into Pattullo Channel. An estimated 77 m² of fish bearing aquatic habitat and 224 m² of non-fish bearing aquatic habitat among the upland tributaries are also predicted to be altered or lost by PBRP.

A total of 74,078 m² of riparian habitat in the LSA could be potentially lost or altered by PBRP. Of that, 32,572 m² of that riparian area is associated with non-fish bearing wetted ditches and consists primarily of grasses. The other 41,507 m² of riparian habitat found beside fish bearing tributaries consists primarily of non-native vegetation and most of that green space is regularly mowed and trimmed.

MOTI proposed mitigation measures to reduce the effects of the loss or alteration of aquatic and riparian habitat on fish and fish habitat, including avoidance of upland fish-bearing watercourses, re-vegetation of riparian areas, and a fish and wildlife habitat offset plan which would offset a greater amount of aquatic and riparian habitat than is predicted to be lost.

UNDERWATER NOISE

The EAO concluded that instream works represented a short-term physical risk to fish species during the construction and demolition phases from excavation and piling installation. While the physical risk of injury to fish is limited, measures have been proposed to mitigate the potential effects to key fish species that use the instream area as a migration corridor and holding area. To mitigate potential noise effects, MOTI will be developing a noise and vibration plan as part of the Construction Environmental Management Plan and will monitor fish presence in the project area as part of the Fish and Fish Habitat Monitoring and Mitigation Plan, which the EAO has proposed as conditions. The Fish and Fish Habitat Monitoring and Mitigation Plan will include the use of side scanning sonar to monitor for the presence of sturgeon, the implementation of a monitoring system to assess the effectiveness of noise mitigations, and delineation of a sensitive habitat exclusion zone around fish bearing upland tributaries.

THE EAO'S CONCLUSIONS AND PROPOSED CONDITIONS

In consideration of the factors noted above, the EAO believes there would be a short-term residual adverse effect to fish due to underwater noise and a residual adverse effect resulting from the loss of aquatic and riparian fish habitat, and that these residual effects would not be significant. In response to concerns raised by Indigenous groups, and to mitigate potential residual adverse effects, the EAO proposes conditions that require MOTI to develop the following plans:

- A Fish and Fish Habitat Monitoring and Mitigation Plan (Condition 11) which requires MOTI to: identify reduced-risk work windows and the work that would occur within, and outside, of

these windows; monitor for fish presence during construction and demolition; identify measures to mitigate the impacts to fish and fish habitat; require the completion of the eulachon study prior to construction; and, incorporate Indigenous traditional knowledge in the design of the above activities; and

- A Fish and Wildlife Habitat Offsetting Plan (Condition 12) which requires MOTI to develop a plan for offsetting the loss of fish habitat from PBRP. The plan, which would be developed in consultation with Indigenous groups, would: identify proposed fisheries offsets; include a monitoring program to assess and evaluate the effectiveness of offsetting measures; and, incorporate Indigenous traditional knowledge in the design of the above activities.

Considering the analysis summarized above and discussed further in Section 5 (fish and fish habitat) of the EAO's Assessment Report and having regard to the proposed conditions and associated mitigation measures, the EAO is satisfied that the PBRP would not have significant adverse effects on fish and fish habitat.

MARINE USE

Construction of the new bridge and demolition of the existing bridge have the potential to temporarily affect Indigenous and non-Indigenous fisheries and marine use in the Fraser River. The marine activities in the PBRP area currently include commercial fishing, shipping, barging and towing, log storage and handling, recreational fishing and other marine recreation. Indigenous fisheries and marine use activities include commercial, domestic and food, social and ceremonial purposes and includes licensed fishing.

The construction and installation of the up to four in-river piers is expected to have the greatest impact on marine use, however MOTI indicated that the preferred placement of the piers would provide a clear span over the navigation channel to preserve marine navigation. Construction of the new bridge is estimated to take approximately 44 months. During the main pier construction and deck installation, marine transportation vessels would deliver materials such as piles and aggregate and remove spoil from in-stream construction locations. During demolition, which is estimated to take approximately 12 months, several barges and tugboats would transport materials to deposition sites.

Temporary restrictions on navigation within the PBRP area, including speed restriction and course alteration, would be required during construction and demolition to ensure the safety of all vessels transiting the narrower navigational channel.

Mitigation measures proposed to reduce potential adverse effects include: establishing a Navigation Protection Zone during construction and demolition within which no permanent works or impacts to navigation during the operational phase of the PBRP are permitted, and maintenance of navigational passage during construction and demolition; developing construction and demolition staging plans describing how these activities would be staged and managed; developing a marine access management plan that describes the measures to minimize potential construction and demolition-related access effects;

and, continuing to consult Indigenous groups in the development and implementation of mitigation measures and construction and demolition schedules and timing.

Construction and demolition activities are expected to have a low magnitude effect on commercial and recreational marine users because the size of the marine area affected by construction and demolition is small relative to the area utilized by commercial and recreational marine users. Removal of the existing bridge and its six in-river piers is expected to improve overall navigability in this area once the new bridge is built.

During the EA, Indigenous groups expressed concerns with potential impacts to Indigenous fishing during construction and emphasized the importance of coordinating construction and demolition activities with Indigenous fishery openings to avoid or minimize effects on fishing and navigation.

The EAO proposes a condition requiring MOTI to develop a Marine and Fisheries Access Management Plan (Condition 13) to minimize or mitigate disruptions caused by PBRP for members of Indigenous groups or for commercial fisheries. This plan will also include methods to monitor the effects of the MOTI's marine-based activities on Indigenous groups, as well as a complaint resolution process and compensation regime to ensure loss or damage to commercial traps or other fishing equipment is minimized. In addition, the plan would require MOTI to outline how PBRP will avoid or mitigate disruption to marine access caused by construction or demolition activities for members of Indigenous groups to carry out traditional use activities.

Considering the analysis summarized above and discussed in Section 11.1 (marine use) of the EAO's assessment report and having regard to the proposed conditions and associated mitigation measures, the EAO is satisfied that PBRP would not have significant adverse residual effects on marine use.

HERITAGE RESOURCES

PBRP is in an area with a long history of human habitation and high archaeological value. There are many buried heritage resource sites with evidence of extensive disturbance and there is high potential for other disturbed and undisturbed archaeological deposits to be encountered within the LSA. Based on early historical accounts, it appears that the village of *q'əq'əyt* [alternatively *Kikayt*, *qəqəyt*, *qiqá:yt*, *Qaxqa'yət*, *Qayqayt*, *qiq8*, *qiqéyt*]², crossed through the Surrey side of the LSA. It appears that *q'əq'əyt* is represented in archaeological sites near and immediately north of the existing bridge, although the exact extent of *q'əq'əyt* is unknown and has not been fully documented. *q'əq'əyt* is identified as having both cultural and spiritual importance for Indigenous communities, including for seasonal activities such as fishing, and collecting food and plants.

² The spelling of the village site is unique to each Indigenous group. For clarity, this report will use *q'əq'əyt* when referring to the site. Where reference is made to the village site by a specific Indigenous group, the spelling used by that Indigenous group will be used.

The EAO concluded that during construction and demolition of PBRP, ground disturbance may result in an increased risk of disturbance or loss of heritage resources. Construction and demolition of bridge piers would also result in an increased risk of disturbance to archaeological sites along the shoreline of the Fraser River due to localized shoreline or bank erosion.

While the effects to any specific site disturbed or destroyed permanent and irreversible, the information collected prior to construction, having remains and chance find protocols in place, as well as protections under the *Heritage Conservation Act*, limit the number of sites potentially affected.

During the EA, MOTI provided supplemental information that predicted limited changes to river velocities, water levels, or flow splits at the existing bridge are expected to occur, and that PBRP is not expected to result in any substantial changes in river velocity or bed elevations at these locations of interest. The EAO is of the view that the potential exists for archaeological resources to be exposed and disturbed along the shoreline, which could result in changing land and river use patterns by animals, people and plants, and may impact archaeological resources. To address any uncertainty for potential impacts of shoreline and bank erosion on archaeological resources, Condition 15 includes a requirement to conduct a shoreline archaeological survey prior to construction and demolition to identify potential cultural and archaeological resources and better understand the potential for effects to these resources due to erosion and deposition of sediment.

During the EA, Indigenous groups raised concerns regarding potential impacts to the historical village of *q'əq'əyt*. Kwantlen First Nation identified *qayqayt* as being of high cultural importance and commented that the Kwantlen community lived in *qayqayt* up until the 1950s. Kwantlen First Nation also noted that industrialization of the area, including the building of the existing bridge, has impacted Kwantlen First Nation's ability to access sites along the shore and fish in the area. Musqueam Indian Band reported that *Qiqéyt* was the epicentre of an area that was important for wide range of important activities, given its location just above the split of the river into the North Arm and South Arm, and also expressed concerns that construction activities could impact *Qiqéyt*. In response, MOTI committed to undertake further archaeological impact assessment (AIA) work to better understand the potential impacts of construction and demolition on *q'əq'əyt*, as well as committing to a collaborative management approach with Indigenous groups to ensure that they are informed and involved in decisions pertaining to archaeological resources.

The EAO proposes Condition 15: Cultural and Archaeological Resources Management Plan, which requires the completion of additional AIA work to better understand the extent of the archaeological resources that may be impacted by construction and demolition activities. The additional fieldwork is required to be conducted in consultation with Indigenous groups. Further to this, access is addressed in Condition 14: Access Management Plan, where MOTI would be required to avoid or mitigate any disruption caused by construction or demolition to the access for members of Indigenous groups to carry out land-based traditional use activities. The Certified Project Description will also constrain the number of land-based piers that can be built on the Surrey-side of the Fraser River, which would result in a reduction of the

number of piers originally proposed during the EA. The EAO also made revisions to the CPD, at the request of Musqueam Indian Band, to exclude the use of barge landing sites from key culturally and ecologically significant areas on the Surrey side of the Fraser River.

Indigenous groups raised concerns regarding the potential exhumation of ancestral remains during construction of PBRP. Tsleil-Waututh Nation stated that while the proposed mitigation methods outlined in the Application may limit destructive impacts to sites, including sites that contain ancestral remains, they do not completely eliminate the potential impacts. Musqueam Indian Band disagreed with the conclusions presented in the Application that adverse effects to ancestral remains and cultural heritage would be minimal and that the proposed mitigation measures would be highly effective.

In the EAO's proposed Condition 15: Cultural and Archaeological Resources Management Plan, the EAO has required MOTI to develop and implement an ancestral remains protocol in the event ancestral remains are encountered. Condition 15 would also include provisions for training employees and contractors of the PBRP on cultural sensitivity, confidentiality and recognition of archaeological and historical heritage values. The EAO has also proposed Condition 8: Involvement of Indigenous groups in construction and demolition monitoring to ensure oversight by Indigenous groups in the protection of cultural sites. MOTI has committed to consulting with Indigenous groups on heritage resources as part of its collaborative management strategy. MOTI would also be required to obtain permits under Section 12 of the HCA, which authorizes the removal of archaeological deposits once investigations are complete, and Section 14, which requires archaeological permits to conduct the additional AIA work prior to construction.

Considering the above analysis and the conditions identified in the CPD and TOC conditions, (which would become legally binding if an EAC is issued), the EAO is satisfied that PBRP will not result in significant adverse effects on heritage resources.

6 INDIGENOUS CONSULTATION

The EAO examined potential impacts of PBRP on asserted Aboriginal rights and title (Aboriginal Interests) and produced an Indigenous Consultation Report (Part C of the Assessment Report), which is included as part of the Decision Materials for Ministers. Part C includes a detailed summary of the consultation that occurred throughout the EA, the issues raised by Indigenous groups, the relevant mitigation and accommodation measures, and the EAO's assessment of the seriousness of the potential impacts on each Indigenous group's Aboriginal Interests. A summary of Part C, including the EAO's consultation, key issues raised by Indigenous groups, and the EAO's conclusions about the potential impacts of PBRP on Aboriginal Interests is provided in this section.

Throughout the EA, the EAO consulted with 14 Indigenous groups identified in Schedule B of the Section 11 Order and listed in Section 2 of this Report at the deep end of the Haida consultation spectrum. These Indigenous groups were invited to participate as members of the working group, comment on and collaboratively develop EA documents, and meet directly with the EAO to discuss issues and concerns. The

EAO also delegated some procedural aspects of Indigenous consultation to MOTI.

The EAO also consulted Indigenous groups on Schedule C of the Section 11 order at the notification level. The Schedule C Indigenous groups are Seabird Island Band and People of the River Referrals Office, which includes Soowahlie, Shxw'ow'hamel First Nation and Skawahlook First Nation. The EAO shared information with Schedule C groups and notified them of key project milestones.

Some of the general themes and issues raised by Indigenous groups during the review of PBRP were:

- Impacts to fish and fish habitat, in particular, impacts to eulachon, white sturgeon and salmon;
- Alternative means to undertaking the project in order to minimize the number of piers in the river;
- EA process and methodology, including the assessment of impacts to Aboriginal Interests;
- Potential social and cultural impacts;
- Cumulative effects and the high volume of new and proposed major projects on the Fraser River;
- Accidents and malfunctions, including spills and other potential effects to water quality during construction;
- Access restrictions to areas important for practice of Aboriginal rights, including fishing areas during construction and demolition;
- Protection of archaeological and heritage resources;
- Procurement and employment opportunities; and
- Need for cultural awareness and project-related participation opportunities.

Section 14 of the assessment report includes a summary of each of these concerns as they relate to potential impacts on Aboriginal Interests (that is, hunting, trapping, gathering, fishing and marine harvesting, other traditional and cultural practices, Aboriginal title), as well as other interests (accidents and malfunctions, socio-economic issues, cumulative effects and so forth). Relevant commitments by MOTI, and the EAO's conditions and responses, where available, are presented, along with accommodation measures, in relation to how they would address key Aboriginal Interests and concerns.

The Indigenous Consultation Report includes sections that describe the key concerns raised by each Indigenous group, the consultation undertaken with each Indigenous group, and the EAO's conclusions about the potential impacts of PBRP on each Indigenous Group's Aboriginal Interests.

In addition to discussing a range of concerns related to the potential impacts of PBRP, many Indigenous groups also raised a concern about on-going opportunities to be consulted if PBRP were to proceed. The EAO has proposed several conditions that include management and monitoring plans requiring consultation with Indigenous groups, and the EAO has also proposed a condition further requiring that opportunities be offered for Indigenous groups to participate in monitoring of construction and demolition activities that may affect traditional use and related environmental values (Condition 8).

Specific to the concerns of Indigenous groups related to a potential disruption of access to fishing on the Fraser River, and the number of in-river piers of the new bridge, the EAO has proposed the Marine and Fisheries Access Management Plan (Condition 13) that would include a description of how any disruption to an Indigenous group's access caused by PBRP would be avoided, mitigated or offset, a description of how potential disruptions to commercial fisheries or Indigenous fishers would be mitigated or avoided, and how construction and demolition schedules for marine-based activities would be communicated.

The EAO also proposes several other conditions that would serve to address concerns raised by Indigenous groups' interests. These proposed conditions include:

- Cultural and Archaeological regarding potential impacts of PBRP, including requiring consultation with Indigenous groups on conditions that are related to Aboriginal Resources Management Plan (Condition 15) to monitor and mitigate impacts to archaeological and cultural sites and resources from both the construction of the bridge and demolition of the existing bridge, specifically in relation to the culturally significant village site;
- Indigenous Cultural Recognition Plan (Condition 16) to require involvement of Indigenous groups in recognizing and commemorating heritage sites, and describe the process to identify, explore and plan for PBRP-related opportunities for cultural awareness, education, interpretation and commemoration;
- Fish and Fish Habitat Monitoring and Mitigation Plan (Condition 11) to mitigate impacts to culturally important fish such as eulachon, salmon and sturgeon;
- Fish and Wildlife Habitat Offsetting Plan (Condition 12) requiring that suitable habitat is provided of equal to or greater than the habitat area that is lost;
- Engagement and Reporting (Condition 18) to ensure on-going engagement and reporting on how issues raised have been addressed throughout construction and demolition;
- Indigenous Training, Employment and Procurement Plan (Condition 17) that will describe the methods for communicating training, employment and procurement opportunities to Indigenous groups; and
- Construction and Demolition Environmental Management Plans (Conditions 9 and 10) to mitigate potential effects related to invasive vegetation, vegetation restoration, noise and vibration, light effects, visual quality, erosion, sediment and water management.

Other proposed conditions referenced throughout this report require consultation with Indigenous groups on the development and implementation of the plans and condition requirements.

The EAO is also aware that MOTI and Indigenous groups are in continued discussions regarding aspects including, but not limited to, the completion of the eulachon study, habitat offsetting, and a collaborative management strategy related to heritage resources.

IMPACT ASSESSMENT

Impacts on Aboriginal Interests were assessed for each individual Indigenous group and for each category of rights (for example, fishing, hunting and trapping, gathering, and other traditional and cultural interests), as well as other rights and interests proposed by Indigenous groups to be assessed. These impacts are described based on the level of seriousness of potential impacts after mitigation, defined as follows:

- Negligible impact – no detectable impact or any change from current conditions;
- Minor impact – ability to exercise the right is minimally disrupted;
- Moderate impact – ability to exercise the right has been diminished or disrupted; and
- Serious impact – ability to exercise the right has been significantly diminished.

The EAO recognizes that the potential impacts on any Indigenous group may vary in time and space; that is, impacts on Aboriginal Interests in one area of an Indigenous group's territory are not the same as elsewhere, and impacts during construction are not the same as during operations.

Table 2: Summary of the EAO's conclusions for impacts to Aboriginal Interests by Indigenous group

Indigenous Group	Assessed Impact on Aboriginal Interest				
	Fishing	Hunting and Trapping	Plant Gathering	Other Traditional and Cultural Interests	Greatest Assessed Impact on Aboriginal Interests
Cowichan Tribes	Negligible-to-minor	Negligible	Negligible	Negligible	Fishing: Negligible-to-minor
Halalt First Nation	Negligible-to-minor	Negligible	Negligible	Negligible	Fishing: Negligible-to-minor
Katzie First Nation	Negligible-to-minor	Negligible	Negligible	Negligible	Fishing: Negligible-to-minor
Kwantlen First Nation	Negligible-to-minor	Negligible	Negligible	Moderate	Other traditional and cultural interests: Moderate
Kwikwetlem First Nation	Minor-to-moderate	Negligible	Negligible	Moderate	Other traditional and cultural interests: Moderate
Lake Cowichan First Nation	Negligible-to-minor	Negligible	Negligible	Negligible	Fishing: Negligible-to-minor
Lyackson First Nation	Negligible-to-minor	Negligible	Negligible	Negligible	Fishing: Negligible-to-minor
Musqueam Indian Band	Minor-to-moderate	Negligible	Negligible-to-minor	Cultural continuity and sense of place and identity*	Fishing: Minor-to-moderate
Penelakut Tribe	Negligible-to-minor	Negligible	Negligible	Negligible	Fishing: Negligible-to-minor
Semiahmoo First Nation	Negligible-to-minor	Negligible	Negligible	Negligible	Fishing: Negligible-to-minor

Indigenous Group	Assessed Impact on Aboriginal Interest				
	Fishing	Hunting and Trapping	Plant Gathering	Other Traditional and Cultural Interests	Greatest Assessed Impact on Aboriginal Interests
Squamish Nation	Negligible-to-minor	Negligible	Negligible	Negligible	Fishing: Negligible-to-minor
Stz'uminus First Nation	Negligible-to-minor	Negligible	Negligible	Negligible	Fishing: Negligible-to-minor
Tsawwassen First Nation	Minor-to-moderate	Negligible	Negligible	Moderate	Other traditional and cultural interests: Moderate
Tsleil-Waututh Nation	Minor	Negligible	Negligible	Minor-to-moderate	Other traditional and cultural interests: Minor-to-moderate

Note: * Impacts to cultural continuity and sense of place and identity were assessed in Part C of the Assessment Report, as requested by Musqueam Indian Band.

There are a range of factors that contributed to a greater assessed impact on some Indigenous groups' Aboriginal Interests, including a greater number or proportion of traditional use sites or areas that would be impacted by PBRP; identification of key sites or areas of importance by the Indigenous group that would be impacted by PBRP; and ways in which PBRP could impact cultural or experiential aspects for an Indigenous group. Impacts to Aboriginal Interests are anticipated to be mostly temporary in nature, occurring during construction and demolition, and would cease once these activities conclude. However, the construction of the new bridge would increase the risk of disturbance or loss of heritage and archaeological resources at *Qiqéyt*. The greatest assessed impacts to Aboriginal Interests would be impacts to other traditional and cultural interests, which would be moderate. The EAO recognizes the cultural and spiritual connection to the *Qiqéyt* site, and that PBRP-related effects to the site could also impact Indigenous groups' traditional and cultural interests.

The EAO received separate submissions from Musqueam Indian Band and Tsleil-Waututh Nation prior to referral to Ministers. Musqueam's separate submission outlined their outstanding concerns, proposed conditions, as well as additional comments on Part C of the Assessment Report. The EAO responded to Musqueam on March 22, 2019 indicating that all requested changes were made to Part C, that some additional changes to the proposed TOC and CPD in response to their submission, and also provided detailed responses to other concerns raised. The EAO also met with Musqueam via teleconference on March 28, 2019 to discuss the EAO's responses to the submission, and as a result of this call, the EAO made an additional edit to the proposed conditions. On April 1, 2019, Musqueam provided a supplemental submission to Ministers. The EAO responded on April 3, 2019 that confirmed an additional revision to the CPD was made that was responsive to the concern raised.

Tsleil-Waututh Nation's separate submission outlined outstanding concerns related to cumulative effects, potential impacts to fish and archaeological and heritage resources, and effectiveness of mitigation measures. The EAO provided a response to Tsleil-Waututh Nation on April 1, 2019, that outlined specific changes that had been made to the TOC and CPD during the EA to address concerns raised by

Tsleil-Waututh Nation regarding archaeological and heritage resources and fish and fish habitat. The EAO also outlined that each management plan would be required to include an evaluation of mitigation effectiveness, as well as an adaptive management plan, developed in consultation with Tsleil-Waututh Nation.

A detailed summary of the concerns raised in the separate submissions, as well as the EAO's responses, are included in Part C of the Assessment Report.

7 PUBLIC CONSULTATION

Public consultation requirements are intended to provide multiple, meaningful opportunities for the public to provide input into the EA process. MOTI was required to prepare a public consultation plan early in the EA that set out MOTI's consultation objectives and activities.

SUMMARY OF CONSULTATION ACTIVITIES LED BY MOTI

Beginning in June 2013, TransLink, along with New Westminster and Surrey, formally engaged the public and stakeholders on options for the bridge. TransLink submitted the first Public Consultation Report to the EAO during the Pre-Application Stage. Details of Translink's public consultation activities are described in Section 4 of the Assessment Report. MOTI conducted public consultation in two phases, described and summarized below:

Beginning in June 2013, TransLink, New Westminster and Surrey jointly led a consultation program, with the participation of Metro Vancouver, and met with residents and businesses, local and regional stakeholders, and bridge users about the initial options for rehabilitating or replacing the bridge. This included holding several open houses and small group meetings in New Westminster and Surrey. In July 2016, TransLink held several more open houses and small group meetings in New Westminster and Surrey, as part of broader community and public consultation, to better inform project development. Approximately 2,200 people participated in the various community meetings.

MOTI submitted the second Public Consultation Report to the EAO with the Application, and their final report near the end of Application Review. In February 2018, MOTI launched a new project website for the PBRP at <https://engage.gov.bc.ca/pattullobridge/>. Detailed descriptions of stakeholders with whom MOTI consulted and associated consultation activities are detailed in Section 4 of the Assessment Report. MOTI's Public Consultation Plan, the Application review public consultation reports are posted on the EAO's [EPIC website](#). MOTI responded to public comments obtained through the public comment periods, which were posted on the EAO's EPIC website.

SUMMARY OF CONSULTATION ACTIVITIES LED BY EAO

During the pre-Application phase, the EAO and the VFPA jointly held one 30-day public comment period,

from June 26 - July 26, 2017, on MOTI's draft VC document. The draft VC document described how key areas of studies were selected for assessment. The EAO and VFPA jointly held open houses in New Westminster on June 26, 2017 (15 attendees) and Surrey on June 27, 2017 (23 attendees). A total of 21 comments were received from the public.

During the Application Review phase, the EAO and VFPA jointly held a 30-day public comment period, from September 6, 2018 to October 9, 2018, on the Application. The EAO and VFPA jointly held open houses in Surrey on September 18, 2018 (18 attendees) and New Westminster on September 19, 2018 (65 attendees). A total of 13 comments were received from the public.

The EAO also held a final public comment period on a draft of its Decision Materials, commencing on February 19, 2019 for 30 days, prior to referral to Ministers. 15 comments were received from the public which were related to cycling safety and infrastructure.

Below is a summary of the key issues or themes raised by the public during the EA:

- Potential traffic impacts to the existing roadways on the New Westminster and Surrey sides;
- Land use planning and ensuring that the new bridge will be consistent with community plans in New Westminster and Surrey;
- Consideration of safety for cyclists and pedestrian traffic in bridge design including measures to protect users from cross winds; flashing and flicker affects from the suicide prevention barriers;
- The current scope of the new bridge proposed by MOTI has reduced cycling connections on the Surrey side compared to what was initially proposed by TransLink; and
- Potential noise and air quality effects from car and truck traffic and the need for a transparent protection barrier between the roadway and multi-use bridge paths.

The EAO has provided further detail of the public consultation activities in Section 4.5 of the Assessment Report. Public comments and MOTI's responses were considered and discussed further in the relevant sections of the Assessment Report. Key issues raised by the public helped inform the EAO's assessment of PBRP, including requests for technical information during the EA, the completion of the EAO's Summary Report and Assessment Report, and the development of the EAO's proposed Table of Conditions.

8 LOCAL GOVERNMENT AND HEALTH AUTHORITY CONSULTATION

The EAO invited Surrey, New Westminster, Metro Vancouver Regional District and the Fraser Health Authority to participate in the Working Group. All three local government agencies and the Health Authority actively participated in the Working Group and their input was reviewed and considered during the EA. The key concerns raised were the need for a pre-construction survey for rare plants, ensuring that impacts to standing heritage resources are minimized, concerns about the air quality modelling

assessment, and concerns about physical determinants of human health as well as social-community issues associated with PBRP.

The EAO was of the view that the concerns raised have been adequately resolved for the purposes of the EA. This information and key concerns are discussed in more detail in Sections 9 and 14 of the Assessment Report.

The EAO has considered the concerns of and potential effects to local governments and concerns raised by the Health Authority on human health and potential community effects during the EA and these concerns are discussed further in the relevant sections of the Assessment Report. Key issues raised by the local governments and the Health Authority helped inform the EAO's assessment of PBRP, including requests for technical information during the EA, the completion of the EAO's Summary and Assessment Reports, and the development of the EAO's proposed TOC.

9 ADDITIONAL CONSIDERATIONS

Ministers may consider other matters that are relevant to the public interest in making their decision in whether to grant an EAC to a proponent. The following potential economic benefits, contributions to community development and Indigenous employment benefits of the PBRP were presented in MOTI's Application and the EAO's Assessment Report and considered during the Application Review period.

ECONOMIC BENEFITS

According to MOTI, economic benefits would be derived from PBRP construction expenditures of approximately \$1.1 billion (2017 dollars) net of financing and property acquisition costs, and a construction period of six years (five years to design and build, and one year to demolish the existing bridge). PBRP would generate economic benefits through direct expenditures on goods and services, creation of employment opportunities and generation of tax revenues for local, provincial and federal governments. Construction is expected to provide \$208.6 million in tax revenue, including direct construction revenues of \$103.8 million accruing to the federal government, \$90.2 million to the provincial government and \$14.6 million to municipal taxes.

MOTI estimates that planning and construction expenditures for PBRP would result in direct employment benefits of more than 3,935 direct person years (PY) of employment. Indirect employment benefits would account for more than 3,460 PYs in businesses that support and supply the direct construction activities. Most construction jobs are expected to be filled from within BC, as has been the case with other Lower Mainland transportation projects in recent years.

CONTRIBUTION TO COMMUNITY DEVELOPMENT

The PBRP would be one of the first infrastructure projects in BC to be delivered under the new provincial

Community Benefits Agreement, administered and managed by the newly created BC Infrastructure Benefits Inc. (BCIB). Under the Community Benefits Agreement, BCIB will prioritize the hiring of local workers and employment opportunities including hiring of under-represented groups such as women, Indigenous people and people with disabilities.

The PBRP would represent a significant infrastructure upgrade, replacing a potentially dangerous, expensive to maintain, and degrading public roadway. The new four-lane bridge would meet current seismic and road design standards, and provide a safe and reliable crossing for vehicles, pedestrians and cyclists, network connections in Surrey and New Westminster, and the removal of the existing bridge which is in a state repair and perpetual maintenance.

The existing Pattullo Bridge is in a central location that makes it a vital link the communities and the goods and services which flow across the Fraser River. The bridge is part of the regional transportation network for people, goods, and services connecting Surrey and New Westminster. Opened in 1937, it is one of the oldest bridges in Metro Vancouver and currently does not comply with modern design standards which represent multiple risks. These risks include damage from a moderate earthquake, ship collision, or high wind event. Pattullo Bridge piers are at risk of being undermined by river scour, and many critical components have surpassed their design service life. Existing facilities, such as sidewalks, barriers, and connections for pedestrians and cyclists, do not currently provide the same level of protection from traffic as a new bridge that incorporates these designs would.

According to the Application, the PBRP goals and objectives include providing a structurally sound bridge crossing, maintaining a critical regional connection which improves safety for all users with a variety of modalities while supporting environmental objectives. These goals and objectives would be achieved by building a safer crossing with modern lane widths which accommodates standard passenger and commercial vehicles separated by a centre median that adds improved safety. Dedicated cycling facilities, isolated from bridge traffic would be designed and built adding to the improvement of network connections to New Westminster and Surrey.

BENEFITS TO AFFECTED INDIGENOUS COMMUNITIES

In addition to offering capacity funding to support consultation activities, MOTI has indicated that PBRP 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 PBRP, including opportunities related to employment, training and contracting.

The EAO is also aware that MOTI and Indigenous groups are in discussions regarding relationship agreements and that could help to mitigate the impact of the PBRP on economic interests, and that MOTI is committed to entering into Mutual Benefit Agreements with all interested Indigenous groups on aspects including, but not limited to contracting, employment and training opportunities.

10 CONCLUSIONS

Based on:

- Information contained in MOTI's Application and supplemental information provided during the Application review;
- MOTI and the EAO's efforts at consultation with Indigenous groups, provincial, and local government agencies, and the public and MOTI's commitment to ongoing consultation;
- Comments on the PBRP made by Indigenous groups, and provincial and local government agencies and the Fraser Health Authority as members of the EAO's Working Group, and MOTI and the EAO's responses to those comments;
- Comments on the PBRP received during the public comment period, and MOTI's response to these issues;
- Issues raised by Indigenous groups regarding the potential impacts of the PBRP to their Aboriginal Interests and MOTI's response and best effort to address these issues;
- Issues raised by Indigenous groups that were outside of the scope of the PBRP EA and the Province and MOTI's approaches to address these issues;
- The design of PBRP as specified in the EAO's proposed Schedule A (Certified Project Description) of the EAC to be implemented by MOTI during all phases of the PBRP; and
- Mitigation measures identified as proposed conditions in the EAO's proposed Schedule B (Table of Conditions) of the EAC to be undertaken by MOTI during all phases of the PBRP.

The EAO is satisfied that:

- The EA process has adequately identified and assessed potential adverse environmental, economic, social, heritage and health effects of the PBRP, having regard to the proposed conditions set out in Schedule B (Table of Conditions) to the EAC, if issued;
- Consultation with Indigenous groups government agencies and the public has been adequately carried out and that efforts to consult with Indigenous groups will continue on an ongoing basis;
- Issues identified by Indigenous groups, government agencies, the Fraser Health Authority and members of the public, which were within the scope of the EA, were adequately and reasonably addressed during Application Review;

EAO

- Practical means have been identified to prevent or reduce any potential adverse environmental, social, economic, heritage or health effects of the PBRP such that no direct or indirect significant adverse effect is predicted or expected; and
- The potential for adverse impacts to the asserted Aboriginal Interests of Indigenous groups have been avoided, minimized or otherwise accommodated to an acceptable level.

APPENDIX A: SUMMARY CHARACTERIZATION OF RESIDUAL ADVERSE EFFECTS

Valued Components	Residual Effects	Context (Resilience)	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Likelihood	Confidence	Significance	Section of Assessment Report	Proposed EA Certificate Conditions ³
1. Fish and Fish Habitat	Changes to aquatic and riparian habitat due to project footprint disturbance	Low to Moderate sensitivity	Low	Project area	Long-term	Single	Irreversible	High	High	Not Significant	5.0	12
	Physical injury, mortality or behavioral changes to fish due to underwater noise exposure	Low to High	Moderate	Beyond Regional	Short-term to Long-term	Regular during Construction Phase	Reversible	Moderate	Moderate	Not Significant	5.0	11
2. Fraser River Hydraulics and Morphology	Change in river bed levels	Moderate resilience	Moderate	Local - regional	Long-term	Frequent/Regular	Irreversible	High	High	Assessment carried forward to receptor VC per AIR	6.0	18
3. Surface Water and Sediment Quality	No adverse residual effects											
4. Soil and Groundwater Quality	No adverse residual effects											
5. Vegetation	No adverse residual effects											
6. Wildlife	No adverse residual effects											
7. Marine Use	Disruption in use of the navigation channel	Moderate sensitivity	Low	Local	Short-term	Infrequent	Reversible	Moderate	Moderate	Not Significant	11.0	10, 11, 14
8. Land Use	No adverse residual effects											

Valued Components	Residual Effects	Context (Resilience)	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Likelihood	Confidence	Significance	Section of Assessment Report	Proposed EA Certificate Conditions
9. Visual Quality	Change in visual quality	High resilience	Low	Local	Long-term	Continuous	Irreversible	High	High	Assessment carried forward to receptor VC per AIR	13.0	8, 9, 17
10. Heritage Resources	Disturbance or loss of heritage resources	Moderate sensitivity	Moderate	Site-specific	Permanent	Frequent	Irreversible	High	Low - Moderate	Not Significant	14.0	16, 17, 19, 20, 21, 22
	Disturbance to archaeological sites along shoreline of the Fraser River	Moderate sensitivity	Low - moderate	Site-specific	Permanent	Frequent	Irreversible	High	Low - Moderate	Not Significant	14.0	16, 17, 19, 20, 21, 22
11. Physical Determinants of Human Health	No adverse residual effects											
12. Air Quality	Changes to ambient air quality during construction and demolition	Moderate resilience	Negligible - Low	Project area - Local	Short-term	Frequent to Continuous	Reversible	High	High	Assessment carried forward to receptor VC per AIR	16.0	8, 9
13. Noise and Vibration	Increased noise during construction	Moderate resilience	Negligible - Low	Local	Short-term to Long-term	Infrequent – Frequent/ Regular	Reversible	Low - High	Moderate	Assessment carried forward to receptor VC per AIR	17.0	8, 9, 11, 13
	Increased vibration during construction	Low – Moderate resilience	Low - Moderate	Local	Short-term to Long-term	Infrequent – Frequent/ Regular	Reversible	Low - High	Moderate	Assessment carried forward to receptor VC per AIR	17.0	8, 9, 11, 13
14. Socio-Community	No adverse residual effects											
15. Economic Activity	No adverse residual effects											

APPENDIX B: SUMMARY OF KEY ISSUES RAISED BY INDIGENOUS GROUPS AND THE EAO'S RESPONSES

Key concern	EAO response	Proposed Conditions and Mitigations
Project Impacts		
<p>Fish and Fish Habitat Impacts</p> <p>Indigenous Groups raised concerns about potential impacts to fish and fish habitat due to alteration of habitat, changes to the river bed, changes to water flow, overlap of the PBRP with key fishing areas.</p> <p>Indigenous Groups identified the Pattullo Bridge area as a key fishing location, due to several rare environmental attributes that together establish critical habitat and harvesting conditions for valued species such as salmon and eulachon.</p>	<p>The PBRP would result in residual effects on fish and fish habitat, including changes to aquatic and riparian habitat due to project footprint disturbance. These effects would initially occur during construction of the PBRP and the effect on habitat loss would be irreversible.</p> <p>Construction of the PBRP would take approximately 44 months to complete and be followed by demolition of the current bridge over a period of 18 months. Both construction and demolition would involve instream works and the EAO concludes that there would be adverse residual effects on fish and fish habitat, marine use, visual quality and noise and vibration (sections 5, 11, 13 and 17 of the Assessment Report) which could impact Indigenous Groups' right to fish.</p> <p>Physical injury, mortality or behavioral changes to fish could occur due to an increased exposure to underwater noise during construction and demolition. Mitigation measures, such as the use of a noise reduction system for pile driving, are expected to limit the noise levels that exceed mortality/potential mortal injury thresholds to a small localized area around the piles. On most fish populations, the duration of the effect is expected to be short-term. However, in the case of at-risk populations the effect could have long-term consequences.</p> <p>The EAO understands PBRP is expected to result in increases and decreases in flow velocities at various locations immediately upstream and downstream of PBRP which can result in changes to bed levels. Potential PBRP-related residual effects can potentially be mitigated through additional scour protection and refinements to pier positions and configuration during final design which may improve pier hydraulic performance. Future hydraulic modelling assessment of the detailed design for PBRP and proposed New Westminster Railway Bridge upgrades, can be used to compare with surveyed bed elevation changes to evaluate the accuracy of the original effects prediction and the</p>	<p>Condition 11 (Fish and Fish Habitat Monitoring and Mitigation Plan): Requires MOTI to: identify reduced-risk work windows and the work that would occur within, and outside, of these windows; monitor for fish presence during construction and demolition; identify measures to mitigate the impacts to fish and fish habitat; require the completion of the eulachon study prior to construction; and, incorporate Indigenous traditional knowledge in the design of the above activities.</p> <p>Condition 12 (Fish and Wildlife Habitat Offsetting Plan): Requires MOTI to develop a plan for offsetting the loss of fish habitat from PBRP. The plan would be developed in consultation with Indigenous groups and would: identify proposed fisheries offsets; include a monitoring program to assess and evaluate the effectiveness of offsetting measures; and, incorporate Indigenous traditional knowledge in the design of the above activities.</p> <p>Condition 13 (Marine and Fisheries Access Management Plan): Requires MOTI to complete supplemental hydraulic modeling based on the detailed design of in-river components of the Project, including predicted Project-related changes in scour and sediment deposition, flow velocities and flow distribution in the Fraser River, and mitigation measures proposed to address potential adverse effects predicted by the modelling. MOTI's plan must also identify the locations at and</p>

Key concern	EAO response	Proposed Conditions and Mitigations
	effectiveness of proposed mitigation measures.	frequency with which river bed and foreshore monitoring will be conducted.
Restoration, Offsetting and Net Environmental Gain Indigenous Groups requested that the project result in a net environmental gain, especially in relation to fish, wildlife, vegetation and habitat restoration.	<p>The EAO found effects on fish and fish habitat, and proposed conditions to offset the lost habitat. Based on feedback from Indigenous groups, and because the demolition would require restoration of the current bridge's footprint the EAO proposed a condition to include wildlife habitat restoration, despite the lack of residual effects on wildlife. The CEMP also includes restoration and enhancement to vegetation.</p> <p>The EAO concludes that PBRP would have negligible adverse effects on vegetation and there are no wetland ecosystems or natural (at-risk) ecosystems in the LSA. Based on feedback from Indigenous Groups, the CEMP and DEMP conditions require that MOTI include vegetation restoration and enhancement, including a focus on the restoration of species that are of cultural importance to Indigenous Groups.</p> <p>The EAO is also aware of MOT's commitment to Aboriginal Groups to use a collaborative approach to offsetting, which includes ensuring Indigenous input into offsetting options.</p>	<p>Condition 9 and 10 (Construction Environmental Management Plan and Demolition Environmental Management Plan): Require the development of a component plan that includes vegetation and invasive species management. This condition would require MOTI to develop a revegetation plans to restore and enhance the potential of permeable surfaces of the site to function effectively as fish, wildlife, and migratory bird habitats. This plan would be developed in consultation with Indigenous groups.</p> <p>Condition 12 (Fish and Wildlife Habitat Offsetting Plan): Requires MOTI to identify reduced-risk work windows and the work that would occur within, and outside, of these windows; monitor for fish presence during construction and demolition; identify measures to mitigate the impacts to fish and fish habitat; require the completion of the eulachon study prior to construction; and, incorporate Indigenous traditional knowledge in the design of the above activities. This plan would be developed in consultation with Indigenous groups.</p>
Impacts to Fishing and Marine Access Indigenous groups expressed concern that construction and demolition activities could impact or disrupt Indigenous fishery	<p>The PBRP footprint intersects with a preferred fishing area for Indigenous groups. The area is important due to environmental attributes that together establish critical habitat and harvesting conditions for valued species such as salmon, sturgeon and eulachon.</p> <p>The PBRP would directly and indirectly affect marine use by disrupting navigation and navigability through temporary restrictions in the main and secondary navigation channels which could lead to increased transit times during construction and demolition. The in-river construction and demolition work could lead to marine users having to avoid temporary construction zones set up around PBRP and the Pattullo Bridge activities,</p>	<p>Condition 13 (Marine and Fisheries Access Management Plan): Requires MOTI to describe the measures to avoid, minimize or mitigate disruptions for members of Indigenous Groups, identification of travel corridors for PBRP-related vessels, as well as existing and traditional navigation routes, fishing areas, habitat areas, and any associated timing windows, including those identified and communicated by Indigenous Groups.</p>

Key concern	EAO response	Proposed Conditions and Mitigations
<p>openings and marine navigation.</p>	<p>which could result in vessel speed reductions through these zones and a change of course. The potential impacts to navigation and navigability would be temporary in nature depending on the construction activity, and the activities that would take place in the marine construction zones, such as the installation of new piers in the river, are short-term events.</p> <p>The new piers could change how Indigenous groups fish in this area, which has the potential to adversely impact Indigenous Group's ability or experience of fishing in this specific area. This in turn, could lead to cultural, social and economic impacts tied to an Indigenous group's right to fish, as well as economic impacts to Indigenous groups engaging in commercial fishing.</p> <p>The PBRP is not anticipated to result in any new access restrictions for fishing once construction and demolition are complete, as the new bridge will have fewer in-river piers compared to the existing Pattullo Bridge.</p>	
<p>Protection of archaeological and heritage resources</p> <p>Indigenous groups raised concerns regarding potential effects on heritage resources, the Qiqeyt village site and ancestral remains.</p> <p>Qiqeyt Village Site: Impacts to cultural interests</p> <p>Indigenous groups raised</p>	<p>The EAO concluded that there would be an increased risk of disturbance to or loss of heritage resources, including ancestral remains, due to construction and demolition activities. Even though MOTI's supplemental hydraulic modelling memo suggests that sediment deposition and/or erosion at sites along the foreshore of the river caused by changes in morphology pose low to no risk to archaeological sites in the area, the EAO still concludes that localized shoreline or bank erosion during the addition and removal of bridge piers could increase the risk of disturbance to archaeological sites along the shorelines of the Fraser River.</p> <p>The EAO recognizes the importance of the Qiqeyt to several Indigenous Groups. PBRP is in an area with a long history of human habitation and high archaeological value. There are many buried heritage resource sites with evidence of extensive disturbance and there is high potential for other disturbed and undisturbed archaeological deposits to be encountered within the LSA.</p> <p>Indigenous Groups reported on the past use and current condition of the area, noting</p>	<p>Condition 13 (Marine and Fisheries Access Management Plan): Requires MOTI to complete supplemental hydraulic modeling based on the detailed design of in-river components of the Project, including predicted changes in scour and sediment deposition, flow velocities and flow distribution in the Fraser River, and propose mitigation measures address potential adverse effects predicted by the modelling.</p> <p>Condition 15 (Cultural and Archaeological Resources Management Plan): Requires MOTI to complete additional Archaeological Impact Assessment work prior to construction and to develop and implement an ancestral remains protocol in the event ancestral remains are encountered. This plan would be developed in consultation with Indigenous groups.</p> <p>Condition 8 (Involvement of Indigenous groups in</p>

Key concern	EAO response	Proposed Conditions and Mitigations
<p>concerns regarding potential impacts to the historical village of <i>q' aq' ayt</i>.</p>	<p>the extensive changes to the landscape and development that has occurred without consultation in the past.</p>	<p>construction and demolition monitoring): Requires MOTI to develop the terms of engagement for Indigenous monitors in consultation with Indigenous Groups. Indigenous monitors would participate in the monitoring of construction and demolition focused on the areas of interest to the Indigenous Groups they are representing.</p> <p>Mitigations: MOTI would be required to obtain permits under the <i>Heritage Conservation Act</i> which authorizes the alteration of an archaeological site once investigations are complete, so construction can proceed.</p> <p>Condition 16 (Indigenous Cultural Recognition Plan): In consultation with Indigenous groups, this condition requires MOTI to recognize and commemorate heritage sites, and describe the process to identify, explore and plan for PBRP-related opportunities for cultural awareness, education, interpretation and commemoration.</p> <p>Certified Project Description: Limits the extent of the bridge construction both in-river and on land. The in-river piers are limited to a total of four, and the land-based piers are restricted to no more than nine within a defined area on the Surrey side of the river.</p>
<p>Reference Concept, worst-case scenario, and number of bridge piers</p> <p>Indigenous Groups raised concerns that there is uncertainty with predicting</p>	<p>The EAO agrees with MOTI's approach of assessing the effects using a "worst-case scenario" for the valued components considered in the environmental assessment (EA). This involved assessing the greatest amount of potential impact on a valued component possible from PBRP, including considering there being up to four piers in the water, even though the contractor awarded PBRP may have a final design that has fewer in-river piers. For the Fish and Fish Habitat VC, the worst-case scenario considered all valued component sub-component fish to be present in the PBRP area, even though some fish</p>	<p>Condition 16 (Indigenous Cultural Recognition Plan) Requires that the plan describe opportunities made available to Indigenous Groups to review and provide comment on Project design, and documentation of how feedback received, or comments raised by Indigenous Groups were considered.</p> <p>Certified Project Description: Limits the extent of the bridge</p>

Key concern	EAO response	Proposed Conditions and Mitigations
potential effects, or worst case scenario, as the EA was conducted on a project Reference Concept, rather than on the contractor's final design that has not yet been determined. Indigenous Groups also raised concerns about the number of in-river and land-based piers.	may only be present in the area for a short period of time during migration. The EAO has proposed conditions and constraints within the conditions and certified project description to ensure that the final bridge design does reflect less potential effects than the worst-case scenario predicted. The certified project description places a limit on the location and number of water- and land-based piers. In the case of the land-based piers, the certified project description is more restrictive than was proposed in the Application and in the Reference Concept.	construction within the river and on land. The in-river piers are limited to a total of four, and the land-based piers are restricted to no more than nine within a defined area. In addition, the CPD excludes the use of barge landing sites within areas that Indigenous groups have noted are culturally and ecologically important.
Potential Project Benefits		
Procurement and Employment Aboriginal Groups have expressed an interest in procurement, contracting and employment opportunities with PBRP	The EAO is aware that MOTI is actively engaged in negotiating benefit agreements with all 14 Indigenous groups, many of which include discussions related to contracting and employment opportunities. MOTI has also noted that they intend to hold an Indigenous Business to Business session to allow for networking between Indigenous businesses/partnerships and the shortlisted bid team.	Condition 8 (Involvement of Indigenous groups in construction and demolition monitoring): Requires MOTI to provide monitoring opportunities for Indigenous groups during construction and demolition. Condition 17 (Indigenous Training, Employment and Procurement Plan): Requires MOTI to develop a plan for communicating training, employment and procurement opportunities; measures to provide training opportunities for Indigenous monitors and enhance the hiring and retention of Indigenous Groups and their members; and measures to support the procurement of goods and services from businesses owned by Indigenous Groups.
EA Methodology		
Cumulative Effects	MOTI was required to assess the effects of the Project based on the current existing ecological condition. The EAO's methodology requires the assessment of cumulative	Condition 2 (Plan Development): No condition proposed

Key concern	EAO response	Proposed Conditions and Mitigations
Indigenous groups expressed that a more effective approach to a cumulative effects assessment is to begin at pre-contact and then assess the cumulative impacts to the area to the current time including reasonably foreseeable projects and that they supported a more holistic approach, rather than being based on valued component residual effects.	<p>effects if residual adverse effects are identified that could interact with residual effects of other past, present or reasonably foreseeable projects and activities based on the current ecological baseline.</p> <p>The EAO also considered potential cumulative adverse effects to Aboriginal Interests, by understanding effects of a project on factors that are important for the exercise of a right. This includes the cumulative impacts on biophysical IC and VCs such as impacts on water, wildlife populations, impacts on specific sites of traditional use, and a consideration of the cumulative impacts of a project on the social, cultural, spiritual and experiential aspects of the Aboriginal right. If the current ability to practice an Aboriginal right is already constrained due to factors such as previous developments, the conclusion on effects from a current project on that right would be more serious. Likewise, if the ability to practice an Aboriginal right is expected to be constrained further by the potential effects of other reasonably foreseeable projects and activities that overlap with the effects of the project, the conclusion on the effects from the project on that right would be more serious. Conclusions regarding the impacts on Aboriginal rights are made after considering mitigation and accommodation measures required by the EAO to address potential impacts.</p>	