

# Viterra Cascadia Terminal Track Expansion Phase 4 – Aquatic Effects Assessment

**Prepared for:**

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Project No. 104703-01

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## EXECUTIVE SUMMARY

The Canadian Pacific Railway Company (CP) is proposing to construct Phase 4 of the Viterra-Cascadia Terminal Capacity Expansion Project (Project) along the south shore of Burrard Inlet in Burnaby, British Columbia. The Project will require reconfiguration of the existing tracks, construction of an additional 1,500 metres of new track, and construction of a new control point.

CP retained Hemmera Envirochem Inc. (Hemmera) to:

- Conduct an Aquatic Effects Assessment
- Determine whether the Project will result in the death of fish or in harmful alteration, disruption, or destruction to fish habitat and thus require a *Fisheries Act* Authorization (FAA) under section 35(2)(b) of the *Fisheries Act*, RSC 1985, c. F-14.

The Project is located on the south shore of Burrard Inlet, seaward of the existing CP Cascade mainline. To evaluate Project effects, a literature review was used to characterize the baseline biophysical conditions within the Project area. Documents reviewed comprised relevant Project reports, action plans, management programs, and federal and provincial databases, along with field surveys completed in 2020.

The results of the literature review indicated that the backshore of the Project area included Confederation and Montrose municipal parks and the Chevron Parkland Refinery. Seaward of the rail grade, the topography ranged from steep at the western end of the Project area, to shallow at the eastern end. Below a riprap slope supporting the railway grade, substrates were characteristic of natural shorelines typical of Burrard Inlet and consisted of a mix of bedrock, cobble, gravel, and sand. A small rocky reef was located in the low intertidal zone in the eastern half of the Project area. The shallow subtidal zone was composed of sand and gravel with small areas of bedrock, boulders, and cobbles, transitioning to softer sediments, primarily sand in the deeper subtidal.

The Project has the potential to result in the death of fish or in harmful alteration, disruption, or destruction to fish habitat through the following Project activities:

- The use of industrial equipment
- Vegetation clearing
- Grading
- Placement of materials and structures in water.

These activities have the potential to affect fish and fish habitat through the following pathways:

- Change in sediment concentrations
- Change in contaminant concentrations
- Change in habitat structure and function
- Mortality of fish.

Measures to avoid and mitigate the potential effects on fish and fish habitat described above were considered for the Project and are not expected to break all of the relevant pathways of effects. It is expected that some works, undertakings, and activities required by the Project will result in **18,545 m<sup>2</sup>** of alteration and **11,314 m<sup>2</sup>** of destruction to fish habitat. Therefore, an FAA under section 35(2)(b) of the *Fisheries Act* will be required.

This work was performed in accordance with the Purchase Order #4200020070 between Hemmera Envirochem Inc. (Hemmera), a wholly owned subsidiary of Ausenco Engineering Canada Inc. (Ausenco), and Canadian Pacific Railway Company (Client), dated February 11, 2020 (Contract). This report has been prepared by Hemmera, based on fieldwork conducted by Hemmera in 2020, for sole benefit and use by Canadian Pacific Railway Company. In performing this work, Hemmera has relied in good faith on information provided by others and has assumed that the information provided by those individuals is both complete and accurate. This work was performed to current industry standard practice for similar environmental work, within the relevant jurisdiction and same locale. The findings presented herein should be considered within the context of the scope of work and Project terms of reference; further, the findings are time sensitive and are considered valid only at the time the report was produced. The conclusions and recommendations contained in this report are based upon the applicable guidelines, regulations, and legislation existing at the time the report was produced; any changes in the regulatory regime may alter the conclusions and/or recommendations.

This Executive Summary is not intended to be a stand-alone document, but a summary of findings as described in the following Report. It is intended to be used in conjunction with the scope of services and limitations described therein.

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## LIST OF ACRONYMS AND ABBREVIATIONS

Acronym / Abbreviation	Definition
AEA	Aquatic Effects Assessment
Ausenco	Ausenco Engineering Canada Inc.
BC	British Columbia
BMP	best management practice
CD	chart datum
CMC	corrugated metal culvert
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CP	Canadian Pacific Railway Company
DC	dust control
DFO	Fisheries and Oceans Canada
EA	Environmental Assessment
EM	Environmental Monitor
ENV	British Columbia Ministry of Environment and Climate Change Strategy
FAA	<i>Fisheries Act</i> Authorization
FREMP	Fraser River Estuary Management Program
GIS	geographic information system
GPS	geographic positioning system
HADD	harmful alteration, disruption, or destruction
Hemmera	Hemmera Envirochem Inc.
HHWLT	higher high-water large tide
HWL	high-water line
LLWLT	lower low-water large tide
LWL	low-water line
MMO	Marine Mammal Observer
PER	Project and Environmental Review
POEs	pathways of effects
Project	Viterra-Cascadia Terminal Capacity Expansion Project
QEP	Qualified Environmental Professional
RCA	rockfish conservation area
SARA	<i>Species at Risk Act</i>
SCUBA	self-contained underwater breathing apparatus
SEC	sediment and erosion control
SPR	spill prevention and response
Port Authority	Vancouver Fraser Port Authority
WQM	water quality management

## LIST OF SYMBOLS AND UNITS OF MEASURE

Symbol / Unit of Measure	Definition
<	less than
>	greater than
%	percent
°C	degrees Celsius
cm	centimetre
km	kilometre
m	metre
m <sup>2</sup>	square metre

## 1.0 INTRODUCTION

As part of the Vancouver Fraser Port Authority (Port Authority) Burrard Inlet Road and Rail Improvement and Gateway 2030 Projects, the Canadian Pacific Railway Company (CP) is planning for Phase 4 of the Viterra-Cascadia Terminal Capacity Expansion Project (Project) along the south shore of Burrard Inlet, east of the Second Narrows Bridge in Burnaby, British Columbia (BC) (**Figures 1a** and **1b**). As part of the expansion activities for Phase 4, CP is proposing to construct 1,500 metres (m) of new track between CP Mile 122.93 and 124.96.

Phase 4 will require approval from the Port Authority through their Project and Environmental Review (PER) process, as well as a lease with the Port Authority for the expanded track within their jurisdiction. Additionally, Phase 4 will require an Authorization pursuant to paragraph 35(2)(b) of the federal *Fisheries Act*, RSC 1985, c. F-14.

In support of these environmental approval processes, Hemmera Envirochem Inc. (Hemmera) has developed this Aquatic Effects Assessment (AEA). This AEA:

- Summarizes the technical studies that were completed in 2020
- Provides qualitative and quantitative habitat and species information for the Project area
- Assesses the potential effects on fish and fish habitat from construction of the Project
- Describes measures to avoid or mitigate the potential effects
- Determines the likelihood of residual effects following construction of the Project, in support of permitting requirements pursuant to the federal *Fisheries Act*.

This work was performed in accordance with a Supply of Services Agreement between Hemmera Envirochem Inc. (Hemmera), a wholly owned subsidiary of Ausenco Engineering Canada Inc. (Ausenco), and Canadian Pacific Railway Company (Client), dated May 24, 2017 (Contract). This report has been prepared by Hemmera, based on fieldwork conducted by Hemmera, for sole benefit and use by Canadian Pacific Railway Company. In performing this work, Hemmera has relied in good faith on information provided by others and has assumed that the information provided by those individuals is both complete and accurate. This work was performed to current industry standard practice for similar environmental work, within the relevant jurisdiction and same locale. The findings presented herein should be considered within the context of the scope of work and Project terms of reference; further, the findings are time sensitive and are considered valid only at the time the report was produced. The conclusions and recommendations contained in this report are based upon the applicable guidelines, regulations, and legislation existing at the time the report was produced; any changes in the regulatory regime may alter the conclusions and/or recommendations.

## 1.1 Proponent Contact Information

### 1.1.1 Proponent

#### Contact Information:

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### 1.1.3 Contractor

TBD

### 1.1.4 Environmental Consultant

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## 1.2 Regulatory Context

The *Fisheries Act* is the main federal law governing fish, fish habitat, and fisheries in Canada. The purpose of the Act (section 2.1) is to provide a framework for:

- (a) The proper management and control of fisheries; and
- (b) The conservation and protection of fish and fish habitat, including by preventing pollution.

Fish, as defined by the *Fisheries Act* under subsection 2(1) includes:

- (a) Parts of fish
- (b) Shellfish, crustaceans, marine animals, and any parts of shellfish, crustaceans, or marine animals; and
- (c) The eggs, sperm, spawn, larvae, spat and juvenile stages of fish, shellfish, crustaceans, and marine animals.

Fish habitat, as defined by the *Fisheries Act* under subsection 2(1), is:

*“Water frequented by fish and any other areas on which fish depend directly or indirectly to carry out their life processes, including spawning grounds and nursery, rearing, food supply, and migration areas.”*

The Fish and Fish Habitat Protection and Pollution Prevention provisions of the Act include the following:

- A prohibition against causing the death of fish, by means other than fishing (section 34.4)
- A prohibition against causing the HADD of fish habitat (section 35). HADD is defined as any temporary or permanent change to fish habitat that directly or indirectly impairs the habitat's capacity to support one or more life processes of fish.

Subsections 34.4(2)(b) and 35(2)(b) qualify these prohibitions and allow for the authorization of a HADD to fish and fish habitat by the Minister of Fisheries and Oceans or a prescribed person or entity, if the work, undertaking, or activity is carried out in accordance with applicable regulations. Where death of fish is likely to result from a work, undertaking, or activity, it will be necessary to determine the relative contribution of the potentially affected fish and their habitat to the productivity of the relevant fisheries. In doing so it is necessary to consider issues such as which species are likely to be affected, at what stage of their life the effects may occur, and which life-cycle functions may be affected.

Fisheries and Oceans Canada's (DFOs) Fish and Fish Habitat Protection Policy Statement provides a framework for the conservation and protection of fish and fish habitat (Government of Canada 2019c). Proponents of a work, undertaking, or activity taking place in or near water that may harmfully affect fish or fish habitat are expected to:

- Understand the types of harmful effects their works, undertakings, or activities are likely to cause.
- Take measures to avoid harmful effects, including following relevant standards, codes of practice, or regulations.
- Request an exception (Authorization Concerning Fish and Fish Habitat Protection Regulations) to the section 34.4 and 35 prohibitions when it is not possible to avoid harmful effects on fish and fish habitat.

Project proponents must first seek to avoid (e.g., relocation, timing) and secondly mitigate works, undertakings, or activities that would result in the death of fish or a HADD of fish habitat before DFO will consider authorizing such works. If harmful effects on fish and fish habitat are unavoidable, and residual effects remain after mitigation measures are applied, then habitat creation, restoration, or enhancement may be accepted as offsetting measures for residual effects for a Project.

DFO will consider the following factors from section 34.1(1) of the Fish and Fish Habitat Protection Policy Statement (2019c) before issuing an Authorization under the fish and fish habitat protection provisions of the *Fisheries Act*:

- a) The contribution to the productivity of relevant fisheries by the fish or fish habitat that is likely to be affected
- b) Fisheries management objectives
- c) Whether there are measures and standards
  - (i) To avoid the death of fish or to mitigate the extent of their death or offset their death, or
  - (ii) To avoid, mitigate or offset the harmful alteration, disruption or destruction of fish habitat
- d) The cumulative effects of the carrying on of the work, undertaking or activity in combination with other works, undertakings or activities that have been or are being carried on, on fish and fish habitat
- e) Any fish habitat banks, as defined in section 42.01, that may be affected
- f) Whether any measures and standards to offset the harmful alteration, disruption or destruction of fish habitat give priority to the restoration of degraded fish habitat
- g) Indigenous knowledge of the Indigenous communities of Canada that has been provided to the Minister
- h) Any other factor that the Minister considers relevant.

### 1.2.1 Provincial and Municipal Legislation

Hemmera understands that CP will not be submitting an application for the Project or activity approval under the provincial or municipal permit requirements, since CP is a federally regulated entity pursuant to the *Canada Transportation Act*, S.C. 1996, c. 10. In addition, on the advice of CP's legal counsel, CP will not be applying for approval under section 7 of the BC *Water Users' Communities Act*, RSBC 1996, c. 483, for activities related to the maintenance or safety of a federal railway undertaking. CP remains committed to implementing the best management practices (BMPs) developed based on guidance provided by the Ministry and DFO.



## 2.0 PROJECT DESCRIPTION

### 2.1 Project Description and Location

The Project will support the Greater Vancouver Gateway 2030 program objectives of removing bottlenecks in the transportation network to help the Canadian economy continue to grow. The Project will allow for assembly of 8,500-ft trains clear of the mainline track and reduce delays for other trains serving freight and passengers in downtown Vancouver.

Phase 4 will require reconfiguration of existing tracks associated with the Chevron Parkland Refinery and construction of a new control point at Mile 123.00. The proposed track extension is located approximately 1,000 m east of the Second Narrows Bridge and would increase the length of the existing third track by approximately 1,500 m (**Figures 1a** and **1b**). Different options for the track expansion configuration are currently being analyzed on both the north and the south side of the existing CP track to develop the most cost-effective solution. To remain as conservative as possible, this AEA considers the Project design with the largest in-water footprint (**Figure 2**). The entire Project footprint (**Figure 2**) will be within the existing CP right-of-way or within the Port Authority lease area.

To extend the track, CP will need to widen the existing rail bed by placing clean, engineered fill into the riparian area and marine environment (intertidal and potentially subtidal habitat) in Burrard Inlet. Three approaches to construction are being considered: (1) water-based access using barges, (2) constructing a service road either on CP property or in the intertidal zone westward from the public crossing at Penzance Drive, and (3) constructing a new service road to access the track from the Chevron Parkland Refinery. Additionally, the Project will involve installation of rail switches to the east of the track extension. Construction is proposed to for September 2022.

The tidal range at this location is approximately 5 m from the lower low-water large tide (LLWLT) at 0 m chart datum (CD) and the higher high-water large tide (HHWLT) at +5 m CD, with a mean water level of +3 m CD. The intertidal zone (0 m to +5 m CD) is primarily rocky, transitioning up to a steep riprap embankment leading to approximately 5 m of patchy riparian vegetation that borders the gravel bed of the 2 existing active CP rail lines.

### 2.2 Project Components

Several components of the Project will be constructed within a single congruent footprint, seaward of the existing infrastructure:

- Reconfiguration of existing tracks
- Construction of new track extension
- Construction of facilities and control points associated with new track.

Construction activities and a proposed construction schedule are described below.

#### 2.2.1 Construction Activities

The following works, undertakings, and activities will be undertaken:

- Early works to establish access, equipment and material laydown areas, and site offices will include mobilization and processing of overburden materials

- Removal of vegetation (including riparian vegetation) along the construction corridor (i.e., clearing, grubbing, and stripping)
- Infilling below the HHWLT along the construction corridor to support rail sidings on the seaward side on the existing rail mainline
- Grading and sub-ballast construction of the construction corridor using machinery such as dozers, excavators, rollers, and compactors
- Shoreline protection works to stabilize filled sections of the shoreline
- Culvert installation and extension to maintain drainage to and from existing watercourses
- Track installation.

### 2.2.2 Construction Schedule

Project construction is scheduled to commence in September 2022. The overall construction schedule is estimated to take up to 18 months (**Table 2.1**). A detailed timeline of Project construction is provided in the accompanying Construction Environmental Management Plan (CEMP) and **Appendix B** of this AEA report.

**Table 2.1 Tentative Construction Schedule**

Task	Start	Finish
Environmental permitting	June 2020	July 2022
Detailed design and development permits	May 2020	April 2022
Grading	September 2022	March 2023
Track construction	February 2023	May 2023

### 2.3 Site History

The Project area has been occupied by Indigenous communities since time immemorial. CP acknowledges that member nations of the Cowichan Nation Alliance, Lyackson First Nation, Musqueam Indian Band, Kwikwetlem First Nation, Squamish Nation, Stó:lō Nation, Stó:lō Tribal Council, Tsleil-Waututh Nation, and Ts'uubaa-asatx Nation have historical and current overlapping interests within and around the Project area.

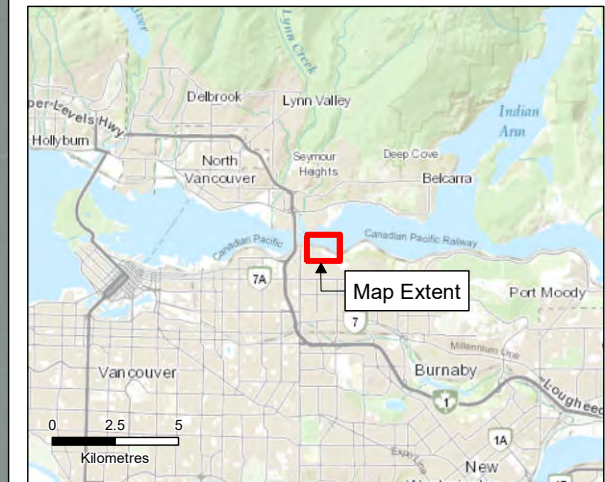
The existing site is believed to have been historically filled around 1886 when the CP rail line was constructed (Hemmera 2015). An oil refinery (currently the Parkland Refining Plant) is located within the Project footprint and has been operating since as early as 1949 (Hemmera 2015).

### 2.4 First Nations Engagement

CP commenced engagement with Indigenous communities on April 9, 2020. A list of engagement activities from April 9, 2020, to December 18, 2020, is provided in **Appendix C**. CP continues their engagement with Indigenous communities, including offsetting discussions, review of Project documents and reports, and participation in environmental monitoring.



**Project Location**



**Legend**

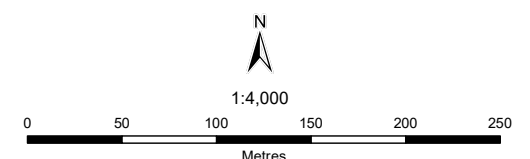
- Habitat Assessment Area
- CP Mileage
- Existing CP Railway

**Notes**

1. All mapped features are approximate and should be used for discussion purposes only.
2. This map is not intended to be a "stand-alone" document, but a visual aid of the information contained within the referenced Report. It is intended to be used in conjunction with the scope of services and limitations described therein.

**Sources**

- Contains information licensed under the Open Government Licences - Province of British Columbia and City of Vancouver
- Proposed Project Features: AECOM, 2019
- Aerial Image: City of Vancouver, 2015; ESRI World Imagery
- Inset Basemap: ESRI World Topographic Map



NAD 1983 CSRS UTM Zone 10N

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**DRAFT**  
For Discussion Purposes Only








**Project Location**



**Legend**

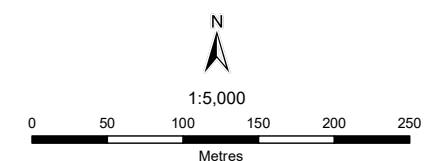
-  Habitat Assessment Area
-  CP Mileage
-  Existing CP Railway

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- Aerial Image: City of Vancouver, 2015; ESRI World Imagery
- Inset Basemap: ESRI World Topographic Map



NAD 1983 CSRS UTM Zone 10N

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104703-01      Production Date: Sep 8, 2020      Figure 1b



Path: S:\Geomatics\Projects\104703\104703\_01\mxd\habitat\_map\p104703\_01\_Project\_Location\_200908.mxd





**ISSUED FOR INFORMATION**  
DATE:

**LOCATION PLAN**  
SCALE 1:2500

- NOTES:
- VFPA (GVRD STORM OUTFALL) PLAN 2004-017 BBY088-00747-004
  - NOT ALL CHARGES, SRW'S AND EASEMENTS AFFECTING SUBJECT PROPERTIES ARE SHOWN
  - ELEVATIONS ARE IN m TO CGVD28

- REFERENCE MATERIALS:
- PROPERTY LINES BASED ON UNDERHILL PLAN H-3426-R5 (V17183-TOP-01-U-R5.dwg) DATED JUNE 23, 2020
  - VFPA LEASE PLAN 2017-012

Sep 04, 2020, 5:04pm Login name: KIM79037  
 Drawing Name: C:\pwworking\kim79037\p06933339\362379-PR-120-S0-005.dwg

ENCROACHMENT AREAS INSIDE CP ROW	
PROPOSED TRACK	
PROPERTY LINE	
HIGH WATER	
LOW WATER	
TOE OF SLOPE	
BUFFER	

**HATCH**

METRIC  
DIMENSIONS ARE IN METRES AND/OR MILLIMETRES  
UNLESS OTHERWISE NOTED

DESIGNED BY: T.I. DATE: 20-07-20	DRAWN BY: T.I. DATE: 20-07-20
CHECKED BY: J.C. DATE: 20-07-20	PROJECT MANAGER: J.L. DATE: 20-07-20
HATCH PROJECT No: <b>362379</b>	DWG SCALE(FULL SIZE): <b>1:2500</b>

PROFESSIONAL SEALS

No.	DATE	REVISION	BY
B	04-09-20	ISSUED FOR INFORMATION, UPDATED TOE AND BUFFER EXTENT	S.K.
A	21-07-20	ISSUED FOR INFORMATION	T.L.

THIS DRAWING WAS PREPARED FOR THE EXCLUSIVE USE OF CANADIAN PACIFIC CLIENT AND IS ISSUED PURSUANT TO THE HATCH-CP ENGINEERING SERVICES AGREEMENT AND RELEVANT PURCHASE ORDER BETWEEN CLIENT AND HATCH CORPORATION (HATCH), UNLESS OTHERWISE AGREED IN WRITING WITH CLIENT OR SPECIFIED ON THIS DRAWING. ALL HATCH DOES NOT ACCEPT AND DISCLAIMS ANY AND ALL LIABILITY OR RESPONSIBILITY ARISING FROM ANY USE OF OR RELIANCE ON THIS DRAWING BY ANY THIRD PARTY OR ANY MODIFICATION OR REVISION OF THIS DRAWING BY CLIENT, AND BY THIS DRAWING IS CONFIDENTIAL AND ALL INTELLECTUAL PROPERTY RIGHTS RESERVED OR REFERENCED IN THIS DRAWING REMAIN THE PROPERTY OF HATCH.

No.	DATE	REVISION	BY
B	04-09-20	ISSUED FOR INFORMATION, UPDATED TOE AND BUFFER EXTENT	S.K.
A	21-07-20	ISSUED FOR INFORMATION	T.L.

**CP**

ENGINEERING PROJECTS - WEST

VANCOUVER DIVISION MILE 122.93 TO 124.16 CASCADE SUBDIVISION

**CASCADIA EAST EXTENSION - PHASE 4  
PROPERTY OVERVIEW AND INFORMATION  
OVERALL PLAN**

DWG. BY:	CHK BY:	OFFICE FILE:
MANAGER - DESIGN:	DATE:	SCALE:
M.FAVREAU DIR. PROJECTS & PUBLIC WORKS - WEST	362379-PR-100-S0-100	Rev. <b>B</b>



## 3.0 METHODS

The AEA consisted of a desktop literature review and in-person biophysical inventory of the study area. For the purposes of this AEA, the study area includes the Project footprint and all areas within 100 m of this footprint. Detailed descriptions of the methods are described in **Sections 3.1** and **3.2**. A summary of assessment locations can be found in **Figures 3a** and **3b**. The objective of the literature review and site assessment was to identify existing habitat conditions, with a particular focus on identifying sensitive habitats (i.e., tidal marshes, eelgrass beds, kelp beds, herring spawning habitat, salmonid rearing habitat, or bivalve shellfish beds), and species at risk that may be present in the local setting or the Project footprint. Species at risk listed on Schedule 1 of the federal *Species at Risk Act*, SC 2002, c. 29, are also discussed.

### 3.1 Literature Review

The following sources of information were reviewed prior to the site visit, as part of the desktop component of the assessment:

- The Burrard Inlet Environmental Action Program & Fraser River Estuary Management Program Habitat Atlas – for intertidal vegetation and substrate information (BIEAP - FREMP 2002)
- The BC Coastal Resource Information System website – to determine the likelihood of sensitive marine habitats, including the presence of eelgrass and kelp beds, herring spawning grounds or salmon or herring holding grounds, and clam beds (Government of British Columbia 2015)
- The B.C. Species and Ecosystems Explorer – to generate a list of federally listed, Schedule 1 SAR with the potential to occur in the vicinity of the Project (Government of British Columbia 2021)
- The Burrard Inlet Action Plan – to identify fish and fish habitat values and the existing pressures exerted upon them within the context of Burrard Inlet (Tsleil-Waututh Nation 2017)
- Phase 1 Environmental Site Assessment and General Biophysical Assessment Second Narrows Lease Property, Burnaby, BC – as a source of background information and references on the biophysical characteristics of the site (Hemmera 2015).

### 3.2 Fish and Fish Habitat Field Assessments

A team of qualified professional biologists registered with the College of Applied Biology of BC conducted field assessments to confirm the biophysical conditions of fish and fish habitat. The field assessments included:

- Subtidal biophysical surveys
- Intertidal habitat surveys
- Bivalve sampling surveys
- Riparian vegetation surveys
- Watercourse and culvert assessments.

### 3.2.1 Subtidal Habitat Surveys

A benthic habitat survey was conducted by a team of WorkSafeBC-certified self-contained underwater breathing apparatus (SCUBA) divers, both qualified marine biologists, on June 13 and 14, 2020, following the DFO Marine Foreshore Environmental Assessment Procedure (Government of Canada 2004). Nine transects were established perpendicular to the waterline. The start and end coordinates of each transect were collected with a Garmin geographic positioning system (GPS), and underwater video was recorded using a high-definition GoPro camera. All fish observed were recorded by the lead diver during his seaward swim, as he laid out a measuring tape to the estimated site boundary between 30 m and 40 m from the HHWLT. Transect surveys consisted of assessing marine biota within a 1 x 1 m quadrat area every 5 m along the transect line. Within each 1.0-square-metre (m<sup>2</sup>) area, the diver recorded transect position, depth, substrate type, vegetation cover, sessile invertebrate cover, mobile invertebrate density, and fish density. Substrate type and relative composition were described visually using a generalized Wentworth-based scale (Wentworth 1922) (**Table 3.1**).

**Table 3.1 Substrate Classification**

Substrate Type	Size Range (Diameter in Millimetres)
Bedrock/boulder	>256
Cobble	64–256
Gravel	2–64
Sand	0.06–2
Silt/clay/mud	<0.06
Other*	–

**Notes:**

\*Substrates can also include anthropogenic structures, wood debris and shell hash etc., all of which were characterized under “substrate – other” during field sampling.

> indicates greater than.

< indicates less than.

### 3.2.2 Intertidal Habitat Surveys

An upper intertidal and marine foreshore riparian survey was conducted by qualified terrestrial biologists on July 6, 2020. An aerial drone survey of the entire Project footprint was conducted to create detailed habitat maps. Random sampling points were then established throughout both east and west extents to provide reference points and ground truth the drone images. At these random sampling points, a 0.25 m x 0.25 m quadrat was established, and the biologist recorded substrate composition, sessile invertebrate cover, and mobile invertebrate cover within the quadrat.

### 3.2.3 Bivalve Sampling Surveys

Bivalve sampling was conducted within the lower intertidal habitat. A team of 2 Hemmera biologists collected infaunal samples from 12 separate 25-centimetre (cm) x 25 cm quadrats to a depth of 25 cm. Sediments excavated were passed through a coarse sieve and bivalves present were collected, counted, and measured along their latitudinal axis. After sampling, bivalves were returned to the excavated area and reburied. The excavated area was then refilled, levelled, and smoothed to minimize aesthetic effects.

### 3.2.4 Riparian Vegetation Surveys

A marine foreshore riparian survey was conducted by qualified terrestrial biologists on July 6, 2020. The riparian stand which runs east–west throughout the Project area was assessed. Information recorded included plant species and approximate plant numbers, trunk diameter at breast height of representative trees, and vegetative cover where relevant (e.g., extent of coverage by invasive plant species such as Himalayan blackberry, *Rubus armeniacus*).

### 3.2.5 Watercourse and Culvert Assessment

A watercourse assessment was conducted by a team of qualified freshwater aquatic biologists on June 19, 2020. The team walked the study area to identify watercourses (permanent and non-permanent) and drainage features. An iPad with Avenza software was used to geo-reference culvert locations and watercourse alignments during the assessment. A photo record was collected at each georeferenced point. At each permanent watercourse, 3 transect measurements were collected upstream and downstream of the existing rail track. Bankfull width, bankfull depth, wetted width, wetted depth, and upstream and downstream gradients were collected at each transect. Substrate composition and riparian vegetation were characterized for each watercourse, and anthropogenic structures and disturbance indicators were documented. Water quality parameters including acidity (pH units), dissolved oxygen (percent, %), conductivity (microsiemens per centimetre, uS/cm), temperature (degrees Celsius, °C), and turbidity (nephelometric turbidity units, NTUs) were collected at each transect in permanent watercourses. Fish observations were recorded and georeferenced and an assessment of fish habitat suitability was completed based on site observations. At ephemeral watercourses, channel conditions were documented including characterization of channel morphology, water conveyance structures (i.e., culverts), vegetation conditions, and an assessment of fish habitat suitability.



Habitat Impact Summary

Legend

- Proposed Track Extension
- Existing CP Railway
- - CP Right-of-Way
- Toe of Slope
- - Buffer (7m Buffer to Toe)
- - High Water
- - Low Water
- Parcel Boundary
- Habitat Impact**
- Permanent Alteration - Marine
- Destruction - Marine
- Permanent Alteration - Riparian

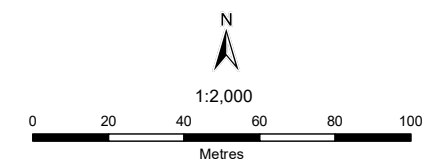


Notes

1. All mapped features are approximate and should be used for discussion purposes only.
2. This map is not intended to be a "stand-alone" document, but a visual aid of the information contained within the referenced Report. It is intended to be used in conjunction with the scope of services and limitations described therein.

Sources

- Contains information licensed under the Open Government Licences - Province of British Columbia and City of Vancouver
- Proposed Project Features: AECOM, 2019, Hatch, 2020
- Aerial Image: City of Vancouver, 2015



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Production Date: Sep 15, 2020

Figure 3a



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**Habitat Impact Summary**

**Legend**

- +— Proposed Track Extension
- +— Existing CP Railway
- - - CP Right-of-Way
- +— Toe of Slope
- - - Buffer (7m Buffer to Toe)
- +— High Water
- +— Low Water
- +— Parcel Boundary

**Habitat Impact**

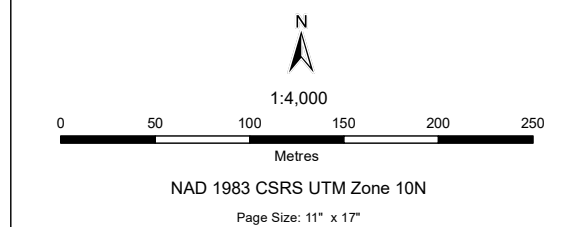
- Permanent Alteration - Marine
- Destruction - Marine
- Permanent Alteration - Riparian
- Destruction - Riparian

**Notes**

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- Aerial Image: City of Vancouver, 2015



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ETON ST

N BETA AVE

LIBERTY PL

N GAMMA AVE

BRISBANE CRES

UNNAMED LANE N DELTA AVE

N HYPHE AVE

BESSBOROUGH DR

HARBOUR VIEW RD

N GLYNDE AVE

PENZANCE DR

SCENIC HWY

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## 4.0 HABITAT COMPONENTS AND MECHANISMS WITH POTENTIAL TO AFFECT FISH AND FISH HABITAT

### 4.1 Regional and General Setting

Burrard Inlet is a coastal fjord in the southeastern portion of the Strait of Georgia with a drainage basin of 98,000 hectares. Those portions of its terrestrial habitats that were or still are in pristine condition are typical of the Coastal Western Hemlock Dry Maritime biogeoclimatic subzone consisting of structurally complex forests in a wet and mild climate (Meidinger and Pojar 1991). Burrard Inlet is located within one of Canada's most productive marine ecoregions, supporting rich communities of marine invertebrates, fishes, and marine mammals. The inlet is bordered by the cities of Metro Vancouver and is highly urbanized, with industrial lands bordering shoreline areas within the Port of Vancouver. Nevertheless, the inlet supports robust marine ecosystems and fisheries (e.g., a Dungeness crab fishery). Approximately 45% of the Burrard Inlet's 190 km shoreline has been altered for human use (Haggarty 2001).

The site is located on the south shore of Burrard Inlet, just east of the Second Narrows (**Appendix D: Photos 1 and 2**), a 600 m wide narrowing which results in high tidal-driven currents that can reach up to approximately 6 knots (Stacey and Pond 2003). Unlike typical coastal inlets of BC, Burrard Inlet is relatively shallow between the First Narrows area (Lions Gate Bridge) and the head at Port Moody, with a mean depth of 21 m. The main runoff to areas between or near the First and Second Narrows is from the Seymour River and the Capilano River. The monthly mean discharge of the Seymour River ranges from 3.8 cubic metres per second (m<sup>3</sup>/s) to 24.9 m<sup>3</sup>/s, while the Capilano River's discharge ranges from 5.7 m<sup>3</sup>/s to 42.8 m<sup>3</sup>/s. Other significant tributaries and sources of freshwater inflow include Lynn Creek near the Seymour River, Mosquito and Mackay Creeks in North Vancouver, and Noons Creek in Port Moody (Moody Arm). In addition, the Indian River flows into the head of Indian Arm, which extends 20 km northward from Burrard Inlet.

The Project site lies within the Eastern Burrard Inlet Rockfish Conservation Area (RCA). RCAs were established by DFO in 2001 in response to the decline of inshore rockfish species. RCAs protect rockfish and rockfish habitats by prohibiting fishing, particularly ground fishing and bottom trawling. The Eastern Burrard Inlet RCA covers an area of 2.8 square kilometres, of which 2.3% provides habitat to rockfish (Government of Canada 2019a).

Additionally, the Maplewood Flats Conservation Area lies approximately 1 km northeast of the site, providing productive tidal flats with clam beds, and adjacent subtidal kelp and eelgrass bed habitats (Tsleil-Waututh Nation 2017). A compensation habitat project intended to create additional reef and clam bed habitat was recently completed at Maplewood Flats. The RCA's western limit is located approximately 600 m east of the site (Government of Canada 2015).

### 4.2 Fish Habitat Description

#### 4.2.1 Freshwater Habitat

During the desktop review, 4 watercourses were identified as crossing through the study area (**Figure 4a; Table 4.1**) - based on City of Burnaby Open Portal GIS data queried in June 2020. These watercourses were not documented on provincial databases (i.e., Freshwater Atlas or Ministry of Environment Habitat Wizard). Watercourses and drainages located through the AEA study area have a north-facing aspect and flow northward to discharge into Burrard Inlet. Headwaters of the mapped watercourses originate north of residential development within contiguous upland mixed forest habitat along the northern boundary of Burnaby. A review of the BC Conservation Data Centre indicates there are no documented freshwater

aquatic species at risk that overlap the study area watercourses. A review of the DFO aquatic species-at-risk map indicates that there is no freshwater aquatic critical habitat or species at risk found or potentially found within the freshwater aquatic study area. **Sections 4.2.1.1** through **Section 4.2.1.3** provide a detailed assessment of permanent watercourses and ephemeral watercourses and a brief overview assessment of drainage culverts, respectively, in the study area.



**Watercourse Assessment**



**T-1:**  
Bankfull Width: 2.32 m  
Bankfull Depth: 0.21 m  
Wetted Width: 1.14 m  
Wetted Depth: 0.06 m  
Gradient: 3%

**T-2:**  
Bankfull Width: 2.62 m  
Bankfull Depth: 0.43 m  
Wetted Width: 1.10 m  
Wetted Depth: 0.16 m  
Gradient: 4%

**T-3:**  
Bankfull Width: 2.1 m  
Bankfull Depth: 0.18 m  
Wetted Width: 1.46 m  
Wetted Depth: 0.05 m  
Gradient: 5%

New culvert installed  
upstream watercourse  
diversion around  
the channel during  
field assessment

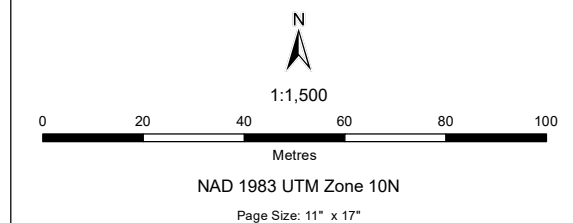
**Legend**

- Survey Location
- ◆ Visual Fish Observation Location
- Railway
- Marine Water
- Recreation, Open Space or Protected Natural Area

- Notes**
1. All mapped features are approximate and should be used for discussion purposes only.
  2. This map is not intended to be a "stand-alone" document, but a visual aid of the information contained within the referenced Report. It is intended to be used in conjunction with the scope of services and limitations described therein.
  3. Watercourse field measurements were collected on June 19, 2020.

**Sources**

- Contains information licensed under the Open Government Licence - Government of British Columbia, City of Burnaby, Metro Vancouver
- Aerial Image: ESRI World Imagery
- Inset Basemap: ESRI World Topographic



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**Table 4.1 Permanent and Ephemeral Watercourses in the Study Area**

FWA Watershed ID	Local Stream Name	Stream Order <sup>1</sup>	Stream Type
No ID	Crabtown Creek	1	Non-permanent <sup>2</sup>
No ID	Starfish Creek	1	Non-permanent
No ID	Mill Creek	1	Non-permanent
No ID	Rainbow Creek	2	Permanent
No ID	Unnamed Watercourse-1	1	Non-permanent

**4.2.1.1 Non-permanent Watercourses**

**Crabtown Creek**

Crabtown Creek flows through the western extent of the study area and outside the proposed Project footprint. This watercourse flows through the Cascadia Phase 3 footprint, which was constructed in 2019 and lies immediately to the west of the proposed Cascadia Phase 4 Project footprint. During the site assessment, no defined channel was observed south of the existing rail track alignment. The south slope has an approximate gradient of 70%. Field conditions indicate that there are no significant headwaters, and that discharge is heavily influenced by rainfall.

South slope drainage runoff is collected along perimeter ditch lines south of the track that may discharge to the Crabtown Creek drainage during the wet season. An anthropogenic structure (**Appendix D: Photo 3**) was observed south of the existing rail track and appears to be a catch basin for the Crabtown Creek drainage. Flows are conveyed under the existing rail track via an approximately 0.76 m diameter corrugated metal culvert (CMC) that outlets to a riprap bank perched above the high-water mark of Burrard Inlet (**Appendix D: Photo 4**).

Vegetation colonizing the ditch on the south side of the existing rail track predominantly comprises common horsetail (*Equisetum arvense*) and Himalayan balsam (*Impatiens glandulifera*). Native riparian vegetation was characterized by bigleaf maple (*Acer macrophyllum*) and black cottonwood (*Populus trichocarpa*) with periodic native understorey vegetation present, namely red elderberry (*Sambucus racemosa*). Riparian vegetation was affected by non-native invasive vegetation including Himalayan balsam and Himalayan blackberry (*Rubus armeniacus*). Crabtown Creek does not provide habitat for fish.

**Starfish Creek**

Starfish Creek crosses through the study area and is conveyed through a CMC underneath existing rail track. There was no well-defined channel identified during the field assessment, and the drainage was observed discharging northward over a bedrock slope south of the existing rail track. The gradient was approximately 89% along the bedrock slope. Starfish Creek substrate was characterized predominantly as bedrock. Field conditions indicated that Starfish Creek does not have a significant headwater source; however, flows are expected to increase during periods of elevated surface water runoff. Starfish Creek was observed discharging into a grated access hole south of the existing rail track (**Appendix D: Photo 5**),

<sup>1</sup> Stream order was determined based on a review of City of Burnaby GIS open portal data and was not ground-truthed during the site assessment.

<sup>2</sup> For the purposes of this assessment, non-permanent watercourses are defined as watercourses that are ephemeral (i.e., seasonal flow) without a well-defined channel (i.e., banks and scour). Permanent watercourses are defined as watercourses with anticipated year-round flow and a well-defined channel with evidence of scour.

then conveyed through a perched CMC that discharges to the Burrard Inlet shoreline (**Appendix D: Photo 6**). The vegetation community adjacent to the drainage is characterized by a deciduous stand of red alder (*Alnus rubra*) and bigleaf maple. Understorey vegetation was dominated by invasive Himalayan balsam and Himalayan blackberry with periodic occurrences of native riparian vegetation including red huckleberry (*Vaccinium parvifolium*), salmonberry (*Rubus spectabilis*), and goatsbeard (*Aruncus dioicus*). Starfish Creek does not provide suitable habitat for fish.

### Mill Creek

Mill Creek crosses through the study area, is conveyed through a 0.78 m diameter perched CMC underneath the existing rail track, and discharges to the riprap slope north of the CP mainline and shoreline of Burrard Inlet. No upstream channel was identified during the field assessment. A catch basin (Structure-1) was observed south of the existing rail track (**Appendix D: Photo 7**) and collects flow along perimeter ditch lines that parallel the south side of the existing rail track. No discharge from the perimeter ditch lines was observed during the site assessment; however, water was observed in Structure-1, indicating that there is another source of flow input to Structure-1. Flow is conveyed from Structure-1 to the outlet (**Appendix D: Photo 8**). Vegetation was characterized as deciduous forest comprised of red alder, bigleaf maple, and black cottonwood. Understorey vegetation was dominated by invasive Himalayan blackberry. There was no functional fish habitat present in the Mill Creek study area.

### Watercourse-1

During the site assessment, Hemmera observed an unnamed watercourse (Watercourse-1) that crosses through the Project study area and is conveyed under the existing rail track through a 0.78 m diameter CMC. Watercourse-1 had a bankfull width of 0.39 m and bankfull depth of 0.05 m approximately 15-m upstream from the existing rail track infrastructure at Transect-1. Watercourse-1 channel gradients were approximately 20% upstream and 6% downstream from Transect-1. During the site assessment, immediately upstream of the culvert inlet the wetted width was 1.12 m, the wetted depth was 0.015 m, and substrates were characterized as predominantly small gravels and sands. Upstream of the CMC inlet, channel conditions were characterized as a wet depression with vegetation comprising horsetail (*Equisetum*) species, Himalayan balsam, and red elderberry (**Appendix D: Photo 9**).

Perimeter ditches that parallel the south side of the existing rail track convey flow to Watercourse-1 immediately upstream of the CMC inlet. The CMC outlet is perched and discharges to the Burrard Inlet shoreline above the high-water line (HWL). During the site assessment, no defined channel was observed downstream of the culvert outlet (**Appendix D: Photo 10**). Riparian vegetation was characterized by the following native riparian species: bigleaf maple, red alder, salmonberry, western sword fern (*Polystichum munitum*), deer fern, devil's club, vine maple, and red elderberry. Fish habitat at Watercourse-1 is assessed as negligible due to the limited source of headwater flows, limited surface flow connectivity with downstream fish habitat, obstacles to movement created by the CMC, and limited suitable habitat south of the existing rail track infrastructure.

#### 4.2.1.2 Permanent Watercourses

##### Rainbow Creek

During the site assessment, Hemmera identified one permanent watercourse, Rainbow Creek (**Appendix D: Photo 11** and **12**), crossing the study area and conveyed under the existing rail track via concrete box culvert (**Appendix D: Photo 13** and **14**). The concrete box culvert was approximately 1.22 m wide with a height of 1.1 m. Channel morphology, habitat characteristics, and water quality information were collected from 3 transects within the study area (T-1, T-2, and T-3). The average bankfull width was 2.3 m, average bankfull depth was 0.27 m, average wetted width was 1.2 m, and average wetted depth was 0.09 m during the site assessment. Rainbow Creek had an average channel gradient of 4%. Substrates were dominated by small cobbles with lesser amounts of fines, boulders, and gravels.

All water quality parameters for dissolved oxygen, temperature, pH, and turbidity (**Table 4.2**) were within BC Approved Water Quality Guidelines for the protection of freshwater aquatic life and were within generally optimal ranges to support fish habitat (Government of British Columbia 2019). Elevated water turbidity levels were observed and were attributed to culvert installation activities ongoing upstream of the study area during the site assessment.

Riparian habitat along Rainbow Creek was characterized by mixed forest with a well-developed understorey shrub layer. Native riparian observed during the site assessment included bigleaf maple, red alder, black cottonwood, western redcedar (*Thuja plicata*), western hemlock (*Tsuga heterophylla*), Douglas maple (*Acer glabrum*), salmonberry, western sword fern, stinging nettle (*Urtica dioica*), red elderberry, and stink current (*Ribes bracteosum*). The integrity of native riparian vegetation was intact and functional. Periodic occurrences of non-native and invasive plant species were observed: Himalayan balsam, buttercup species, Himalayan blackberry, and English ivy (*Hedera helix*).

Fish habitat features observed to be present during the site assessment included small woody debris, undercut banks, overhanging vegetation, and periodic occurrences of functional large woody debris. Disturbance indicators observed during the site assessment included the presence of anthropogenic debris in the watercourse (i.e., garbage, old tires, sheet metal), the diversion of the watercourse upstream of the Project study area to facilitate new culvert installation, and areas of accumulated small woody debris and fines.

Two unidentified juvenile salmonids were observed immediately upstream of the box culvert inlet near T-2. Rainbow Creek provides moderate value habitat juvenile salmonid rearing. Salmonid over-wintering and spawning habitat is limited.



**Table 4.2 Detailed Watercourse Information for Rainbow Creek**

Parameter	T-1	T-2	T-3	Average
Bankfull width (m)	2.32	2.62	2.1	2.3
Bankfull depth (m)	0.21	0.43	0.18	0.27
Wetted width (m)	1.14	1.10	1.46	1.2
Wetted depth (m)	0.06	0.16	0.05	0.09
Gradient (%)	3	4	4.5	4
Dissolved oxygen (mg/L)	10.10	10	9.88	10.0
Temperature (°C)	12.8	12.8	12.9	12.8
pH (pH units)	6.5	6.39	6.20	6.4
Turbidity (NTU)	10.85	2.5	2.72	5.4
Conductivity (uS/cm)	210.9	202.7	205.6	206.4
Salinity (mg/L)	0.13	0.13	0.13	0.13

**Note:** mg/L – milligrams per litre

#### **4.2.1.3 Stormwater Drainages**

During the site assessment, Hemmera identified multiple occurrences of existing culvert crossings under the rail grade throughout the Project study area. Perimeter ditches located along the south side of the existing rail track collect stormwater runoff from the upland slopes to the south of the study area. The ditches subsequently drain to culvert inlets that convey surface runoff water underneath the existing rail track and outlet to the Burrard Inlet. These ditch lines and associated culverts function to convey stormwater past existing rail infrastructure. Given the perched nature of these culverts, the intermittent flow conditions, and the limited connectivity to upland fish habitat (e.g., steep bedrock slopes), the perimeter ditches are not considered fish habitat. However, these ditches and culverts provide important stormwater management functions to protect railway infrastructure as well as mitigate erosion and sedimentation to Burrard Inlet. The parkland located upland of the rail tracks (Confederation and Montrose parks) is a source of food and nutrient input to Burrard Inlet via the drainages.



Habitat and Infaunal Sampling Locations



Legend

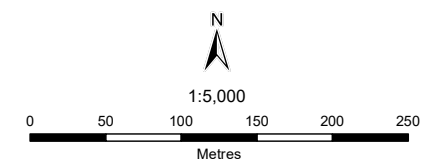
- Habitat Classification Sample Location
- Infaunal Sample Location
- Dive Transect Starting Location
- Watercourse Assessment Location
- Dive Transect
- Habitat Assessment Area
- CP Mileage
- Existing CP Railway
- Stream

Notes

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2. This map is not intended to be a "stand-alone" document, but a visual aid of the information contained within the referenced Report. It is intended to be used in conjunction with the scope of services and limitations described therein.
3. D9 location is approximate

Sources

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- Aerial Image: City of Vancouver, 2015; ESRI World Imagery
- Inset Basemap: ESRI World Topographic Map



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Habitat and Infaunal Sampling Locations



Legend

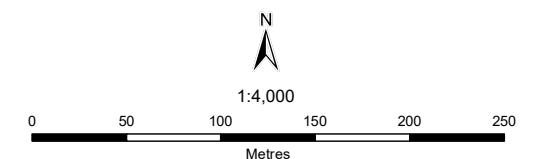
- Habitat Classification Sample Location
- Infaunal Sample Location
- Dive Transect Starting Location
- Watercourse Assessment Location
- Dive Transect
- Habitat Assessment Area
- CP Mileage
- Existing CP Railway
- Stream

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#### 4.2.2 Riparian Habitat

Natural marine riparian vegetation communities are defined as non-wetland vegetation above the high intertidal zone within upland elevations that are influenced by marine spray. Upland is considered above the HWL of 7.5 m CD. The existing riparian habitat within the Project footprint is limited by the existing rail infrastructure. The marine riparian vegetation identified within the study area is located between the existing rail lines and the HWL. CP actively maintains vegetation along the edges of their tracks to reduce fire hazards and maintain sightlines. West of the refinery, 5,102 m<sup>2</sup> of riparian vegetation colonizes the north side of the rail ballast and the available substrate above the HWL. Marine-influenced riparian vegetation consists of predominantly mixed salmonberry and Himalayan blackberry. Larger trees found throughout the area include red alder, western hemlock, and bigleaf maple (**Appendix D: Photos 15 and 16**). When measured at breast height, the average circumference of mature trees was approximately 0.85 m (**Appendix D: Photo 17**).

English ivy has colonized the study area and was observed growing on the bases of most mature trees and across the ground as low cover (**Appendix D: Photo 18**). English ivy is an invasive species that can suppress and smother native vegetation by forming dense ground cover and climbing on other plants and trees (IPCBC 2017).

East of the refinery, a wooded section of land approximately 200 m long extends seaward of the rail line. The average width of this vegetated area is approximately 35 m, so it meets most criteria for providing the full width of riparian vegetation (Government of British Columbia 2006a). This wooded stand is characterized by mature red alder, black cottonwood, and bigleaf maple (**Appendix D: Photo 19**). East of this area, the vegetation narrows to a single strip of trees growing at the base of the rail ballast, immediately above the HWL. Riparian vegetation east of the refinery is characterized predominantly by salmonberry with intermittently scattered sword ferns (**Appendix D: Photos 20 and 21**). Trees are exclusively red alder, with an average trunk circumference of 150 cm when measured at breast height.

In total, the area east of the refinery provides 11,365 m<sup>2</sup> of riparian vegetation. A full list of riparian vegetation species identified within the study area can be found in **Table 4.3**.

The value of marine riparian as fish habitat is created by its ability to provide shade, supply and/or filter shore-derived sediment, stabilize shorelines, and filter and mineralize non-point-source organic pollutants (e.g., nitrates) (Levings and Jamieson 2001). Currently, the marine riparian vegetation within the Project footprint does not provide substantive benefits to fish habitat in terms of shading, bank stabilization, a buffer for erosion, or overhanging cover. The vegetation currently present along the north side of the rail grade provides food and nutrient input to the marine environment through leaf and litter drop, and shading of the highest intertidal elevations. The importance of this relatively small riparian area is greatly reduced given the very large surface area and volume of the receiving environment.

**Table 4.3 Riparian Species within the Study Area**

Common Name	Species Name	East	West
American mountain ash	<i>Sorbus americana</i>	✓	
Aster	<i>Aster sp.</i>	✓	✓
Bigleaf maple	<i>Acer macrophyllum</i>	✓	✓
Black cottonwood	<i>Populus trichocarpa</i>	✓	✓
Black medick	<i>Medicago lupulina</i>		✓
Cherry laurel	<i>Prunus laurocerasus</i>	✓	
Common horsetail	<i>Equisetum arvense</i>	✓	
Common Scotch broom	<i>Cytisus scoparius</i>	✓	✓
Deer fern	<i>Blechnum spicant</i>	✓	✓
Douglas maple	<i>Acer glabrum</i>	✓	
English ivy	<i>Hedera helix</i>		✓
Goatsbeard	<i>Aruncus dioicus</i>	✓	
Himalayan balsam	<i>Impatiens glandulifera</i>	✓	
Himalayan blackberry	<i>Rubus armeniacus</i>	✓	✓
Large bindweed	<i>Convolvulus sepium</i>	✓	
Large vetch	<i>Vicia gigantea</i>	✓	
Nipplewort	<i>Lupsana communis</i>		✓
Oak	<i>Quercus sp.</i>	✓	✓
Osoberry	<i>Omeleria cerasiformis</i>	✓	
Paper birch	<i>Betula papyrefira</i>		✓
Perennial sow thistle	<i>Sonchus arvensis</i>	✓	
Purple foxglove	<i>Digitalis purpurea</i>	✓	✓
Red alder	<i>Alnus rubra</i>	✓	✓
Red-berried elder	<i>Sambucus racemosa</i>	✓	
Red huckleberry	<i>Vaccinium parviflorum</i>	✓	
Rugose rose	<i>Rosa rugosa</i>	✓	
Salmonberry	<i>Rubus spectabilis</i>	✓	✓
Silverweed	<i>Argentina anserina</i>	✓	
Stinging nettle	<i>Urtica dioica</i>	✓	
Stink current	<i>Ribes bracteosum</i>	✓	
Sweet vernal grass	<i>Anthoxanthum odoratum</i>		✓
Sword fern	<i>Polystichum munitum</i>	✓	✓
Thimbleberry	<i>Rubus parviflorus</i>	✓	✓
Wall lettuce	<i>Mycelis muralis</i>	✓	✓
Western hemlock	<i>Tsuga heterophylla</i>		✓
Western red cedar	<i>Thuja plicata</i>	✓	
Willow	<i>Salix sp.</i>	✓	✓

**Notes:** east = east of the refinery; west = west of the refinery.

### 4.2.3 Intertidal Habitat

The intertidal zone, also known as the foreshore, seashore, or littoral zone, is defined as the zone above the LWL and below the HWL. It is inundated twice daily by marine waters. The fluctuations in intertidal elevation determine the duration of exposure to air during each tidal cycle. These fluctuations, together with air and seawater temperature, salinity, exposure to freshwater inputs during low tides, wave exposure, and species interactions (e.g., competition for space and resources, predation, etc.) result in zones or bands of distinct marine flora and fauna along rocky Pacific Northwest shorelines. Bands in the upper intertidal are dominated by species such as barnacles (*Balanus glandula*), littorinid snails, and rockweed (*Fucus* spp.), all of which have high tolerance to atmospheric conditions such as summer heat or winter freezing, and to freshwater inputs from runoff or rain. Bands in the lower subtidal are those requiring longer durations of seawater submersion such as red algae and kelps, and are better adapted to interspecific interactions occurring in the marine ecosystem.

A total of 48,663 m<sup>2</sup> of intertidal habitat was mapped within the study area. Of this, 6,374 m<sup>2</sup> consists of *Fucus* habitat, 24,189 m<sup>2</sup> of benthic algal community, and 18,100 m<sup>2</sup> of unvegetated habitat (**Figures 5a** and **5b**). Kelp and benthic algal habitats occur in the intertidal zone; however, they are discussed in detail in **Section 4.2.4**.

#### 4.2.3.1 *Fucus* Habitat

At and immediately below the HWL, boulders and riprap form the seaward edge of the rail grade, accounting for 48% of substrate at this elevation east of the refinery and 33% of substrate west of the refinery. Colonization by rockweed (*Fucus distichus*) is common throughout this elevation, with occasional Turkish washcloth (*Mastocarpus papillatus*) (**Appendix D: Photo 22**). In this *Fucus* habitat, a mix of limpets (*Lottia* spp.), acorn barnacles, and periwinkles (*Littorina* spp.) colonize the vegetation substrate (**Appendix D: Photo 23**). Substrates of smaller size classes than cobble were largely unvegetated. When substrates were bare or lacking in algal cover, faunal observations were similarly low and were restricted to green shore crabs (*Hemigrapsus oregonensis*) and purple shore crabs (*Hemigrapsus nudus*) residing generally beneath the occasional boulder and cobble substrates.

#### 4.2.3.2 *Benthic Algal* Habitat

East of the refinery, the mid- and low intertidal is largely bare, as sand (24%) and gravel (47%) dominate. Where present, boulder and cobble substrates are colonized by rockweed and sea lettuce (*Ulva lactuca*). The latter increases in abundance at lower elevations. A single artificial reef structure has been constructed immediately east of the outlet of Rainbow Creek. The reef consists predominantly of cobble and boulder (10% and 90% respectively) and is heavily vegetated by rockweed and colonized by acorn barnacles.

West of the refinery, the substrate in the mid- and low intertidal is generally coarser than that found to the east. Bare cobble beaches are found in place of the cobble/gravel/sand matrix, and the intertidal zone is dominated by large bedrock protrusions (**Appendix D: Photo 24**). In the mid-intertidal, the bedrock substrate is heavily colonized by diatomaceous growth along with occasional rockweed, sea lettuce, sea cauliflower (*Lethesia marina*), and black pine (*Neorhodomela larix*) (**Appendix D: Photo 25**). Descending toward the low-water line (LWL), the diversity of the benthic algal layer increases to include sugar kelp (*Saccarina latissima*). Bull kelp (*Nereocystis lutkeana*) colonizes the coarse substrates at the lowest intertidal elevations. Bull kelp is an important canopy-forming kelp species that forms large aggregations in

the lower intertidal and upper subtidal zones of coastal BC. Bull kelp forests provide important cover and habitat complexity to a variety of juvenile and adult finfish and marine invertebrates (Scagel 1961).

Surveys of the infaunal community (within the substrate) were conducted within the intertidal benthic algal habitat zone. Invertebrates observed colonizing the study area were cockles (*Cardiidae* spp.) and gaper clams (*Macoma* spp.) (**Appendix D: Photos 26 and 27**). The samples uncovered a mean of 3.3 organisms per quadrat, with a range of 0 per quadrat to 13 per quadrat. Abundance had a mean of 5.0 organisms per quadrat west of the refinery and 2.0 organisms per quadrat east of the refinery.

#### 4.2.4 Subtidal Habitat

The nearshore shallow subtidal zone that lies below the LWL is influenced by tidal currents and remains submerged during low tide. Within the study area, the subtidal zone demonstrates marked differences between the west side of the refinery and the east side.

East of the refinery, the grade is shallow and the subtidal zone represents a continuation of the sand, gravel, and cobble substrates present in the mid- and low intertidal zones (**Appendix D: Photo 28**). The slope gradually steepens to the west as the study area nears Second Narrows. Substrate west of the refinery is characterized by bedrock shelves and outcroppings with abundant erratic boulders descending to approximately -3 m CD, where it transitions to a flat sand and gravel seafloor (**Appendix D: Photo 29**).

##### 4.2.4.1 Benthic Algal Habitat

Within the study area, the benthic algal community is abundant on available hard substrates in a narrow band between the low intertidal zone (approximately 1.5 m CD) and the transition to soft substrate in the subtidal zone (approximately -3 m CD) (**Appendix D: Photo 30**). Understorey algal species identified during field studies are listed in **Appendix E**. Benthic algae do not colonize soft substrates although occasionally, unidentified red filamentous algae were observed attached to shell debris or single pieces of cobble and gravel. Soft sediment increased in mean occurrence with increasing depth, which is correlated with a decrease in mean coverage of algae from approximately 50% coverage between 1 m and -1 m CD to a mean coverage of approximately 20% below -1 m CD. A total of 24,189 m<sup>2</sup> of subtidal benthic algal habitat was mapped within the Project footprint (**Figures 5a and 5b**). Overall, benthic algal habitat within the Project area is highly available and is of moderate value, except where associated with kelp bed habitat.

East of the refinery, the benthic algal habitat is characterized by mobile invertebrates that colonize mixed substrates, including mottled stars (*Evasterias troschelii*), ochre stars (*Pisaster ochraceus*), leather stars (*Dermasterias imbricata*), and Dungeness crabs (*Metacarcinus magister*) (**Appendix D: Photos 31, 32, and 33**). Sessile invertebrates are generally limited to acorn barnacles colonizing the larger substrate and a variety of infaunal bivalves living in the sediment, including horse clams (*Tresus* spp.) and gaper clams (*Macoma* spp.).

West of the refinery, the invertebrate community is more diverse, representing the harder substrate availability in this area. Mobile invertebrates include red rock crab (*Cancer productus*), orange sea cucumber (*Cucumaria miniata*), and opalescent nudibranch (*Hermisenda crassicornis*). In addition to horse clams and gaper clams, the bedrock west of the refinery is colonized by piddock clams (*Zirfaea pilsbryi*), a species that uses its roughened shell to bore into hard substrates.

#### 4.2.4.2 Kelp Bed Habitat

Kelp bed habitat within the Project area consists of a band of bull kelp between approximately 0 m CD and -7 m CD, and generally at the seaward limit of the benthic algal layer described above. Bull kelp individuals are occasionally found in deeper areas outside these narrow bands. Bull kelp stipes were observed in 13 quadrats (14% of quadrats) during subtidal SCUBA surveys. Where present, mean stipe density was 5 stipes per square metre, normal for kelp beds in which grazing species such as urchins are present (Springer et al. 2010). Within the study area, kelp beds were closely associated with an abundant benthic algal understorey. Overall, kelp bed habitat occurs throughout the Project area and is moderately abundant. A total of 17,126 m<sup>2</sup> of kelp bed habitat was mapped within and adjacent to the study area. Notably, east of the refinery, abundant wireweed (*Sargassum muticum*), an invasive algal species, was observed to be colonizing the benthic algal and kelp bed habitats. Encrusting and coralline algae (*Corralina spp.* and *Hildenbrandia rubra*) are scarce within the study area and are generally concentrated on the bedrock and boulder habitat west of the refinery.

Within the kelp band, invertebrates using the kelp stipes and bulbs are commonplace and consist of kelp crabs (*Pugettia spp.*) and decorator crabs (*Majoidae spp.*). On the substrate, the invertebrate community resembles that of the benthic algal community, consisting of sea stars, crabs, cucumbers, and bivalves.

A total of 24,189 m<sup>2</sup> of benthic algal community and 17,126 m<sup>2</sup> of kelp bed habitat was mapped in the subtidal zone

### 4.3 Marine Species in Burrard Inlet

#### 4.3.1 Birds

Ducks, geese, herons, shorebirds, and raptors feed and roost in mudflats, rocky shorelines, and forested areas along Burrard Inlet. As Burrard Inlet is also part of the Pacific Flyway route, it is a popular stop for many species of migratory waterfowl (BIWP 2002a). Burrard Inlet is recognized as an Important Bird Area and supports both residential and migratory bird populations, including western grebe (*Aechmophorus occidentalis*), Barrow's goldeneye (*Bucephala islandica*), and surf scoter (*Melanitta perspicillata*).

Second Narrows Bridge, also called Ironworkers Memorial Bridge, provides nesting habitat to a large, mixed breeding colony of double-crested cormorants (*Phalacrocorax auratus*) as well as pelagic cormorants (*Phalacrocorax pelagicus*). These species are expected to forage in the Project area, particularly during the nesting period.

#### 4.3.2 Fish

There are at least 80 species of finfish found in Burrard Inlet (Haggarty 2001). Key fish species found in Burrard Inlet include 5 species of Pacific salmon: pink (*Oncorhynchus gorbuscha*), chum (*O. keta*), coho (*O. kisutch*), and Chinook (*O. tshawytscha*), and steelhead (*O. mykiss*); forage fish species including northern anchovy (*Engraulis mordax*), Pacific herring (*Clupea pallasii*), Pacific sand lance (*Ammodytes hexapterus*), and surf smelt (*Hypomesus pretiosus*); and a diverse assemblage of marine species including flathead (*Hippoglossoides elassodon*) and English sole (*Parophyrus vetulus*), numerous rockfish species (*Sebastes spp.*), and ling cod (*Ophiodon elongates*).



Nearshore marine areas provide important habitat for out-migrating juvenile salmon and also serve as migration corridors or staging areas for adult salmon on their way to freshwater spawning grounds. Eleven streams and rivers in the Burrard Inlet<sup>3</sup> support Pacific salmon<sup>4</sup> spawning and rearing (Naito and Hwang 2000). Juvenile salmon migrate seaward from late winter to late summer, with the bulk of the migration expected to be between March and May. Adults typically migrate to freshwater spawning habitats within salmon-bearing watercourses from June to January.

Historically, the Indigenous communities of Burrard Inlet harvested salmon and forage fish including Pacific herring, anchovy, surf smelt, Pacific sand lance, and eulachon (*Thaleichthys pacificus*) (Tsleil-Waututh Nation 2017). Pacific herring were historically abundant, but they declined due to overfishing, and no known recent records are known of herring spawning in the Central Harbour of Burrard Inlet. Anchovy and eulachon have, likewise, undergone population decline and are not frequently observed in the Inlet (Tsleil-Waututh Nation 2017).

#### 4.3.3 Marine Mammals

Pinnipeds, including harbour seals (*Phoca vitulina*), California sea lions (*Zalophus californianus*), and Steller sea lions (*Eumetopias jubatus*), are known to occur in Burrard Inlet year-round. Cetaceans including killer whales (*Orcinus orca*) and grey whales (*Eschrichtius robustus*) are also occasional visitors to Burrard Inlet but rarely utilize the area as habitat. Nearshore habitats within the study area are unlikely to provide suitable habitat for marine mammals.

While the Project area does not support cetaceans directly, the available habitat is suitable for several key prey species. Decrease in prey abundance is of concern for cetacean populations, particularly the southern resident population of killer whales (*Orcinus orca*), which are listed as endangered (Schedule 1) and protected under the federal *Species at Risk Act*, SC 2002, c. 29, (SARA) (COSEWIC 2008).

#### 4.4 Species at Risk

A search of the BC Species and Ecosystem Explorer showed 40 species that are listed under the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) guidelines, SARA, or the BC list (Government of British Columbia 2015). Of those 40 species, only 3 potentially occur in the proposed Project location:

- Great blue heron (*Ardea Herodias fannini*)
- Marbled murrelet (*Brachyramphus marmoratus*)
- Steller sea lion

The great blue heron is provincially blue-listed under the *BC Wildlife Act*, RSBC1996, c. 488, and is a species of special concern under COSEWIC and SARA (Government of British Columbia 2013)). Great blue heron are common in coastal areas of southern BC and are known to frequent the nearby Seymour River estuary and Maplewood mudflats. Heron feed on fish in shallow waters (both freshwater and marine). The proposed Project involves the expansion of existing linear infrastructure and infilling below the HHWLT and does not overlap with any potential nesting habitats. The Project area provides a small amount of

<sup>3</sup> These are McKay Creek, Mosquito Creek, Lynn Creek, Seymour River, McCartney Creek, Windemere Creek, Mossom Creek, Noons Creek, School House Brook, Buntzen Bay Creek, and Indian River.

<sup>4</sup> These are sockeye, Chinook, coho, chum, and pink.

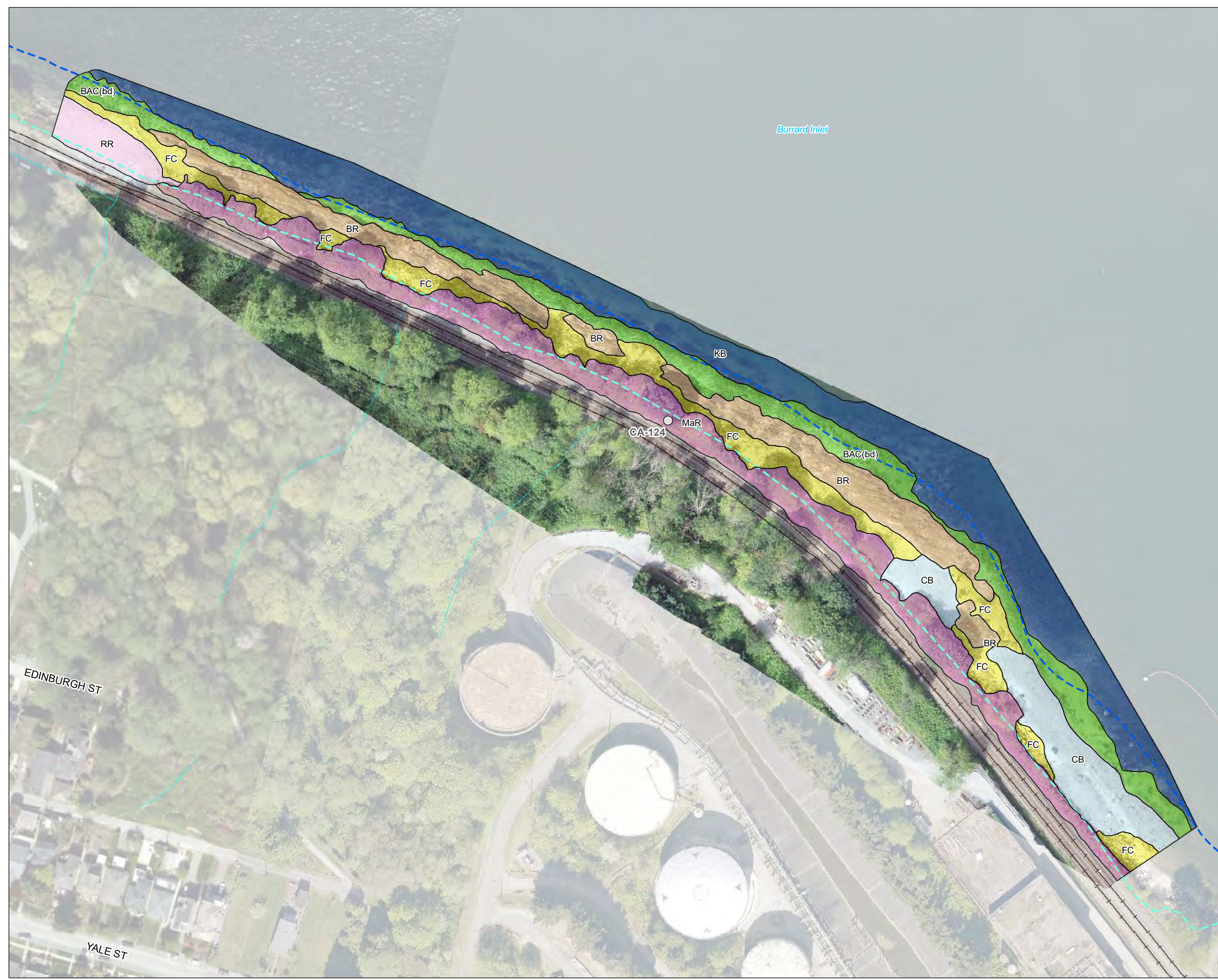
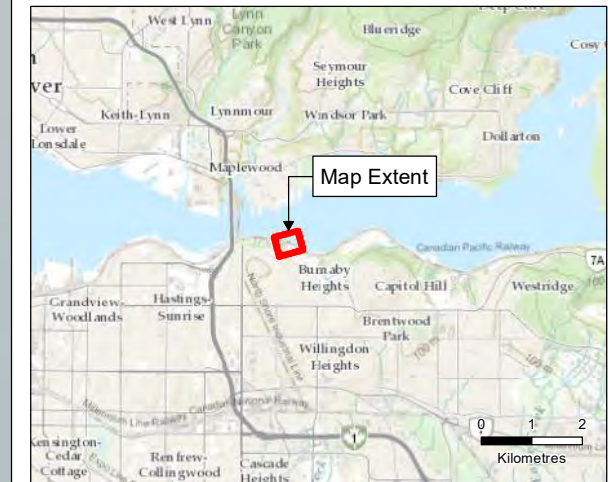
habitat for foraging, and some site avoidance during the active construction period is possible. The foraging habitat will be available again in similar quantity and quality immediately following the completion of construction. The likelihood of interaction and effect between great blue heron and the Project is therefore considered to be low.

The marbled murrelet is provincially blue-listed under the *BC Wildlife Act* and is identified as a threatened species under both COSEWIC and SARA (Government of British Columbia 2013). Marbled murrelets typically nest in old growth yellow cedar forests and make daily migrations to offshore marine waters to forage. Their marine threats include oil spills, fishing gear entanglement, and vessel traffic disrupting foraging activities. No old growth forests are present within the study area. It is unlikely that marbled murrelets will interact with the proposed Project as they are rarely seen in the Burrard Inlet and are not expected to nest anywhere near the site.

Stellar sea lions are provincially blue-listed under the *BC Wildlife Act* and are a species of special concern under COSEWIC and SARA (Government of British Columbia 2013). They are known to forage within Burrard Inlet, including at the mouth of tributaries such as the Capilano River. They feed on fish with a known dependence upon adult salmon. Marine threats to Stellar sea lions are primarily prey-centred and include competition with fisheries and environmental variability limiting prey abundance and distribution. It is anticipated that no measurable interactions will occur between Stellar sea lions and the Project.



**Habitat Mapping for  
Habitat Assessment Area West**



**Legend**

○ Mile Marker	Bed Rock - BR
Watercourse	Benthic Algae (Boulder) - BAC(bd)
High Water Mark (CHS)	Cobble - CB
Low Water Mark (CHS)	Fucus - FC
Railway	Kelp Bed - KB
	Marine Riparian Vegetation - MaR
	Rip Rap - RR

**Notes**

1. All mapped features are approximate and should be used for discussion purposes only.
2. This map is not intended to be a "stand-alone" document, but a visual aid of the information contained within the referenced Report. It is intended to be used in conjunction with the scope of services and limitations described therein.

**Sources**

- Contains information licensed under the Open Government Licence - Government of British Columbia, City of Burnaby, Metro Vancouver.
- Mile Markers and Crossings: CP, 2017
- Drome Imagery: Hemmera, 2020
- Aerial Image: ESRI World Imagery
- Inset Basemap: ESRI World Topographic

INTERNAL

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NAD 1983 UTM Zone 10N

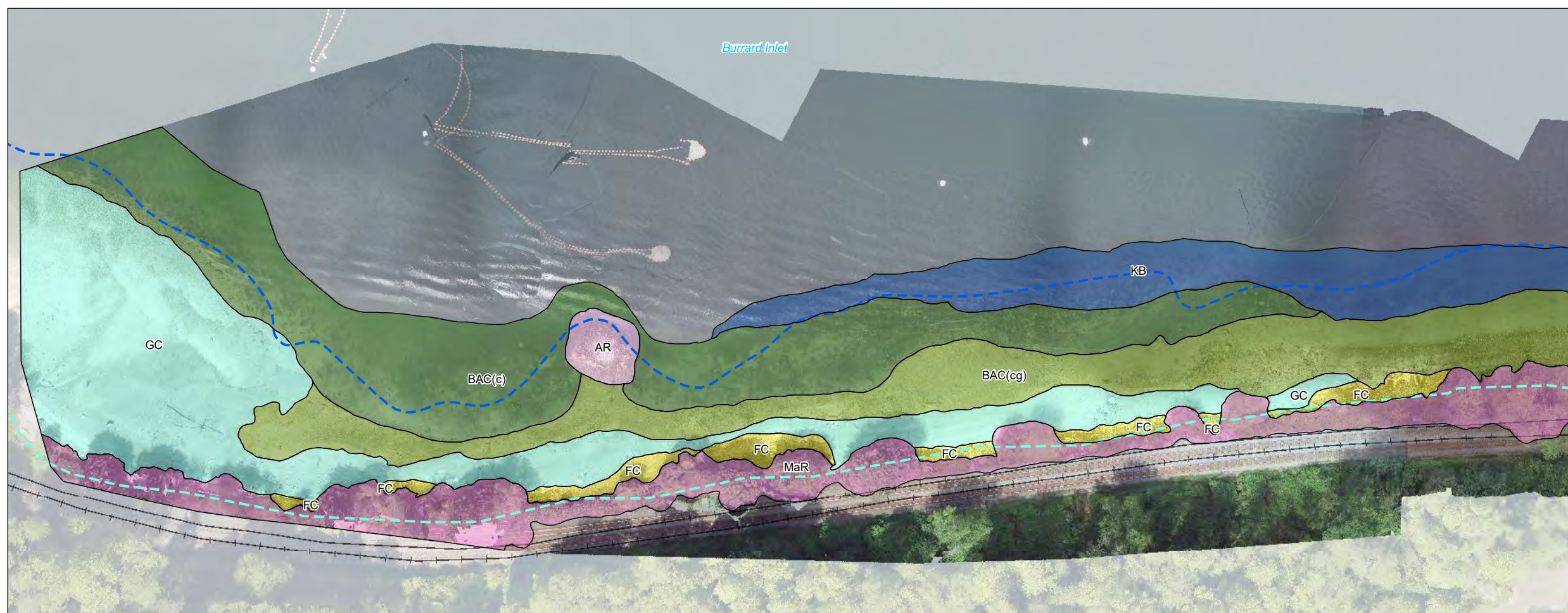
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**Habitat Mapping for  
Habitat Assessment Area East**



**Legend**

Watercourse	Artificial Reef - AR
High Water Mark (CHS)	Benthic Algae (Cobble) Gravel - BAC(cg)
Low Water Mark (CHS)	Benthic Algae (Cobble) - BAC(c)
Railway	Gravel Cobble - GC
	Fucus - FC
	Kelp Bed - KB
	Marine Riparian Vegetation - MaR

**Notes**

1. All mapped features are approximate and should be used for discussion purposes only.
2. This map is not intended to be a "stand-alone" document, but a visual aid of the information contained within the referenced Report. It is intended to be used in conjunction with the scope of services and limitations described therein.

**Sources**

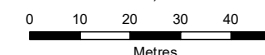
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- Inset Basemap: ESRI World Topographic

**INTERNAL**  
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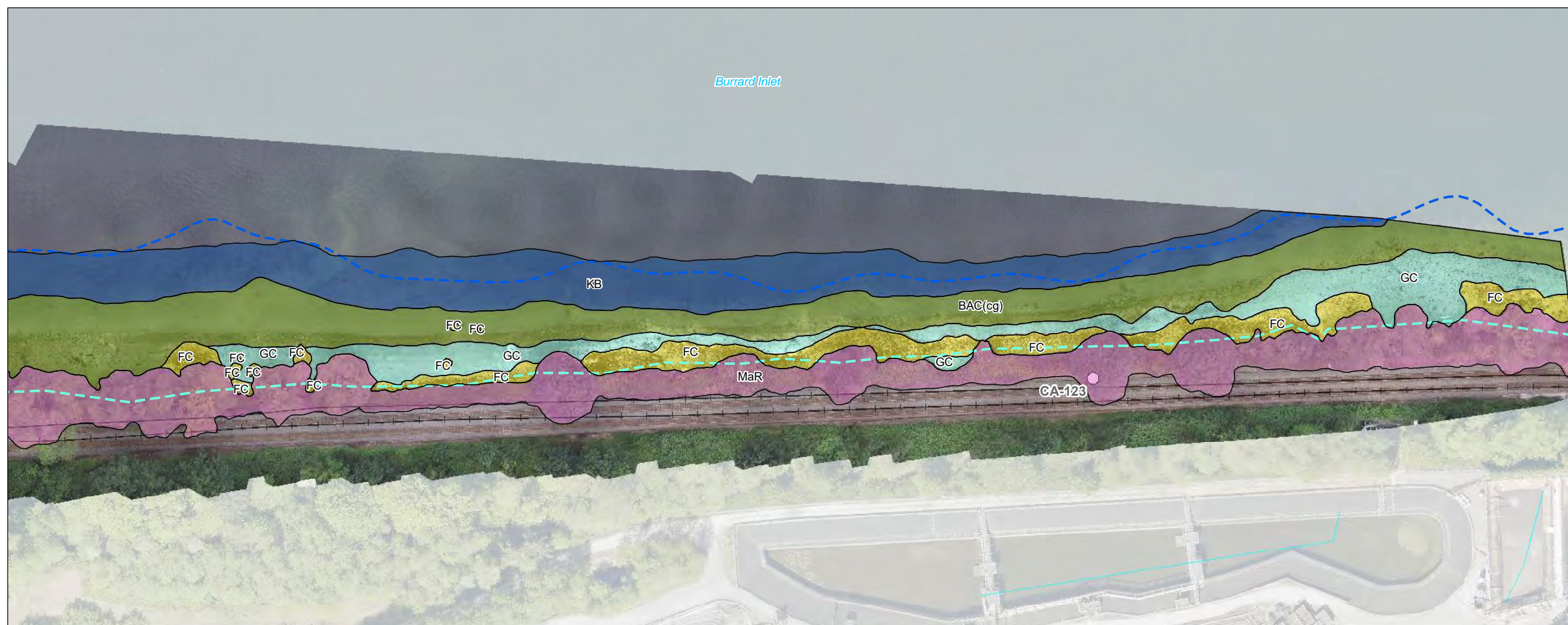
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## 5.0 PROJECT COMPONENTS AND MECHANISMS WITH POTENTIAL TO AFFECT FISH AND FISH HABITAT

This section provides an overview of the potential Project-related effects on aquatic and riparian resources, during both the construction and operation phases of the Project.

### 5.1 Aquatic Resources

This section describes potential effects on those aquatic resources that could result from proposed Project activities.

Potential effects from construction activities on aquatic resources, specifically fish and fish habitat associated within Burrard Inlet, have been defined using DFO pathways of effects<sup>5</sup>. These pathways can be used to evaluate Project-related activities with respect to the type of cause-effect relationships that are known to exist, including the mechanisms by which stressors can ultimately lead to effects on fish and fish habitat, and appropriate management actions to either avoid or mitigate those effects (Government of Canada 2006).

Potential pathways of effect that may be expected to occur as a result of the proposed Project are summarized in **Table 5.1**. The table rows list the different land-based or in-water activities identified by DFO as potential sources of effects on fish and fish habitat, which might occur as a result of the proposed Project and therefore have potential to result in an adverse effect in the absence of mitigation. The columns in this table describe potential adverse effects to fish and fish habitat.

This discussion of environmental effect pathways is followed by a description of avoidance and mitigation measures in **Section 5.0**. In accordance with *Fisheries Act* requirements, Hemmera has assessed the potential for the Project to result in notable residual effects to fish that may be defined as a HADD, as described in **Section 7.0**.

**Table 5.1 Project Assessment using DFOs Defined Activities and Timing of Potential Effects**

Project Activities	Potential Sources of Effects on Fish and Fish Habitat			
	Change in Sediment Concentrations	Change in Contaminant Concentrations	Change in Habitat Structure and Cover	Mortality of Fish
<b>Land-based Activities</b>				
Use of industrial equipment	✓	✓	-	✓
Vegetation clearing	✓	-	✓	-
Grading	✓	-	✓	-
<b>In-water Activities</b>				
Placement of materials and structures in water	✓	✓	✓	✓
Use of industrial equipment	✓	✓	-	✓

<sup>5</sup> Adapted from DFO guidance, available online (DFO 2013).

### 5.1.1 Changes in Sediment Concentrations

Land-based and in-water construction activities, including the use of industrial equipment, vegetation clearing, grading, dredging, and the placement of material below the HWL, have the potential to release sediment-laden water into Burrard Inlet. Increased concentration of sediments may affect water quality and negatively affect fish survival and productivity by decreasing visibility, damaging fish gills, altering species interactions (e.g., increasing or decreasing predation rates), and reducing habitat quality (Government of Canada 2018c).

### 5.1.2 Changes in Contaminant Concentrations

The use of construction equipment near and in Burrard Inlet may potentially result in the release of contaminants into the aquatic environment due to accidental spills. Changes in contaminant concentrations have the potential to cause fish mortality, affect growth or reproductive success, and contaminate underlying substrates, leading to avoidance and injury to marine invertebrates and fish (Government of Canada 2018c).

### 5.1.3 Changes in Habitat Structure and Cover

An estimated 357 m<sup>2</sup> of lower-value riparian vegetation that has colonized the area seaward of the existing track will be removed by Project activities.

Approximately 10,957 m<sup>2</sup> of marine habitat will be affected by Project activities (see **Figures 5a and 5b**). Of this, 4,195 m<sup>2</sup> of the intertidal habitat will be destroyed through conversion to backshore (upland) area. A further 6,783 m<sup>2</sup> will be permanently altered to intertidal habitat comprising a 2:1 riprap slope on the outer (seaward) side of the new infill. Subtidal habitat removed by Project activities is expected to total 6,761 m<sup>2</sup>, composed of 5,798 m<sup>2</sup> of benthic algal community and 963 m<sup>2</sup> of kelp bed. A further 4,029 m<sup>2</sup> of intertidal habitat will be altered beyond the permanent infill area (grading structure). Other Project-related activities will result in some additional permanent alteration of approximately 5,028 m<sup>2</sup> of marine riparian habitats and 2,706 m<sup>2</sup> in the subtidal zone.

### 5.1.4 Incidental Injury or Mortality of Fish

Direct injury or mortality of fish (including eggs, ova, and larvae) may result from physical disruption from industrial equipment in fish-bearing waters. For example, Dungeness or red rock crabs could be crushed during fill placement.

Increases in suspended solids can degrade surface water quality. Total suspended solids in the marine environment can affect fish and benthic communities. An elevated load of suspended solids in surface water can damage fish gills, potentially causing laceration and infection or reducing the efficiency of gas exchange across the gill membrane. Elevated rates of sediment precipitation on the seabed can smother benthic communities, particularly small interstitial invertebrates or larval and juvenile forms of larger animals.

## 6.0 MEASURES TO AVOID OR MITIGATE EFFECTS ON FISH, HABITAT, AND SPECIES AT RISK

DFOs Fish and Fish Habitat Protection Policy Statement outlines a hierarchy of measures and standards for fisheries protection that are to: (1) avoid, (2) mitigate, and/or (3) offset the death of fish and harmful effects on fish habitat caused by the proposed work, undertaking, or activity (Government of Canada 2019c). The first, and preferred measure, is to avoid Project-related effects. Where avoidance cannot be achieved, then mitigation measures will be implemented to reduce potential effects such as death of fish or HADD as guided by DFOs Standard General Avoidance and Mitigation Measures (Government of Canada 2019d). Project-related construction and operation will be completed following accepted industry standards, BMPs, and applicable regulations and standards.

The following guidance documents have been considered in the development of these work practices:

- Land Development Guidelines for the Protection of Aquatic Habitat (Chilibeck et al. 1992)
- Standards and Best Practices for Instream Works (Government of British Columbia 2004)
- Measures to Avoid Causing Harm to Fish and Fish Habitat (Government of Canada 2013)
- Canadian Water Quality Guidelines for the Protection of Aquatic Life (Canadian Council of Ministers of the Environment (CCME) 1999)
- BC Approved Water Quality Guidelines: Aquatic Life, Wildlife and Agriculture (Government of BC 2019)
- A Field Guide to Fuel Handling, Transportation and Storage (Government of British Columbia 2002a)
- Summary of Environmental Standards and Guidelines for Fuel Handling, Transportation, and Storage (Hollenberg 1995)
- BC Guidelines for Industry Emergency Response Plans (Government of British Columbia 2002b).

A site-specific Construction Environmental Management Plan will be created at a later date, based on the mitigation measures described in the sections that follow.

### 6.1 Avoidance Measures

Avoidance/prevention measures for potential Project-related effects were considered prior to the development of mitigation strategies. Where avoidance of Project effects is not possible or practical, mitigation measures and BMPs are identified for each of the potential effects. Avoidance measures considered during the planning phase of the Project include site selection, design, and timing.

#### 6.1.1 Construction Timing

To the greatest extent practicable, works, undertakings, and activities required for the Project will be scheduled to occur during the fisheries window of least risk for the Lower Mainland region (Government of Canada 2019b). The recommended work window for the Project area is **August 16 to February 28**.

The reduced-risk timing windows for fish species with the potential to be present in the watercourses within the Project area are as follows (Government of British Columbia 2006b):

- Rainbow trout, steelhead, and cutthroat trout – **August 1 to October 31**
- Dolly Varden – **June 16 to August 31**
- Kokanee – **June 1 to August 15**
- Pacific salmon – **July 16 to September 15.**

Any vegetation clearing activities should be undertaken outside the breeding-bird window for songbirds and raptors to avoid actively nesting birds. The nesting period for songbirds, raptors, and waterfowl in the Lower Mainland and Fraser Valley is late March to mid-August (Government of Canada 2018a).

## **6.2 Mitigation Measures**

Residual effects on fish habitat can be avoided or reduced by implementing site-specific mitigation measures and BMPs (**Table 6.1**).

The recommended mitigation measures were developed based on the current understanding of the Project scope and timing as well as the applicable Project activities (**Section 2.2**) and DFO Pathways of Effects (Government of Canada 2018c).



**Table 6.1 Measures to Mitigate the Death of Fish and the Harmful Alteration, Disruption, or Destruction of Fish Habitat**

Pathway of Effect	Associated Project Activities	Mitigation Measures
<p>Change in Sediment Concentrations</p>	<ul style="list-style-type: none"> <li>• Use of industrial equipment</li> <li>• Placement of materials and structures in water</li> <li>• Grading</li> <li>• Vegetation clearing</li> </ul>	<ul style="list-style-type: none"> <li>• A Dust Control (DC) Plan will be developed and implemented by the Contractor:                             <ul style="list-style-type: none"> <li>▫ The DC Plan will assign implementation and monitoring roles.</li> <li>▫ Onsite personnel will review the DC Plan, understand their roles and responsibilities, and be properly trained and equipped to implement the DC Plan.</li> <li>▫ The DC Plan will require the following:                                     <ul style="list-style-type: none"> <li>▪ Schedule work to avoid periods of extremely dry or windy conditions.</li> <li>▪ Employ good housekeeping and dust suppression techniques to reduce airborne dust and prevent off-site migration.</li> <li>▪ Cover all stockpiled materials (e.g., excavated soils) at all times with an appropriate, impermeable material to prevent dust generation.</li> <li>▪ Use only water as a dust suppressant, with appropriate erosion and sediment control measures in place (discussed below).</li> <li>▪ Do not permit sediment, sediment-laden waters, or other deleterious substances to enter Burrard Inlet during the Project.</li> </ul> </li> </ul> </li> <li>• A Water Quality Management (WQM) Plan will be developed and implemented by the Contractor. The WQM Plan will assign implementation and monitoring roles and will require the Contractor to:                             <ul style="list-style-type: none"> <li>▫ Ensure that site personnel have reviewed the WQM Plan, understand their roles and responsibilities, and are properly trained and equipped to conduct WQM activities.</li> <li>▫ Ensure that stockpiled materials in the intertidal zone are appropriately covered during periods of precipitation.</li> <li>▫ Place all material below the HWL in a controlled manner, with the placement to be monitored and adjusted as required in order to maintain reasonable levels of turbidity (outlined below), as determined by the Environmental Monitor (EM).</li> <li>▫ Ensure that silt curtains and erosion sediment control measures are available onsite as needed to ensure that sediment-laden water does not enter the marine environment.</li> </ul> </li> <li>• The WQM Plan will require the Project to adhere to the following water quality guidelines for turbidity:                             <ul style="list-style-type: none"> <li>▫ During clear flow periods, induced turbidity should not exceed background levels by more than 8 NTUs during any 24-hour period, with hourly sampling preferred.</li> <li>▫ During turbid flow periods, induced turbidity should not exceed background levels by more than 5 NTU at any time when background turbidity is between 8 NTU and 50 NTU. When background exceeds 50 NTU, turbidity should not be increased by more than 10 per cent of the measured background level at any one time (Singleton 2001).</li> </ul> </li> <li>• The WQM Plan will describe the water quality monitoring that will be undertaken to ensure the above guidelines are met. The monitoring will include the following:                             <ul style="list-style-type: none"> <li>▫ Monitor water quality for any construction activity that may negatively affect water quality.</li> <li>▫ Have the EM establish sampling sites prior to the commencement of water quality monitoring or any works requiring water quality monitoring.</li> <li>▫ Establish turbidity sampling sites in an arc 30 m from the turbidity curtain if used, or from the construction activity if a curtain is not used.</li> <li>▫ Collect samples a minimum of twice a day during the first 2 days of the construction activity requiring water quality monitoring: prior to start-up and mid-morning during normal construction activities.</li> <li>▫ If construction is observed to temporarily increase turbidity in the vicinity of construction, permit the EM to collect additional samples at an increased rate (e.g., every 2 hours) for the duration of the construction activity, or until the turbidity levels return to near background.</li> <li>▫ Collect samples from approximately mid-water depth to avoid contaminating samples with surface detritus (dust, pollen, etc.) or with substrate (silt, sand). Where not feasible to collect from mid-water, the EM will use their discretion to collect samples in accordance with the above criteria.</li> </ul> </li> </ul>

Pathway of Effect	Associated Project Activities	Mitigation Measures
<p>Change in Sediment Concentrations</p>	<ul style="list-style-type: none"> <li>• Use of industrial equipment</li> <li>• Placement of materials and structures in water</li> <li>• Grading</li> <li>• Vegetation clearing</li> </ul>	<ul style="list-style-type: none"> <li>• The WQM Plan will include the following contingency measures for the EM to implement if water quality guideline levels are exceeded:                             <ul style="list-style-type: none"> <li>▫ Communicate the results of the ongoing WQM regularly with the Contractor. Immediately communicate any spike or exceedance of water quality guidelines.</li> <li>▫ If a turbidity exceedance is detected, and/or a visual turbidity plume is detected, collect additional samples from all sampling locations and, if necessary, from the middle of the plume and as close to the source as possible within all applicable safety limits.</li> <li>▫ If an exceedance is detected, require the relevant construction activity to stop immediately. Collect samples and measure water quality parameters in situ until all sampling locations are within guideline levels.</li> <li>▫ Prior to restarting construction, work with the Contractor to identify the reason for the exceedance and implement additional mitigation measures that may include but are not limited to deploying sediment curtains and modifying the rate of work.</li> </ul> </li> <li>• A Sediment and Erosion Control (SEC) Plan will be developed and implemented by the Contractor. This plan will:                             <ul style="list-style-type: none"> <li>▫ Assign implementation and monitoring roles.</li> <li>▫ Require site personnel to review the SEC Plan, understand their roles and responsibilities, and be properly trained and equipped to conduct spill response activities.</li> </ul> </li> <li>• Implement control measures for sediment-laden water. The SEC Plan will contain the following mitigation requirements:                             <ul style="list-style-type: none"> <li>▫ Use temporary drainage measures as necessary to keep excavations and site free from water.</li> <li>▫ Restore to the original gradient all upland areas disturbed during construction.</li> <li>▫ If necessary, protect all upland disturbed areas with appropriate erosion control blankets, or hydroseed.</li> <li>▫ Locate and secure barges/vessels and other water-borne equipment in such a way as to prevent grounding onto intertidal foreshore or the seabed. Ensure that barges, vessels, and water-borne equipment will not ground on lowest low-water tides.</li> <li>▫ Minimize the use of barge stabilizing spuds to mitigate effects on the foreshore and seabed. Use anchors instead of spuds whenever practical.</li> <li>▫ Reduce vessel speeds to an appropriate speed limit required to eliminate excess wake along the shoreline and disruption of seabed sediments.</li> <li>▫ Minimize disturbance to the intertidal zone :</li> <li>▫ Minimize the area of vegetation clearing will be to the extent possible. When removing invasive species, minimize excessive soil disturbance to minimize new introductions.</li> <li>▫ Clearly delineate the limits of construction activities and place appropriate buffers around any sensitive environmental features prior to vegetation clearing.</li> <li>▫ For all cleared areas along roadways that require maintained sightlines, replant promptly with high-quality native seed and low-growing plants to reduce weed establishment.</li> <li>▫ Prevent wheels and tracks of land-based equipment from entering the water at any time. If working in the intertidal zone, this will require careful monitoring of the change in tide levels.</li> <li>▫ Operate marine vessels to avoid seabed grounding and propeller wash. Propeller wash can be avoided by operating vessels in water with a minimum clearance of 1.5 m between the propeller and the seabed.</li> <li>▫ Carry out all physical activities in a manner that prevents induced sedimentation of foreshore and near shore areas and induced turbidity of local waters, and the release of sediment, sediment-laden waters, and turbid waters to the aquatic environment.</li> <li>▫ Ensure that equipment operators are properly trained, and operate equipment based on best industry practices, which include utilizing techniques that minimize the re-suspension of sediments in the water column.</li> </ul> </li> </ul>

Pathway of Effect	Associated Project Activities	Mitigation Measures
		<ul style="list-style-type: none"> <li>▫ Cover exposed areas to prevent soil erosion and sediment runoff, particularly bare slopes which can be covered with coco-matting or mulch. Avoid clearing during heavy rainfall when sediment runoff potential is greatest.</li> <li>▫ Utilize silt fencing, hay bales, geotextile fabric or other runoff management systems to control and contain soil erosion and sediment runoff from entering the marine environment.</li> <li>▫ Establish site entrances and implement measures to prevent tracking of soil/sediment to the riparian and high-water mark areas to prevent introduction to the marine environment.</li> <li>▫ Operate and manoeuvre barges and any tending vessels in such a way as to prevent disturbance to seabed materials, particularly areas adjacent to during dredging activities, which could otherwise result from grounding of barges and re-suspension of solids from propeller wash. Propeller wash can be minimized by operating vessels in water with a minimum clearance of 1.5 m between the propeller and the seabed.</li> <li>▫ Control or prevent from occurring sediment runoff on material supply barges. Barges should not be washed or hosed down to remove residual supply materials (i.e., gravel/sand for beach construction), as this could result in sedimentation/turbidity of the water column from finer fractions and the potential for toxic deleterious materials (e.g., residues from oils, fuel etc.) to enter the marine environment.</li> <li>▫ Control or prevent from occurring sediment runoff on temporary pad extension.</li> <li>▫ Monitor the continued effectiveness of all implemented measures and replace, repair, or improve as needed. Continually monitor the site for new sources of soil erosion and sediment runoff, and implement measures to control runoff and erosion, as needed. Leave control measures in place until the affected work areas are stabilized and there is no longer a risk of sediment runoff, sedimentation, or soil erosion.</li> </ul>
<p>Change in Contaminant Concentrations</p>	<ul style="list-style-type: none"> <li>• Use of industrial equipment</li> <li>• Placement of materials and structures in water</li> </ul>	<ul style="list-style-type: none"> <li>• A Spill Prevention and Response (SPR) Plan will be developed by the Contractor’s Qualified Person and implemented by the Contractor:             <ul style="list-style-type: none"> <li>▫ The SPR Plan will assign implementation and monitoring roles and will:                 <ul style="list-style-type: none"> <li>▪ Ensure site personnel have reviewed the SPR Plan, understand their roles and responsibilities, and are properly trained and equipped to conduct spill response activities.</li> <li>▪ Include a list of spill response equipment that will be present onsite.</li> </ul> </li> <li>▫ The SPR Plan will include the following specific measures that will be undertaken to prevent and respond to spills:                 <ul style="list-style-type: none"> <li>▪ Ensure all equipment, machinery, vessels and vehicles brought onsite are clean, free of leaks, excess oil, and grease, and in good working order.</li> <li>▪ Check all equipment, machinery, vessels and vehicles every morning for leaks and ensure they are maintained in good working order.</li> <li>▪ When practical, if hydraulic machinery is required, use environmentally sensitive hydraulic fluids that are non-toxic to aquatic life and are readily or inherently biodegradable.</li> <li>▪ Limit refuelling, fuel stockpiling and maintenance of equipment to designated areas on level, impermeable surfaces outside the riparian zone and waterways and at least 50 m away from any drainage or surface water features.</li> <li>▪ Ensure all refuelling occurs with funnels, pads, and drip pans in place.</li> <li>▪ Store fuels, lubricants and chemicals appropriately onsite, with proper controls to prevent the release of deleterious substances, in a designated area at least 30 m away from surface water features or surface water drainage.</li> <li>▪ Place properly sized oil drip pans under all equipment and vehicles left onsite.</li> <li>▪ Identify high-risk locations where spills are probable and maintain spill kits, capable of handling 110% of the largest potential spill through the duration of the Project, at these locations.</li> <li>▪ Locate personal protective equipment at the top of the spill kit to ensure easy access for the spill responder.</li> <li>▪ Keep spill kits closed with a safety seal affixed to indicate if the kit has been used or tampered with.</li> <li>▪ Respond immediately to all spills in accordance with the SPR Plan.</li> </ul> </li> </ul> </li> </ul>



Pathway of Effect	Associated Project Activities	Mitigation Measures
		<ul style="list-style-type: none"> <li>• The SPR Plan will require that in the event of a release of any deleterious substances (i.e., hydrocarbon products) onsite, the Contractor implement the following procedures:               <ul style="list-style-type: none"> <li>▫ Ensure safety                   <ul style="list-style-type: none"> <li>▪ Ensure that site personnel are safe from the release, as well as the public, equipment, property, and environment are at no other immediate risk due to the release.</li> <li>▪ Wear appropriate personal protective equipment to manage the release.</li> <li>▪ Take a step back and re-evaluate the situation. Do not rush, and ensure you are adequately protected before entering a spill area. Make sure you have the appropriate knowledge (i.e., check Material Safety Data Sheet for spilled product).</li> <li>▪ Notify people in the immediate vicinity of the incident.</li> <li>▪ Ensure there are no ignition sources in the area, if the spill is a flammable material.</li> </ul> </li> <li>▫ Remove source                   <ul style="list-style-type: none"> <li>▪ Act quickly to reduce the amount of product spilled and the environmental effect where possible.</li> <li>▪ Close valves, shut off equipment, or plug any holes/leaks as appropriate.</li> <li>▪ Stop the flow at its source.</li> </ul> </li> <li>▫ Secure the area                   <ul style="list-style-type: none"> <li>▪ Limit access to the spill area.</li> <li>▪ Prevent unauthorized entry onto the site.</li> </ul> </li> <li>▫ Contain the spill                   <ul style="list-style-type: none"> <li>▪ Prevent migration of the spill off-site, into any water bodies, or into any drainage structures such as storm sewers.</li> <li>▪ Use sorbent materials (i.e., booms or pads) to contain the spill, or where appropriate, soil berms to contain it.</li> <li>▪ Locate spill kits onsite within 100 m of any hazardous material storage area and keep them readily accessible in the event that they are needed.</li> <li>▪ If necessary, use a dyke or any other method to prevent the migration of the material.</li> <li>▪ Attempt to minimize the contamination onsite.</li> </ul> </li> <li>▫ Notify and report                   <ul style="list-style-type: none"> <li>▪ Notify the appropriate CP internal managers of the spill.</li> <li>▪ Notify the CP Emergency Response Network (1.800.716.9132) of the spill.</li> <li>▪ Notify the Provincial Emergency Coordination Centre (1.800.663.3456), as required (see table below).</li> <li>▪ Provide details of the spill to any other external agency, including engaged Indigenous communities, once the spill has been contained or stabilized.</li> </ul> </li> <li>▫ Complete the internal incident report.</li> </ul> </li> </ul>

Pathway of Effect	Associated Project Activities	Mitigation Measures			
		<b>Spill Prevention and Response Plan – Spill Reporting Matrix</b>			
		Substance	Quantity <sup>1</sup>	External Reporting Requirements	CP Internal Reporting Requirements
		Any Spill	Any amount in aquatic habitat	Emergency Management BC (EMBC) DFO and BC Ministry of Environment and Climate Change Strategy (ENV)	Environmental Incident Report (EIR)
		Oil and Waste Oil	Greater than (>) 100 litres	EMBC	EIR
			Any amount off BCTC/BC Hydro Property	ENV and Local Authority	EIR
		Oil with >50 ppm PCB (PCB Wastes)	>25 kilograms or litres	EMBC	EIR
		Flammable or Non-flammable Gas	10 kilograms	EMBC	EIR
		Toxic or Corrosive Waste	>5 kilograms or litres	EMBC	EIR
		Hazardous Waste containing PAHs	>5 kilograms or litres	EMBC	EIR
		Pesticides and Herbicides	5 kilograms or litres	EMBC	EIR
		<b>Notes:</b> <sup>1</sup> Amounts are based on Spill Reporting Regulation (BC Reg. 263/90) of the <i>Environmental Management Act</i> . ppm = parts per million; PCB = polychlorinated biphenyls.			
		<ul style="list-style-type: none"> <li>▫ Submit the following information to CP and relevant provincial and federal reporting vectors within one day of a spill incident:                             <ul style="list-style-type: none"> <li>▪ Date and time of spill, including occurrence, discovery, and cleanup commencement; type of material spilled; and Transport of Dangerous Goods classification</li> <li>▪ Spill surface (gravel, water, pavement, shop floor)</li> <li>▪ Quantity of material spilled and quantity recovered, in kilograms or litres</li> <li>▪ Source or origin of spill</li> <li>▪ Cause of spill (description of incident)</li> <li>▪ Corrective action taken and action plan to prevent a subsequent spill</li> <li>▪ Human impacts</li> <li>▪ Environmental impacts (ground, water, vegetation, wildlife)</li> <li>▪ Weather conditions at the time of the incident</li> <li>▪ Agencies or authorities notified or involved</li> <li>▪ Media interest.</li> </ul> </li> </ul>			

Pathway of Effect	Associated Project Activities	Mitigation Measures
<p>Change in Contaminant Concentrations</p>	<ul style="list-style-type: none"> <li>• Use of industrial equipment</li> <li>• Placement of materials and structures in water</li> </ul>	<ul style="list-style-type: none"> <li>• The Contractor will be required to adhere to the following additional mitigations:                             <ul style="list-style-type: none"> <li>▫ Sample and analyze all water to be removed from the site at a minimum for polycyclic aromatic hydrocarbons, total metals, pH, salinity, and total suspended solids. Compare the results to CCME Canadian Environmental Quality Guidelines, BC Approved Water Quality Guidelines, and any other applicable guidelines and standards.</li> <li>▫ If using unprotected concrete above the HWL, put in place appropriate control measures to ensure that concrete leachate or uncured concrete does not reach water. Include these methods in the WQM Plan, allowing for inclusion of turbidity curtains and berms.</li> <li>▫ In the WQM Plan, require that local pH not drop below 4.5 or exceed 9.5 (Government of British Columbia 2017).</li> <li>▫ Collect and dispose of refuse and debris related to the Work at approved disposal facilities in compliance with laws and requirements of all authorities having jurisdiction.</li> <li>▫ Not dump, burn, bury, or allow others under the Contractor’s control to dump, burn, or bury construction wastes and refuse associated with the Work. Should refuse or construction wastes related to the Work be dumped, the Contractor will immediately act to clean up and remove the waste material to an approved location.</li> <li>▫ In the Contractor’s work area, have a recycling and waste management program in place. Among other things, have clearly labelled garbage bins with lids and recycling containers available for food waste and recyclable office waste. Arrange for the placement of garbage receptacles and recycling containers at key locations within the Work site, such as in the vicinity of the laydown area. Provide garbage bins kept outside with lids sufficient to keep wildlife from accessing the waste inside.</li> <li>▫ Establish regular cleanup and disposal programs to prevent the unnecessary accumulation of excessive construction waste and refuse.</li> <li>▫ Dispose of hazardous materials in accordance with the law and the requirements of all authorities having jurisdiction.</li> <li>▫ Should the onsite storage of hazardous materials such as gasoline or oils be required, put in place secondary containment capable of holding at least 110% of all hazardous materials stored within the storage.</li> <li>▫ Maintain current Material Safety Data Sheets and an inventory for all controlled substances used, stored, and handled onsite associated with Project activities.</li> <li>▫ Designate an area, as required, for the transfer or temporary storage of hazardous materials and wastes. Clearly label and control the area in accordance with Workplace Hazardous Materials Information System and other statutes.</li> <li>▫ Where construction activities involve the handling, storage, and removal of hazardous waste, maintain the following records:                                     <ul style="list-style-type: none"> <li>▪ Inventories of types and quantities of hazardous waste generated, stored, or removed</li> <li>▪ Manifests identifying hazardous waste haulers and disposal destinations</li> <li>▪ Disposal certification documents.</li> </ul> </li> <li>▫ Train personnel in the handling and transportation of dangerous goods and controlled substances.</li> <li>▫ Carry out intertidal work during periods when the site is not wetted by the tide. Do not allow machinery to enter the water during intertidal work under any conditions. Closely track water levels during construction and if work runs behind schedule, remove equipment from the intertidal zone.                                     <ul style="list-style-type: none"> <li>▪ Train onsite personnel to stop work if suspected contamination (e.g., hydrocarbon sheen, odour, wood waste, metal debris) is encountered during Project implementation. Require onsite personnel to immediately notify the Environmental Manager. Do not disturb contaminated until a Qualified Environmental Professional has assessed the situation and developed a management plan that has been approved by the Environmental Manager and CP.</li> </ul> </li> </ul> </li> </ul>



Pathway of Effect	Associated Project Activities	Mitigation Measures
Change in Habitat Structure and Function	<ul style="list-style-type: none"> <li>• Grading</li> <li>• Placement of materials and structures in water</li> <li>• Vegetation clearing</li> </ul>	<ul style="list-style-type: none"> <li>• The Contractor will be required to apply the following mitigation measures related to habitat structure and function:                             <ul style="list-style-type: none"> <li>▫ Restore to the original gradient all upland areas disturbed during construction.</li> <li>▫ If necessary, protect all upland disturbed areas with appropriate erosion control blankets, or hydroseed them.</li> <li>▫ Conduct any seeding and replanting in accordance detailed in DFOs riparian revegetation guidance (Government of Canada 1995).</li> <li>▫ Clear no vegetation for any laydown or parking of vehicles or machinery.</li> <li>▫ Re-contour all disturbed areas and spoil piles to blend in with the existing landscape.</li> <li>▫ Prior to affecting any vegetation, have an appropriately qualified professional check all areas of disturbance for the presence of invasive vegetation. Where invasive vegetation is present, a site-specific Invasive Species Management Plan will be required. This plan should include mitigation measures for working in and around areas of invasive vegetation.</li> <li>▫ Minimize the area of vegetation clearing to the extent possible. Minimize excessive soil disturbance when removing invasive species to minimize new introductions.</li> <li>▫ Take appropriate steps to avoid the spread of invasive species (e.g., Himalayan blackberry) onsite:                                     <ul style="list-style-type: none"> <li>▪ Cleared vegetation toward patches of invasive species to prevent spread into un-infested areas.</li> <li>▪ Dispose of all above-ground parts of invasive species and any excavated soil that may contain roots at an approved landfill; do not compost or leave onsite.</li> </ul> </li> <li>▫ In riparian areas, include large tree species in restoration plans, as appropriate, to support long-term recruitment of large woody debris.</li> <li>▫ Schedule seeding and planting to allow establishment before the end of the growing season.</li> <li>▫ For all cleared areas along roadways that require maintained sightlines, replant promptly with high-quality native seed and low-growing plants to reduce weed establishment.                                     <ul style="list-style-type: none"> <li>▪ Position barges and water-borne construction equipment with enough clearance to prevent damage to fish habitat.</li> </ul> </li> </ul> </li> </ul>
Fish Injury or Mortality	<ul style="list-style-type: none"> <li>• Use of industrial equipment</li> <li>• Placement of materials or structures in water</li> </ul>	<ul style="list-style-type: none"> <li>• The Contractor will be required to apply the following mitigation measures related to fish injury or mortality:                             <ul style="list-style-type: none"> <li>▫ Where possible, site barges away from sensitive fish habitat (e.g., hard substrate). If spuds are required to hold the barge in place, avoid sensitive habitats. If barge spuds are required to ground in sensitive habitat types, assess the spud grounding area prior to deployment via SCUBA, drop cam or other similar sensing method. Do not ground barges during construction.</li> <li>▫ Properly maintain equipment and machinery to minimize unnecessary underwater noise pollution.</li> <li>▫ Require vessels to follow operation requirements when close to marine mammals IAW the Marine Mammal Regulations, the Interim Order for the Protection of the Killer Whale (<i>Orcinus orca</i>) in the Waters of Southern British Columbia, 2020, DFOs Notice to Mariners and Guidance for Watching Marine Wildlife (Government of Canada 2018b, 2020; Transport Canada 2020).</li> <li>▫ Require vessels to adhere to approach distance requirements identified in the Marine Mammal Regulations, 2018 (Government of Canada 2018b) and the Interim Order for the Protection of the Killer Whale (<i>Orcinus orca</i>) in the Waters of Southern British Columbia (Transport Canada 2020), specifically:                                     <ul style="list-style-type: none"> <li>▪ 100 m away from any whale, dolphin, and/or porpoise</li> <li>▪ 200 m away from any whale, dolphin, and/or porpoise if in resting position or with their calf</li> <li>▪ 400 m away from any killer whale when within waters identified in Schedule 1 of the Interim Order (which includes the Project footprint)</li> <li>▪ 200 m away from any killer whale when outside waters identified in Schedule 1 of the Interim Order.</li> </ul> </li> </ul> </li> </ul>

Pathway of Effect	Associated Project Activities	Mitigation Measures
		<ul style="list-style-type: none"> <li>▫ Require vessels to reduce speed to less than 7 knots when within 1,000 m of the nearest marine mammal (Government of Canada 2020), to reduce engine noise and vessel wake. Avoid abrupt course changes.</li> <li>▫ Turn off echosounders when not in use.</li> <li>▫ Conduct all construction activities that take place below the HWL under the supervision of a trained Marine Mammal Observer (MMO). The MMO and EM roles can be fulfilled by the same individual.             <ul style="list-style-type: none"> <li>▪ During all subtidal works, require the MMO to scan the work area before and during ongoing works and document the presence, number, and behaviour of marine mammals in the area.</li> <li>▪ If marine mammals appear disturbed, require the MMO to advise the Contractor to stop or modify construction activities until the mammals have cleared the area.</li> <li>▪ Keep a daily log of MMO activities and summarize it in the Environmental Monitoring Report.</li> </ul> </li> <li>▫ Require vessels to avoid approaching within 100 m of a marine mammal in the water or a seal / sea lion haul out. If seals or sea lions are encountered, reduce boat speed, minimize wake, wash and noise, and then slowly pass without stopping. Avoid sudden changes in speed and direction.</li> <li>▫ Pay attention and move away, slowly and cautiously, at the first sign of marine mammal disturbance or agitation.</li> <li>▫ Do not disturb, move, feed or touch any marine wildlife, including seal pups.</li> <li>▫ Immediately report emergency collisions with marine mammals, or a sighting of an entangled or injured marine mammal, to Coast Guard (VHF Channel 16) or Whale Emergency Network (1-800-465-4336). Additionally, contact Royal Canadian Navy Maritime Forces Pacific Formation (MARPAF) Formation Safety and Environment (FSE) for all marine mammal issues.</li> <li>▫ Prior to the salvage of any marine organisms, obtain the appropriate permits (e.g., scientific collection licence and SARA salvage permit).</li> <li>▫ Salvage marine invertebrates from the intertidal work corridor prior to and during construction. Return or replace them in similar habitat (same tidal height and orientation).</li> <li>▫ Require that the following information be recorded by the EM and reported to DFO:             <ul style="list-style-type: none"> <li>▪ Date, capture methods, number, and location of each salvage effort</li> <li>▪ Number of each species captured during each salvage effort</li> <li>▪ Locations at which salvaged marine life are released</li> <li>▪ Total number of each marine life species released during all salvage efforts.</li> </ul> </li> <li>▫ If trapped fish (fin fish or invertebrates) are observed, but the chosen method for salvage proves ineffective for their capture or release, halt construction and develop and implement appropriate alternative mitigation methods (e.g., different salvage methods; adaptations to construction methods).</li> <li>• Require onsite personnel to stop work if wildlife enter the site. Do not commence work until wildlife have vacated the vicinity of the site. Allow wildlife to exit the site on their own, via safe routes. Prohibit onsite personnel from capturing, handling, or harassing wildlife.</li> </ul>

### **6.3 Environmental Monitoring**

Environmental monitoring will be undertaken to provide advice and guidance to CP and the Contractor related to protection of fish and fish habitat, to assess the efficacy of mitigation measures, and to observe and report on compliance with all relevant environmental obligations, including permits/approvals, and any Contractor-prepared environmental protection plans. The designated Site Foreperson will coordinate and direct environmental monitoring activities and ensure that a suitably experienced EM is available to attend the site as needed. An EM must inspect each construction site (or location) on a weekly basis, and an EM must be present at least daily during all high-risk construction activities, including:

- Riprap removal and placement
- Subtidal and intertidal fill placement
- Work occurring within the riparian area (e.g., within 30 m of the top of bank of any waterbody), including riparian clearing
- Work occurring during or following a rainfall.

CP will invite Indigenous communities to accompany the EM. Due to COVID-19, many environmental monitoring opportunities for Indigenous participants have been performed remotely. If required, remote monitoring opportunities will also be considered and in-person monitoring activities will adhere to COVID-19 distancing guidelines.

During low-risk activities, the EM will visit the site at a minimum of once per week. Any active sites must be inspected by the EM within 24 hours of a significant rainfall event (i.e., 25 millimetres or more within any given 24-hour period).

In the event of non-compliance, the EM will determine whether stopping work is necessary in consultation with the Site Foreperson, Contractor, CP, and relevant authorities. The Contractor must implement all appropriate mitigation measures to address the non-compliance or until conditions change such that construction activities can once again be initiated in compliance with all environmental obligations. CP would be consulted by the Contractor prior to any site shutdown.

In the event of any circumstances that result in non-compliance, the EM will determine whether stopping work is necessary in consultation with the Project Environmental Manager, Contractor, and CP. The Contractor must implement all appropriate mitigation measures to address the non-compliance or until conditions change such that construction activities can once again be initiated in compliance with all environmental obligations. CP would be consulted by the Contractor prior to any shutdown.

### **6.4 Environmental Reporting Requirements**

#### **6.4.1 Tailgate Meetings**

Field crew tailgate meetings will be convened by the Contractor and attended by the EM or the designated EM before the start of construction in a new area. These meetings can be integrated with regular health and safety meetings and will be used to review environmental requirements and environmental precautions applicable to the work. The Contractor's crew will sign and date a Tailgate Meeting Record form confirming they have received proper training informing them of their environmental obligations while conducting their work duties. Tailgate meetings, including content pertaining to environmental management and protection, will be documented and kept on file for inspection or auditing.



## 6.4.2 Reporting

The EM will complete and submit environmental monitoring reports in accordance with relevant permit conditions. Typically, the EM will complete daily reports for each day onsite for CP and the Contractor for review and comment. After each week onsite the EM will also prepare a summary report for review and comment by both CP and the Contractor. Any incident reports and follow-up action reports will also be completed digitally in the field as necessary and uploaded once completed. The content of EM reports will include the following, at a minimum:

- Monitoring dates and times
- Weather over the reporting period
- Construction activities undertaken on each alignment
- Any issues identified
- Environmental protection and mitigation measures recommended and implemented and an update regarding maintenance of these items
- Outstanding items, including non-compliances with recommendations from the EM, regulatory agencies, or regulatory documents
- Monitoring plan for the following week.

## 7.0 RESIDUAL EFFECTS

In accordance with federal guidance (Government of Canada 2019d), this assessment of residual effects includes details regarding potential pre-mitigation effects associated with each activity, proposed mitigation measures, and a quantitative description of residual effects to fish following implementation of mitigation measures.

Any identified residual effects for this Project were assessed according to specific criteria (**Table 7.1**), to evaluate the potential for notable residual effects to fish and fish habitat. Notable residual effects are defined here as any mortality to fish and/or alteration of habitat sufficient to result in a localized impact on the population in the Project area). The potential for notable residual effects is based on the QEP's judgment, and is characterized as follows:

- **Low:** unlikely to result in residual effects
- **Medium:** moderately likely to result in residual effects
- **High:** highly likely to result in residual effects.

**Table 7.1 Criteria Used to Evaluate Residual Effects on Fisheries Resources**

Characteristic and Description		Rank and Description of Associated Residual Effect	
<b>Likelihood</b>	Likelihood and risk of the residual effect occurring	Likely	Residual effect likely to occur
		Unlikely	Residual effect unlikely to occur
<b>Duration</b>	Length of time over which the residual effect is expected to persist. For example, is the duration short enough that it does not diminish the ability of fish to carry out one or more of its life processes?	Short Term	Days to weeks
		Moderate Term	Months to 1 year
		Long Term	Multiple years to permanent
<b>Magnitude</b>	Intensity of the effect relative to natural or baseline conditions	Negligible	No measurable change in fish populations, fish habitat quality or quantity, parameters
		Low	A measurable change within the range of natural variability, but not affecting fish population viability
		Moderate	A measurable change outside the range of natural variability, but not posing a risk to fish population viability
		High	A measurable change outside the range of natural variability and may affect long-term fish population viability

Characteristic and Description		Rank and Description of Associated Residual Effect	
<b>Geographic Scale</b>	Geographic extent and distribution of the residual effect. For example, is the scale small enough that the disturbance will not displace fish that would otherwise be occupying the habitat?	Site	Site/segment, localized effect, or temporary displacement
		Reach	Waterbody significantly affected or permanent displacement (central portions of Burrard Inlet, within vicinity of Second Narrows; i.e., 2 km from Site)
		Waterbody	Majority of waterbody affected or permanent displacement (entire Burrard Inlet)
<b>Reversibility</b>	Potential for the effect to be reversed or naturally return to baseline level after the disturbance has ceased (or after a period of time after the disturbance has ceased)	Reversible	Baseline conditions will be naturally restored after disturbance has ceased
		Irreversible	Baseline conditions will not be naturally restored after disturbance has ceased
<b>Ecological Context</b>	The availability and condition of the habitat to be altered, relative to nearby fish habitat. For example, is the habitat that is being altered or destroyed the only habitat of its type and quality in the area of the Project?	Prevalent	Altered habitat is prevalent and widely distributed in the study area or waterbody is still suitable
		Limited	Altered habitat is confined to small areas or has limited distribution in the study area or waterbody and is significantly reduced in quality
		Rare	Altered habitat is rare or limiting (critical habitat, species at risk) and is no longer suitable

A summary of harmful alteration and destruction by habitat type is provided below as **Table 7.2**. In addition, a summary of the assessment of potential for notable residual effects for each of the potential effects is provided below in **Table 7.3**. This assessment is conditional upon the implementation of the recommended site-specific and restorative mitigation measures described in **Section 6.0**.



**Table 7.2 Residual Effects Assessment for Project-related Effects on Fisheries Resources**

Pathway of Effect (see Table 4)	Associated Project Activities (see Table 4)	Applicable Mitigation Measures (see Table 5 for more details)	Evaluation of Residual Effect					Potential for Adverse Residual Effects to Fisheries Productivity	Explanation of Potential for Adverse Residual Effects	
			Likelihood	Duration	Magnitude	Geographic Scale	Reversibility			Ecological Context
<b>Change in sediment concentrations</b>	<ul style="list-style-type: none"> <li>Use of industrial equipment</li> <li>Placement of materials and structures in water</li> <li>Grading</li> <li>Vegetation removal</li> </ul>	<ul style="list-style-type: none"> <li>Construct the Project during the fisheries window of least risk for the Lower Mainland region (<b>August 16 to February 28</b>).</li> <li>Implement DC Plan, WQM Plan, Erosion and Sediment Control Plan; ensure riprap is clean; conduct water quality monitoring.</li> </ul>	Likely	Short Term	Low	Site	Reversible	Prevalent	<b>Low</b>	With application of appropriate mitigation (e.g., erosion and sediment control measures), there is low likelihood of any notable changes in sediment concentrations. In the unlikely event that changes in sediment concentrations are noted, it is anticipated that only a localized and short-term effect would result. The potential for adverse residual effects to fisheries productivity resulting from a change in sediment concentrations is low.
<b>Change in contaminant concentrations</b>	<ul style="list-style-type: none"> <li>Use of industrial equipment</li> <li>Dredging</li> <li>Placement of materials and structures in water</li> <li>Grading</li> <li>Riparian removal</li> </ul>	<ul style="list-style-type: none"> <li>Implement SPR Plan.</li> <li>Ensure all machinery is clean and well maintained; fuel, wash and maintain equipment in an appropriate location that is set back from the river; use biodegradable fluids in machinery; have spill kits on hand.</li> </ul>	Unlikely	Short Term	Negligible	Site	Reversible	Prevalent	<b>Low</b>	Although the use of industrial equipment inherently increases the risk of changes in contaminant concentrations in aquatic habitats, BMPs for working near water, use of biodegradable machinery fluids and application of appropriate SPR are expected to reduce the risk of residual effects. The overall potential for adverse residual effects to fisheries productivity is low.
<b>Change in habitat structure and cover</b>	<ul style="list-style-type: none"> <li>Dredging</li> <li>Placement of materials and structures in water</li> <li>Grading</li> <li>Riparian removal</li> </ul>	<ul style="list-style-type: none"> <li>Restore 6ll upland areas to the original gradient and restore vegetation.</li> <li>Re-contour all disturbed areas to blend in with the existing landscape.</li> <li>Position barges and water-borne construction equipment with enough clearance to prevent damage to fish habitat.</li> </ul>	Likely	Long Term	Low	Site	Irreversible	Prevalent	<b>Moderate</b>	<p>The Project will result in the destruction or permanent alteration of approximately 5,028 m<sup>2</sup> of marine riparian vegetation, 4,029 m<sup>2</sup> of Fucus community, 2,704 m<sup>2</sup> of benthic algal community, 2 m<sup>2</sup> of kelp bed habitat, and 6,783 m<sup>2</sup> of unvegetated substrates.</p> <p>The Project will result in the permanent alteration of 357 m<sup>2</sup> of marine riparian vegetation, 814 m<sup>2</sup> of Fucus community, 5,798 m<sup>2</sup> of benthic algal community, 963 m<sup>2</sup> of kelp bed, and 3,382 m<sup>2</sup> of unvegetated substrates. These substrates will be altered to modified intertidal habitat comprised of a 2:1 riprap slope on the outer (seaward) side of the new infill.</p> <p>To summarize, the Project is expected to result in the destruction of approximately 11,314 m<sup>2</sup> (357 m<sup>2</sup> of lower-value riparian vegetation, 4,195 m<sup>2</sup> of intertidal habitat, and 6,761 m<sup>2</sup> of subtidal habitat). Furthermore, it is anticipated that the Project will result in the permanent alteration of approximately 18,546 m<sup>2</sup> (5,028 m<sup>2</sup> of riparian vegetation, 10,811 m<sup>2</sup> of intertidal habitat, and 2,706 m<sup>2</sup> of subtidal habitat).</p> <p>Considering site conditions (e.g., well flushed by tidal currents) and anticipated rates of marine biota colonization (e.g., sessile biota, including barnacles, rockweed, and other macroalgae), all permanently altered habitats will become productive intertidal habitat within a few years. For instance, the new riprap slope will quickly replace previous intertidal habitat. Similar recovery rates will apply to intertidal and subtidal areas affected by dredging and the short-term footprint of the temporary work pad.</p> <p>The Project will commit to offsetting activities of equal or greater value than residual HADD expected to occur as a result of the Project. Offsetting activities will consider affected habitat types and lag time between offsetting construction and establishment of functioning ecosystem. The Offsetting Plan will include provisions for follow-up monitoring to evaluate success pursuant to a <i>Fisheries Act</i> Authorization.</p> <p>Although some residual adverse effects will occur over the long term, the natural re-establishment of marine communities and restorative mitigation are expected to ensure avoidance of any notable, long-term effects on fish habitat productivity.</p>

Pathway of Effect (see Table 4)	Associated Project Activities (see Table 4)	Applicable Mitigation Measures (see Table 5 for more details)	Evaluation of Residual Effect					Potential for Adverse Residual Effects to Fisheries Productivity	Explanation of Potential for Adverse Residual Effects	
			Likelihood	Duration	Magnitude	Geographic Scale	Reversibility			Ecological Context
<b>Mortality of fish</b>	<ul style="list-style-type: none"> <li>Use of industrial equipment</li> <li>Dredging</li> <li>Placement of materials and structures in water</li> <li>Grading</li> </ul>	<ul style="list-style-type: none"> <li>Site barges and water-borne equipment away from sensitive fish habitat.</li> <li>Have vessels adhere to all relevant marine mammal regulations and setback distances.</li> <li>Conduct a salvage or marine organisms prior to construction.</li> </ul>	Unlikely	Short Term	Low	Site	Reversible	Prevalent	<b>Low</b>	Pre-construction salvages of marine organisms from the Project footprint are expected to mitigate the potential death of sessile and mobile marine invertebrates and finfish. Additionally, by ensuring that the works are undertaken during low tide, where possible, during the fisheries least risk window, and with the application of other BMPs, it is anticipated that any residual effects relating to potential fish mortality are unlikely. The overall potential for adverse residual effects to fisheries productivity is low.



The Project is expected to result in the harmful alteration of 18,546 m<sup>2</sup> of fish habitat and the permanent destruction of 11,314 m<sup>2</sup> of fish habitat, summarized in the table below. The Project will therefore result in residual effects to fish and fish habitat and will require measures to offset these effects.

**Table 7.3 Summary of Harmful Alteration and Destruction of Habitat**

Habitat	Total Project Footprint (m <sup>2</sup> )	Total Harmful Alteration (m <sup>2</sup> )	Total Permanent Destruction (m <sup>2</sup> )
Marine Riparian	16,466	5,028	357
Fucus Community	6,374	4,029	814
Benthic Algal Community	24,189	2,704	5,798
Kelp Bed	17,126	2	963
Unvegetated	18,100	6,783	3,382
<b>Total</b>	<b>82,255</b>	<b>18,546</b>	<b>11,314</b>

## 8.0 CLOSURE

We sincerely appreciate the opportunity to have assisted you with this Project and if you have any questions, please do not hesitate to contact the undersigned by phone at 604.669.0424.

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**Hemmera Envirochem Inc.**



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Marine Biologist

Report prepared by:  
**Hemmera Envirochem Inc.**



Simon Phillips, B.Sc., M.Sc., R.P.Bio.  
Biologist

Report reviewed by:  
**Hemmera Envirochem Inc.**



Tim Edgell, B.Sc., PhD, R.P.Bio.  
Director, Marine Science and Infrastructure  
Development



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# **APPENDIX A**

## **Design Drawing Set**





**ISSUED FOR INFORMATION**  
DATE:

**LOCATION PLAN**  
SCALE 1:2500

- NOTES:**
- VFPA (GVRD STORM OUTFALL) PLAN 2004-017 BBY088-00747-004
  - NOT ALL CHARGES, SRW'S AND EASEMENTS AFFECTING SUBJECT PROPERTIES ARE SHOWN
  - ELEVATIONS ARE IN m TO CGVD28
- REFERENCE MATERIALS:**
- PROPERTY LINES BASED ON UNDERHILL PLAN H-3426-R5 (V17183-TOP-01-U-R5.dwg) DATED JUNE 23, 2020
  - VFPA LEASE PLAN 2017-012

Sep 04, 2020, 5:04pm Login name: KIM79037  
 Drawing Name: C:\pwworking\kim79037\p0693339\362379-PR-100-S0-005.dwg

ENCROACHMENT AREAS INSIDE CP ROW	
PROPOSED TRACK	
PROPERTY LINE	
HIGH WATER	
LOW WATER	
TOE OF SLOPE	
BUFFER	

**HATCH**

METRIC  
DIMENSIONS ARE IN METRES AND/OR MILLIMETRES  
UNLESS OTHERWISE NOTED

DESIGNED BY: T.I. DATE: 20-07-20	DRAWN BY: T.I. DATE: 20-07-20
CHECKED BY: J.C. DATE: 20-07-20	PROJECT MANAGER: J.L. DATE: 20-07-20
HATCH PROJECT No: <b>362379</b>	DWG SCALE(FULL SIZE): <b>1:2500</b>

PROFESSIONAL SEALS

No.	DATE	REVISION	BY
B	04-09-20	ISSUED FOR INFORMATION, UPDATED TOE AND BUFFER EXTENT	S.K.
A	21-07-20	ISSUED FOR INFORMATION	T.L.

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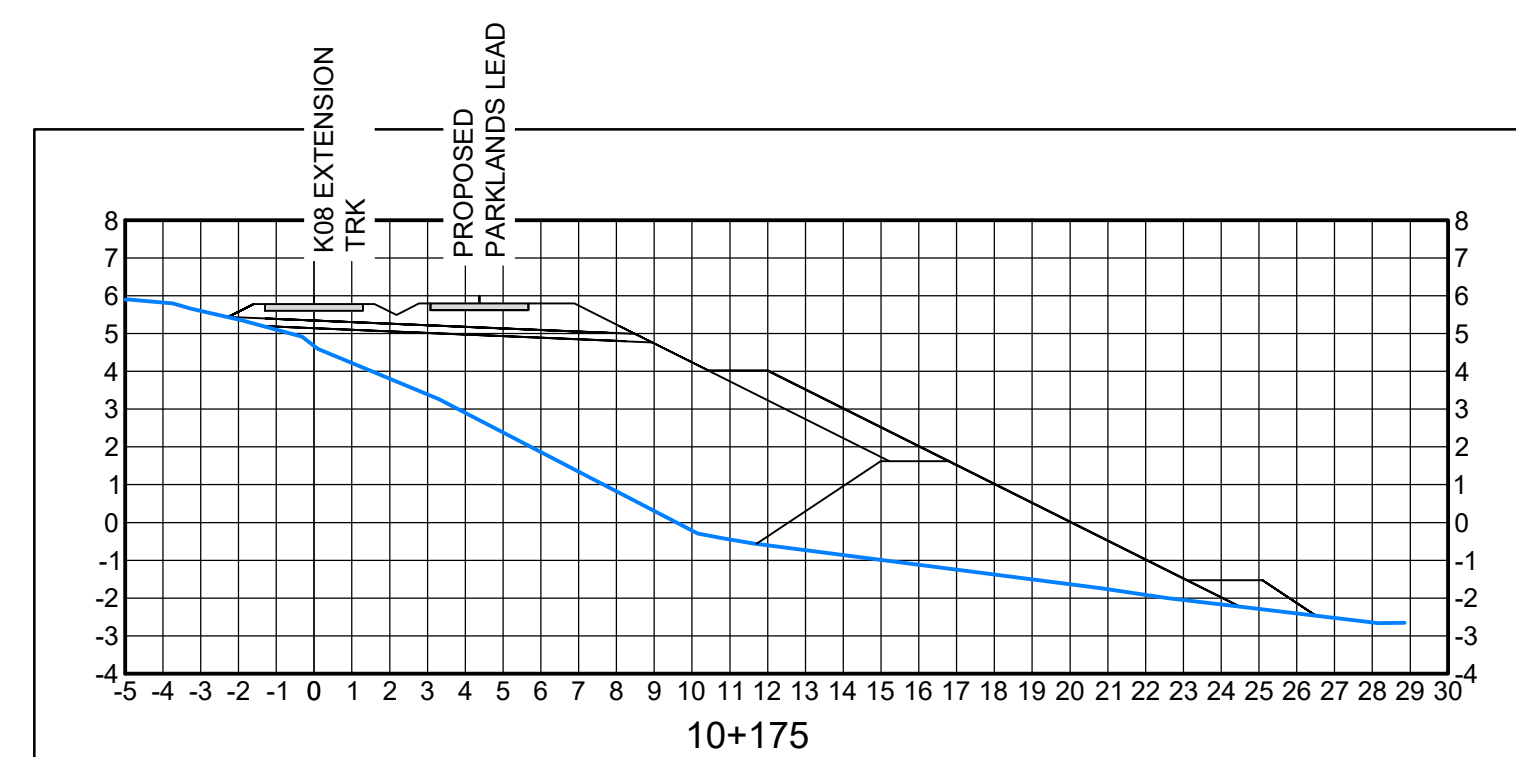
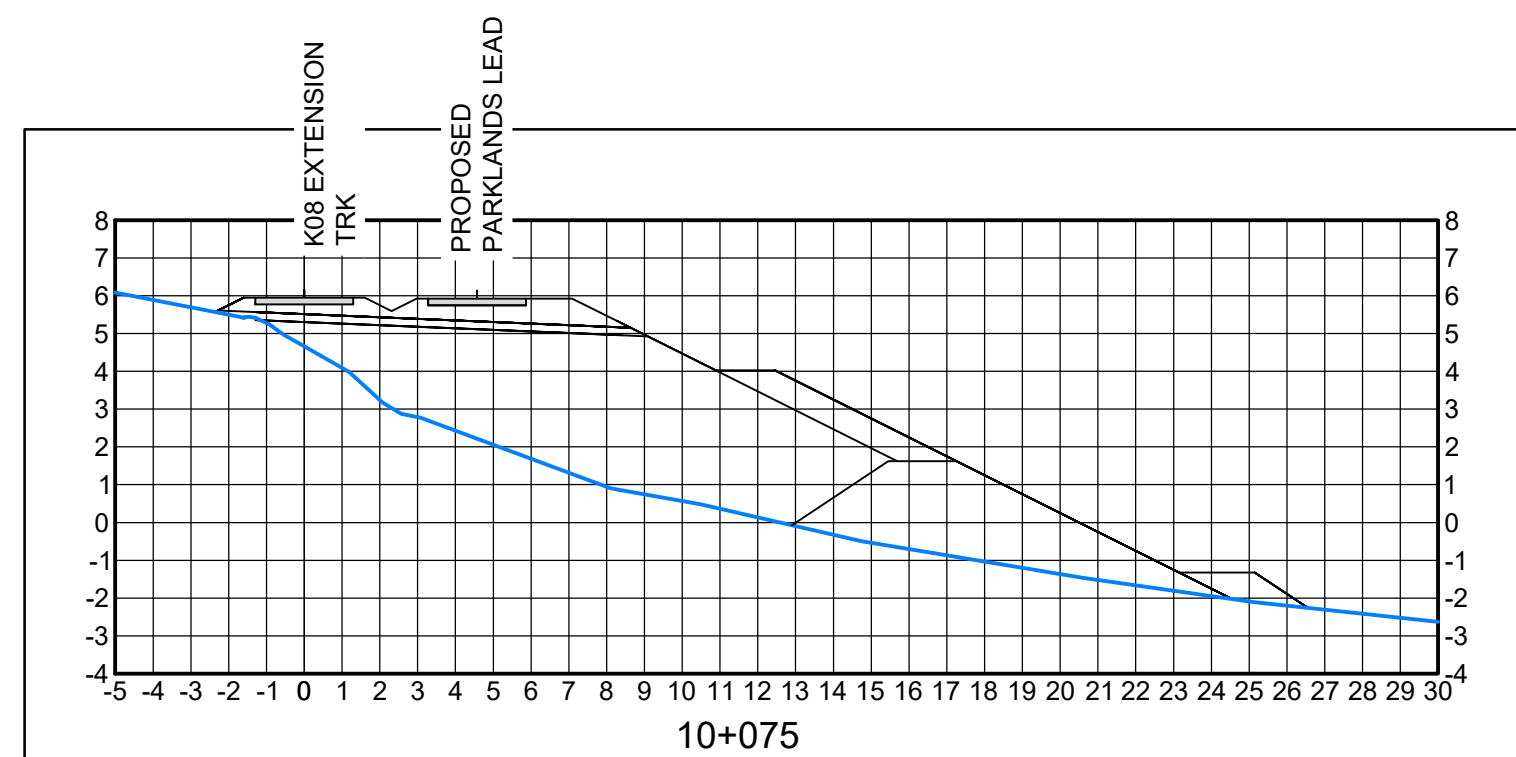
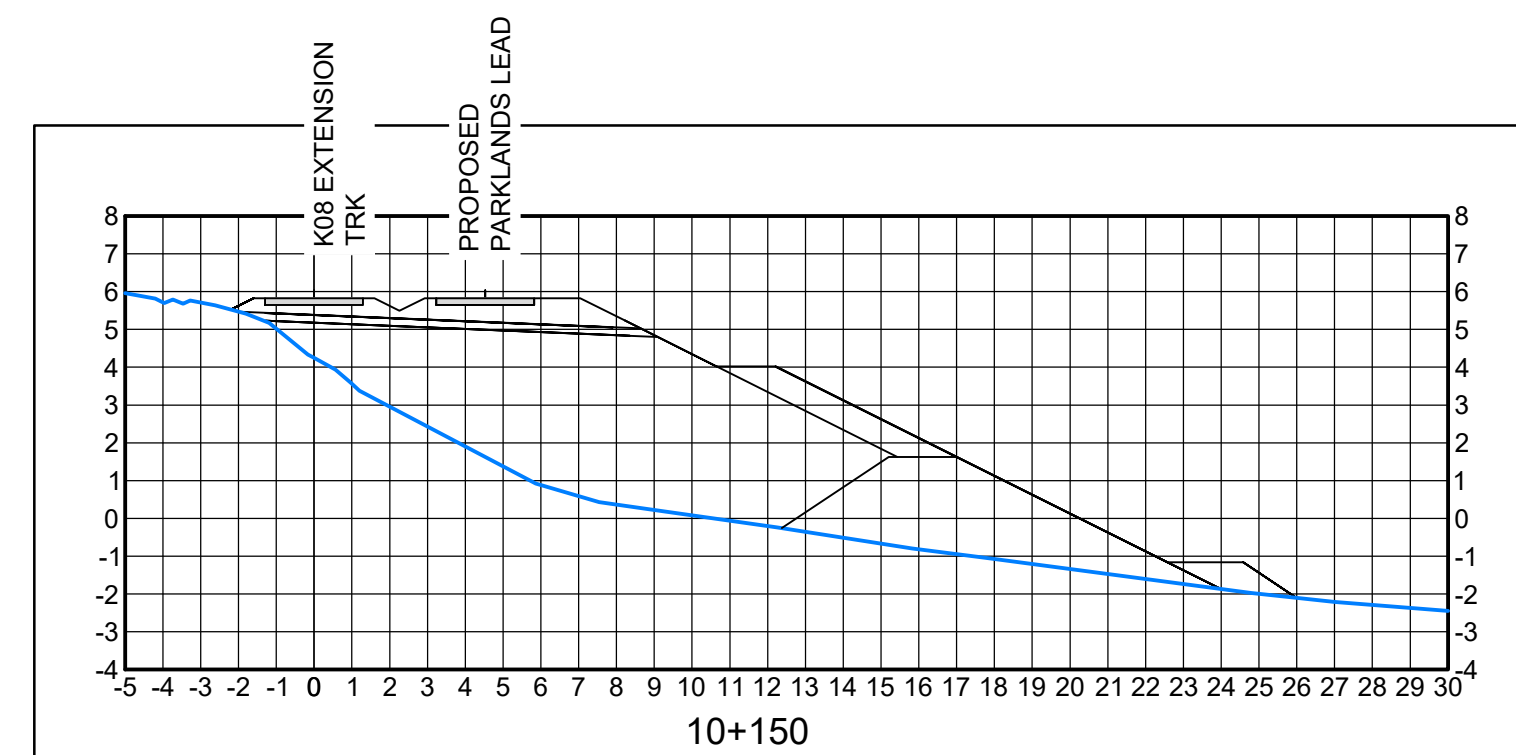
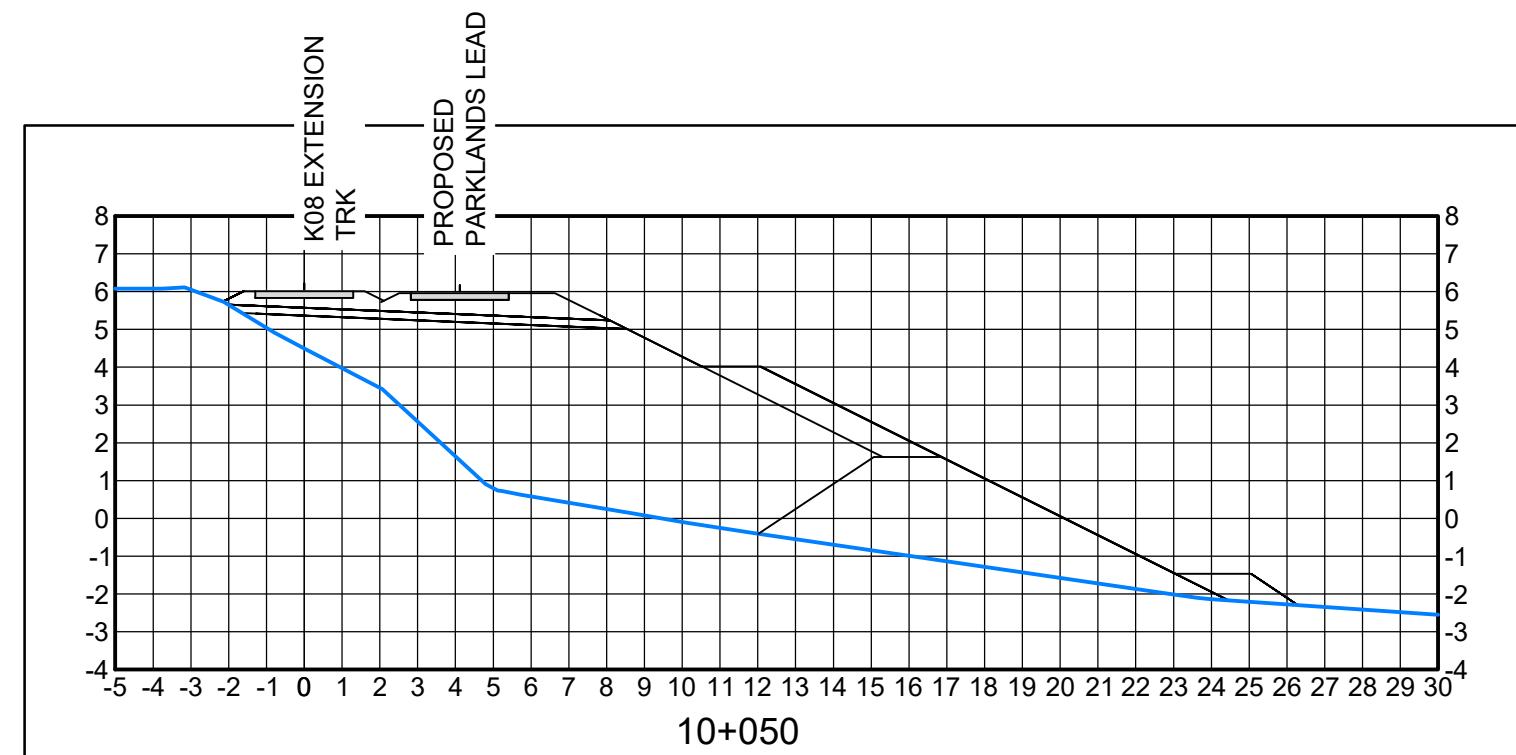
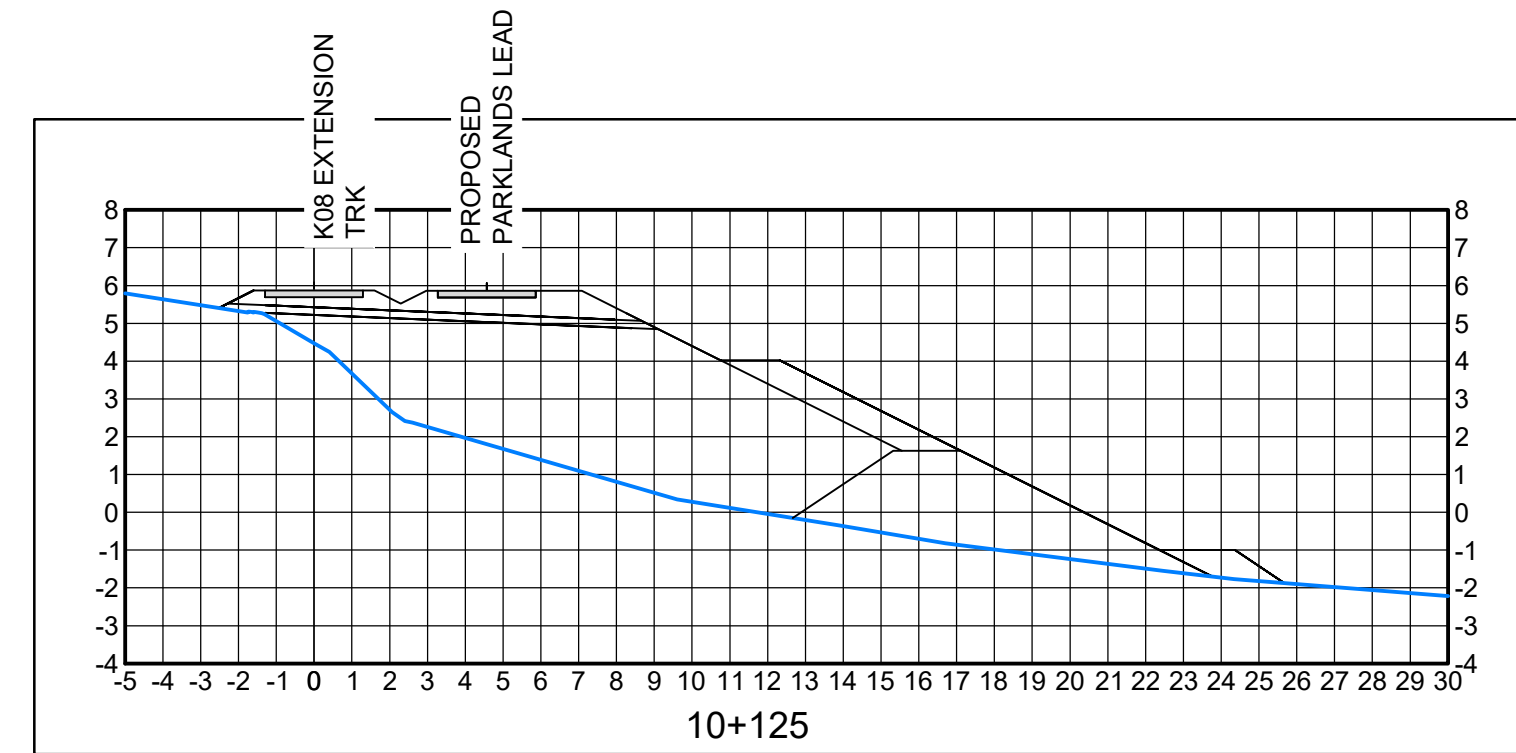
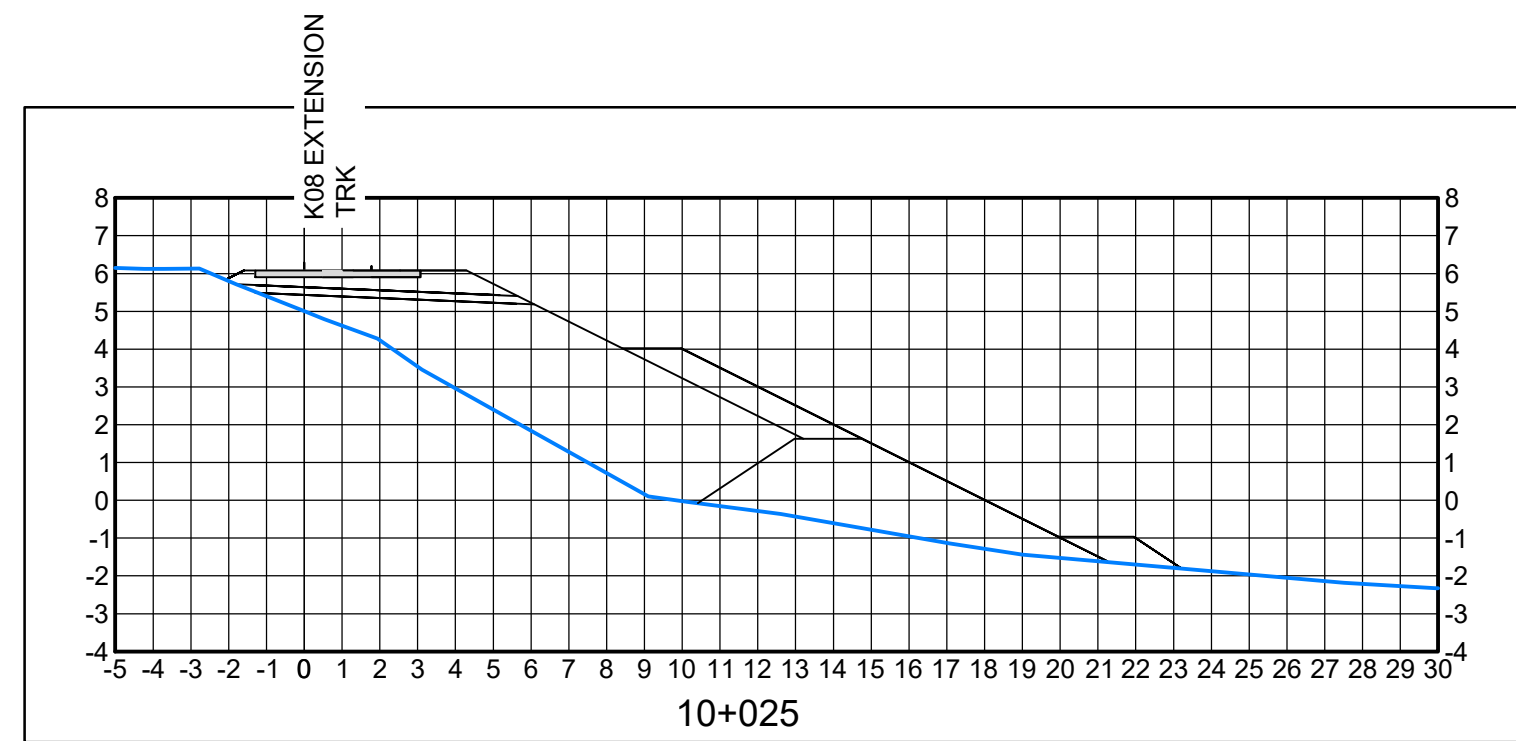
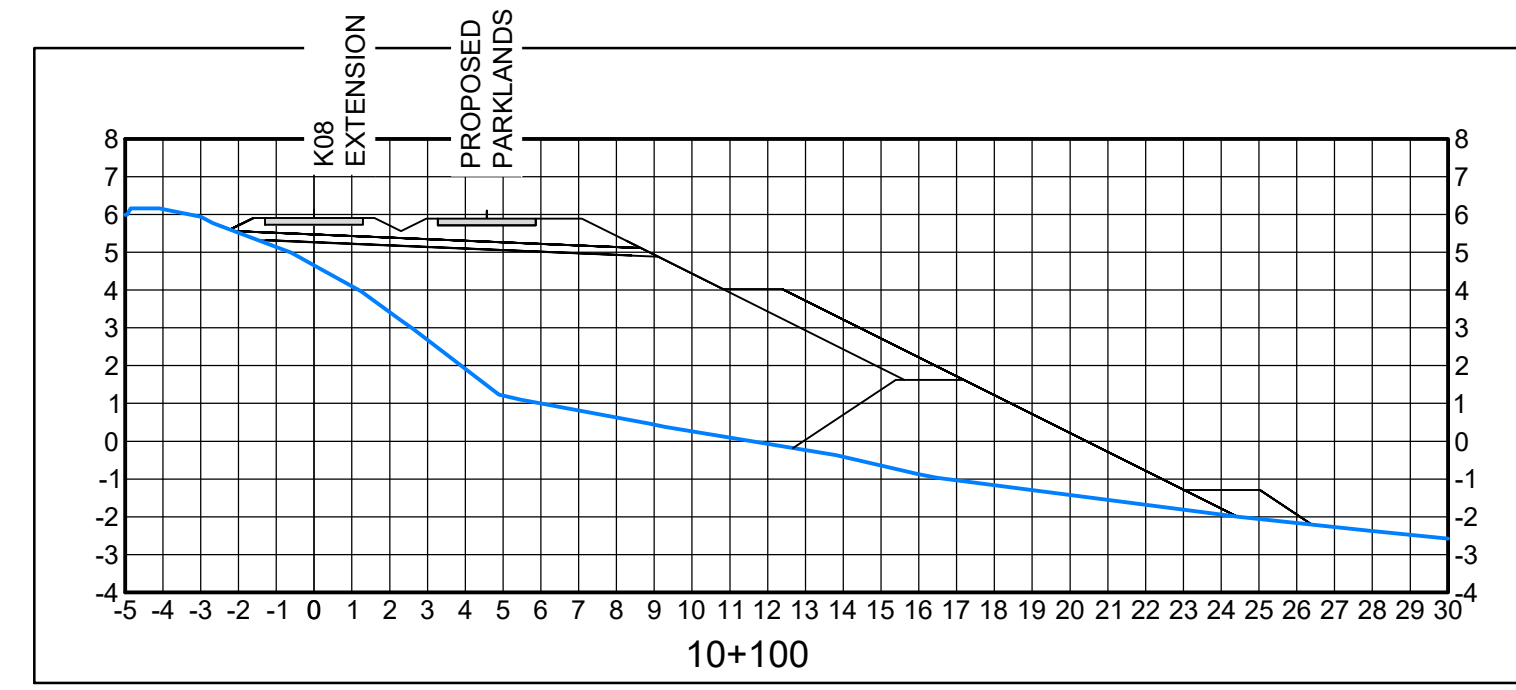
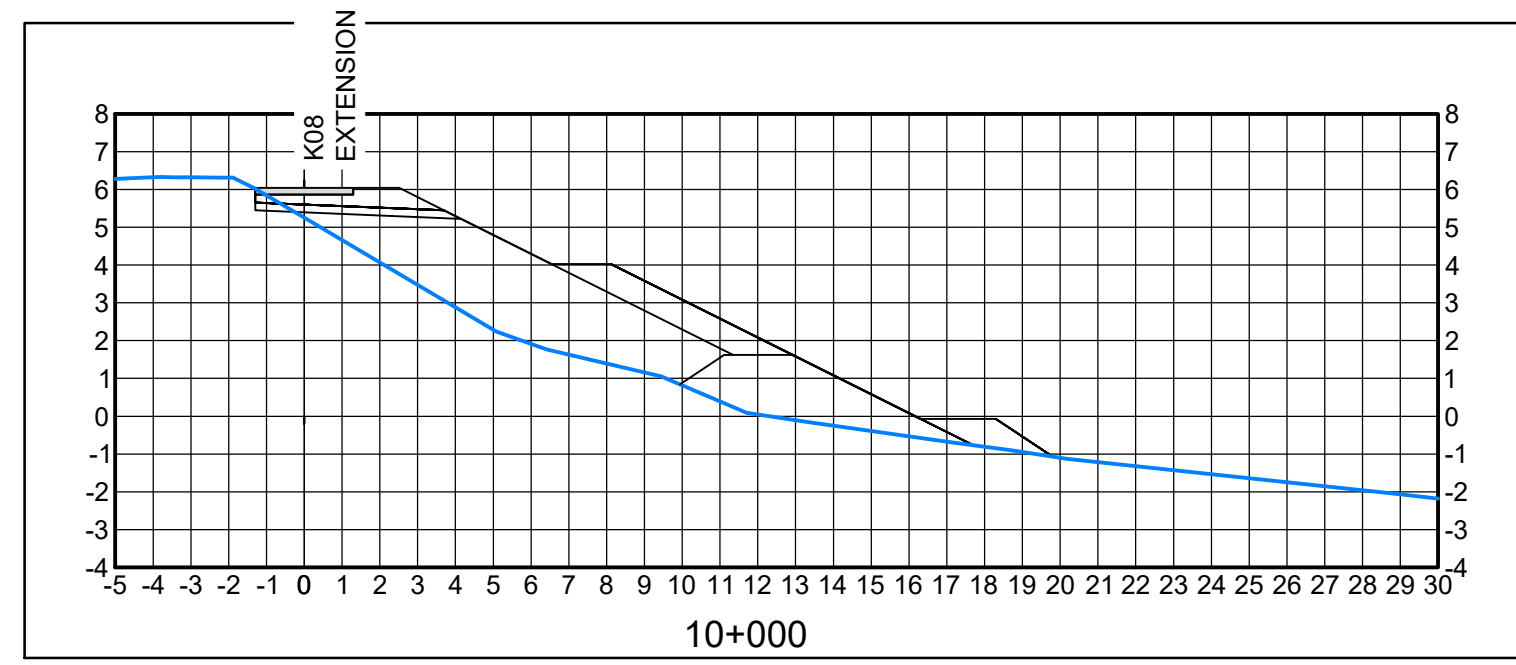
No.	DATE	REVISION	BY
B	04-09-20	ISSUED FOR INFORMATION, UPDATED TOE AND BUFFER EXTENT	S.K.
A	21-07-20	ISSUED FOR INFORMATION	T.L.

**CP**

ENGINEERING PROJECTS - WEST

VANCOUVER DIVISION		MILE 122.93 TO 124.16 CASCADE SUBDIVISION	
<b>CASCADIA EAST EXTENSION - PHASE 4 PROPERTY OVERVIEW AND INFORMATION OVERALL PLAN</b>			
DWG. BY:	CHK BY:	OFFICE FILE:	
MANAGER - DESIGN:		SCALE:	
M.FAVREAU DIR. PROJECTS & PUBLIC WORKS - WEST		DATE: PLAN No.	Rev. B
		362379-PR-100-S0-100	





**DRAFT**  
DATE:

Sep 01, 2020, 1:23pm Login name: IMAM872934 Drawing Name: C:\pwworking\hatch\imam872934\d0693839\Sections for Collier.dwg

**HATCH**

METRIC  
DIMENSIONS ARE IN METRES AND/OR MILLIMETRES  
UNLESS OTHERWISE NOTED

DESIGNED BY:	DRAWN BY:
T.I.	T.I.
DATE: 20-07-20	DATE: 20-07-20
CHECKED BY:	PROJECT MANAGER:
J.C.	T.I.
DATE: 20-07-20	DATE: 20-07-20
HATCH PROJECT No:	DWG SCALE(FULL SIZE):
362379	1:2000

PROFESSIONAL SEALS

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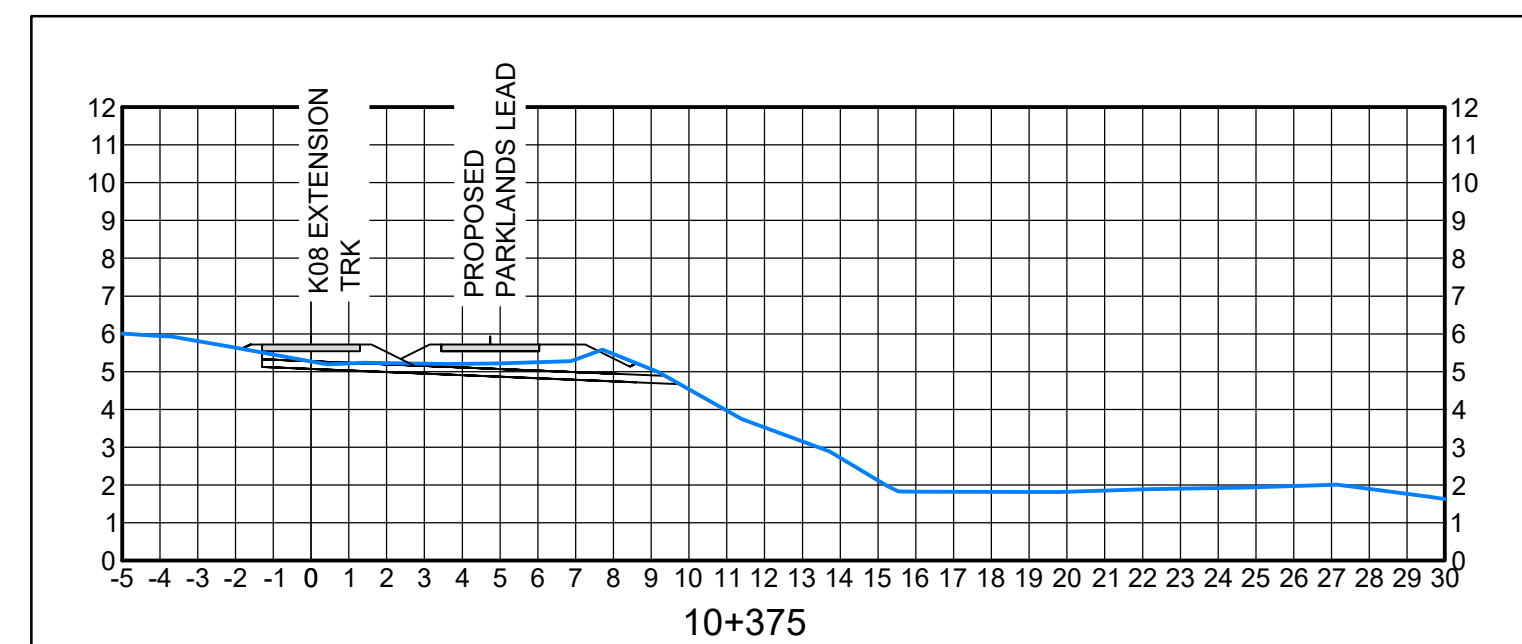
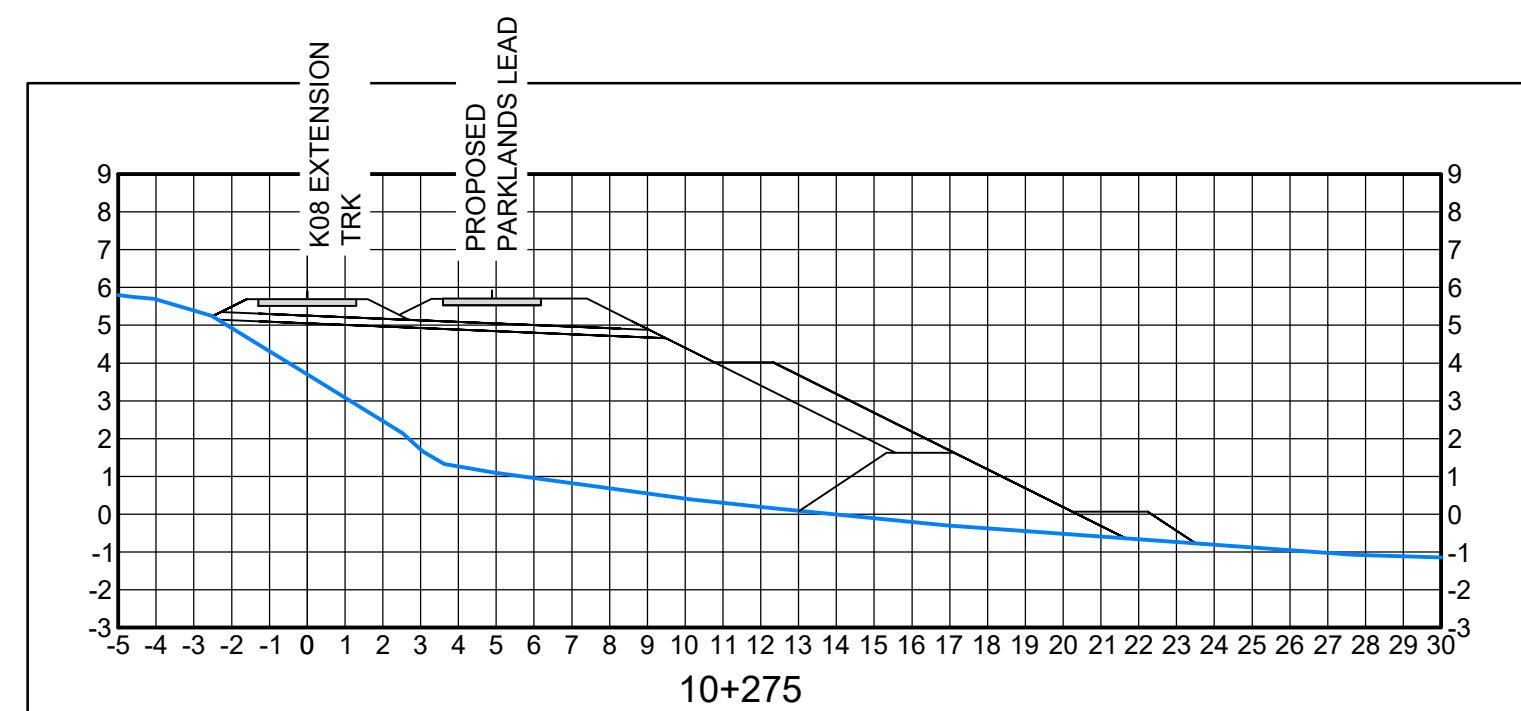
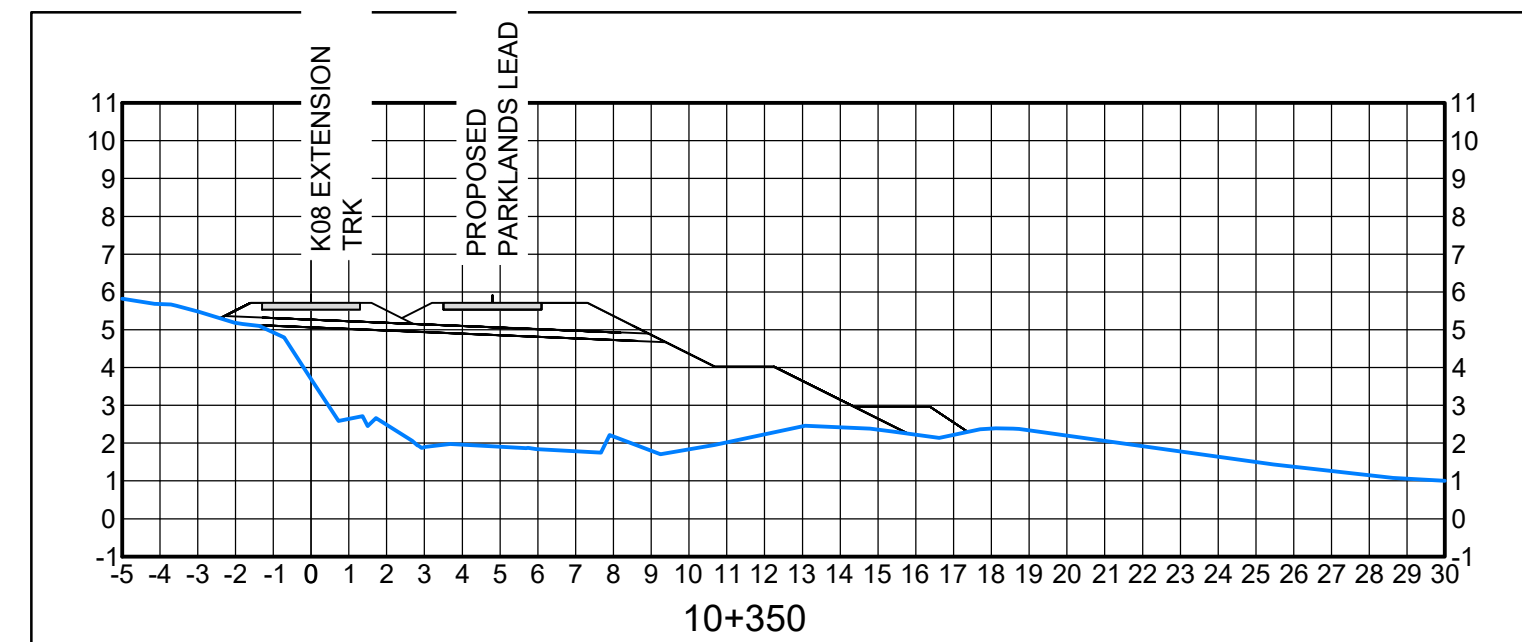
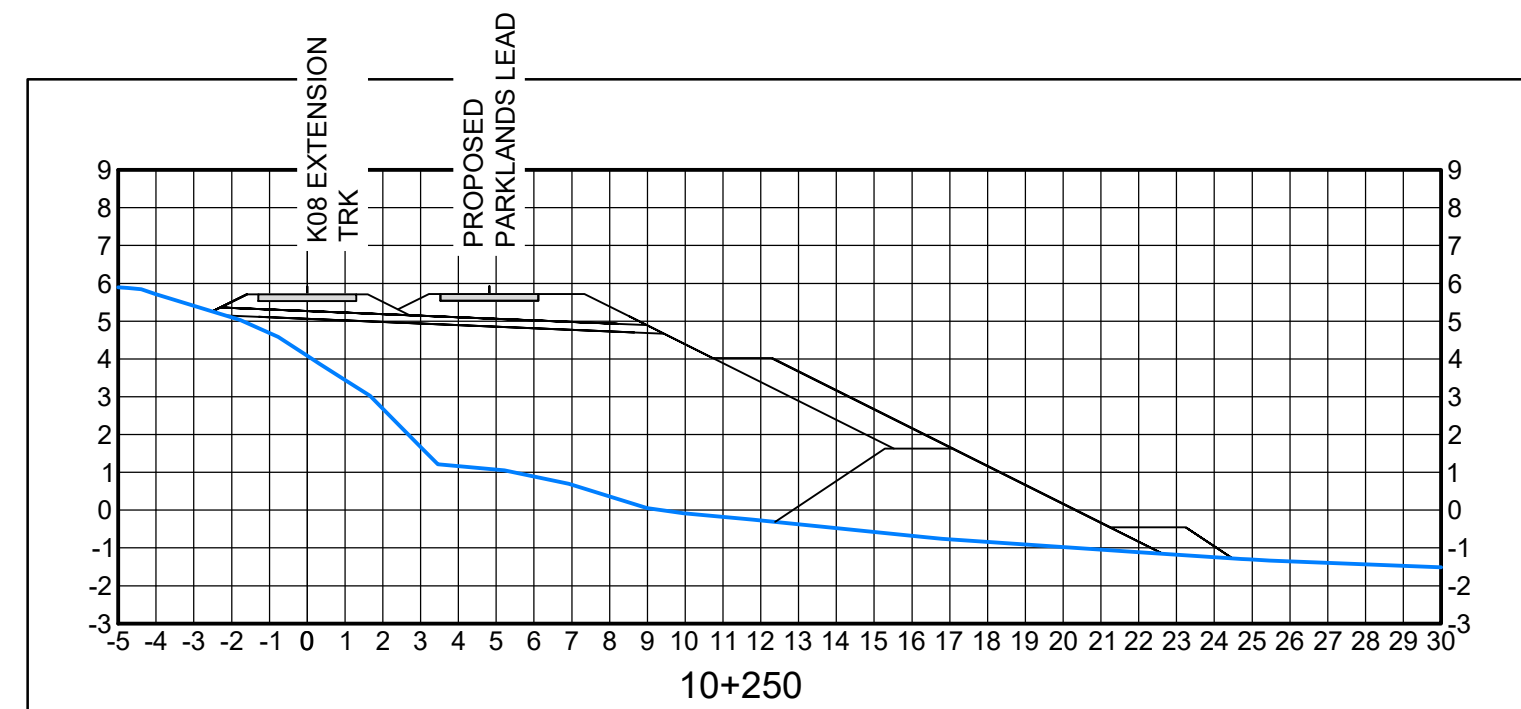
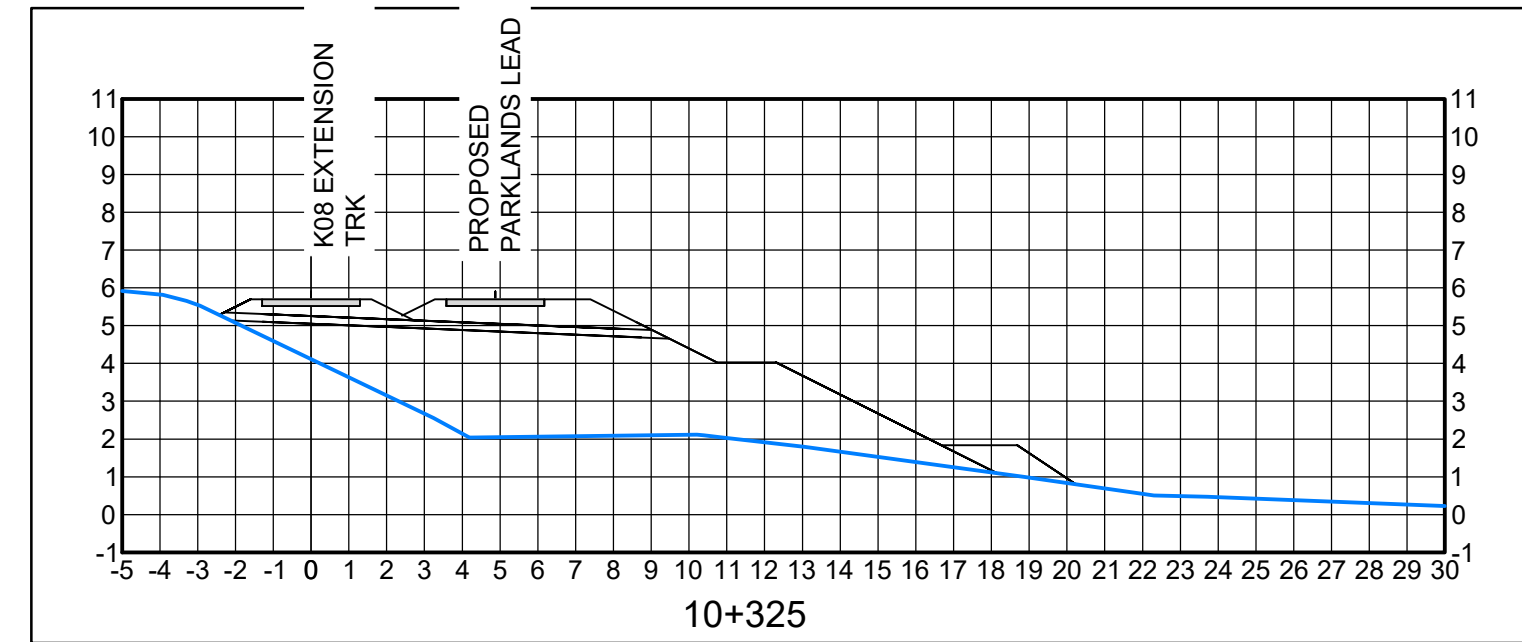
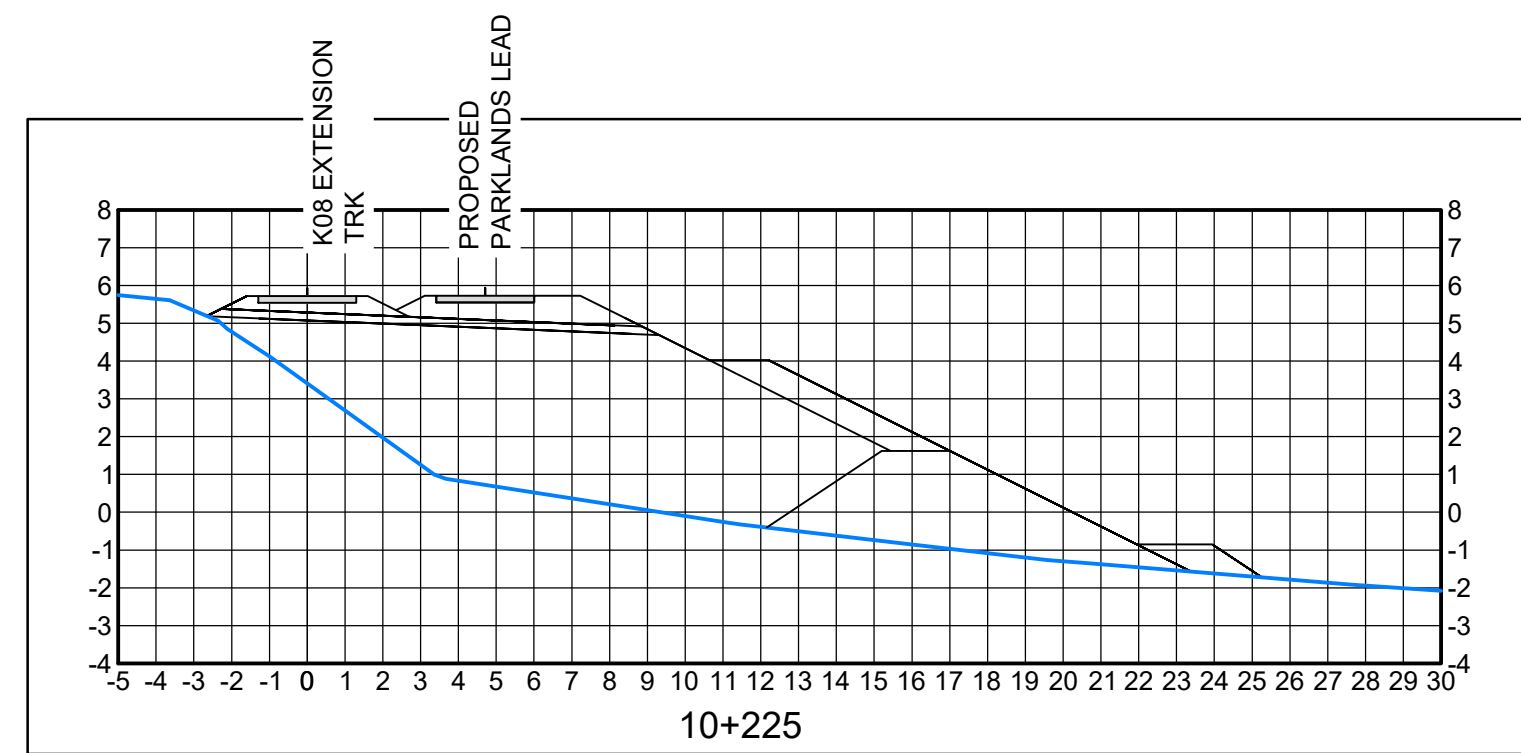
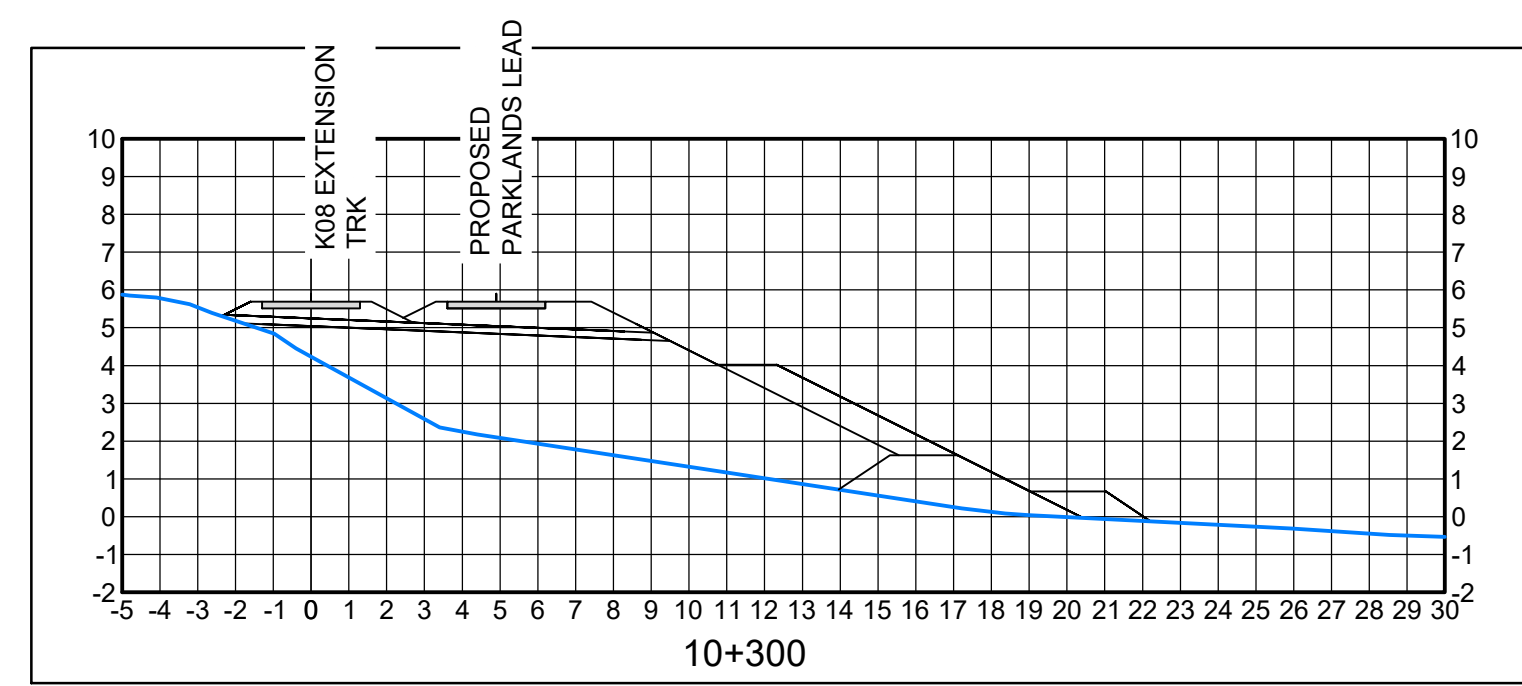
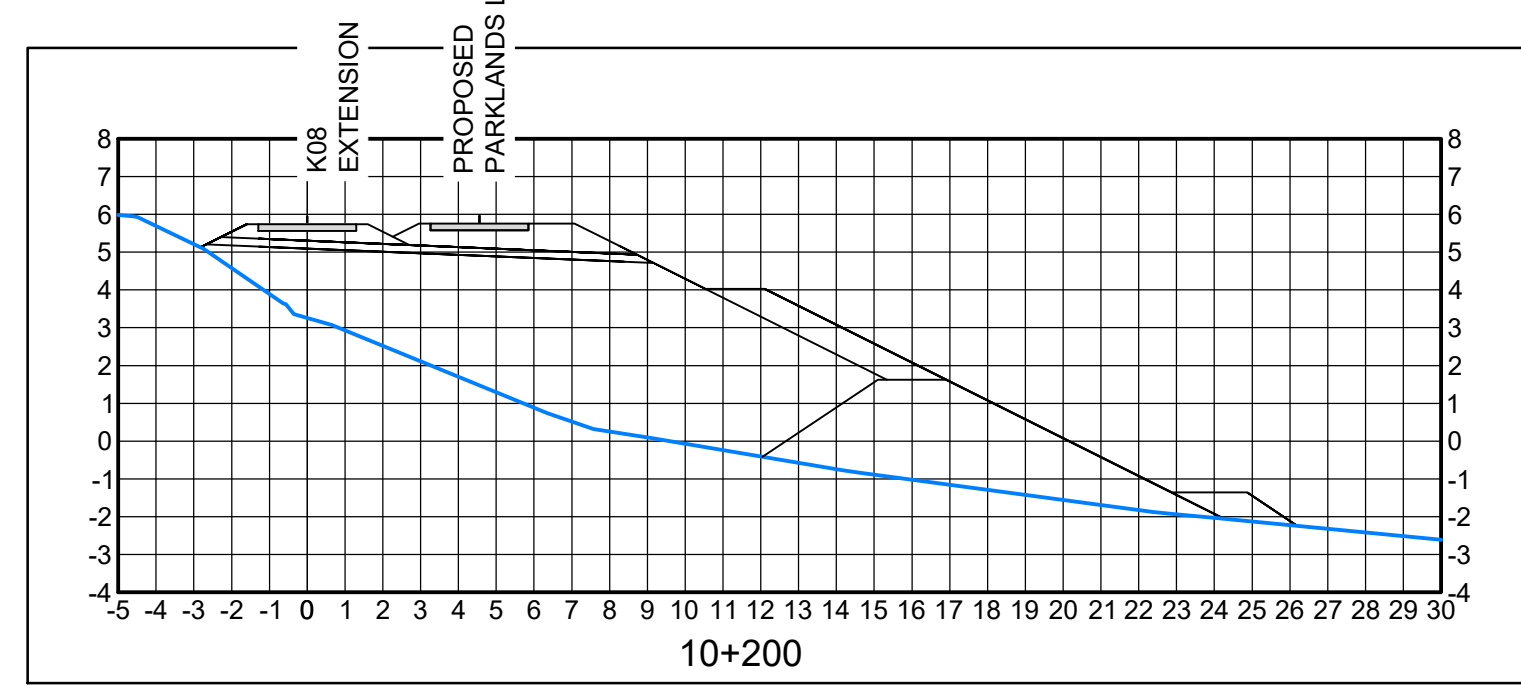
No.	DATE	REVISION	BY
B	20-09-01	ISSUED FOR INFORMATION ONLY - DRAFT	T.I.
A	20-08-14	ISSUED FOR INFORMATION ONLY - DRAFT	T.I.

**CP**

ENGINEERING PROJECTS - WEST

VANCOUVER DIVISION		MILE 122.93 TO 124.16 CASCADE SUBDIVISION	
<b>CASCADIA EAST EXTENSION - PHASE 4 PROPOSED SIDING EXTENSION OPTION 1 SECTIONS</b>			
DWG. BY:	CHK BY:	OFFICE FILE:	
MANAGER - DESIGN:		SCALE:	
M. FAVREAU		DATE:	
DIR, PROJECTS & PUBLIC WORKS - WEST		PLAN No.	
		362379-RW-100-S0-300	
			Rev.
			B





**DRAFT**  
DATE:

Sep 01, 2020, 1:23pm Login name: IMAM872934 Drawing Name: C:\pwworking\hatch\imam872934\0693839\Sections For Golden.dwg

**HATCH**

METRIC  
DIMENSIONS ARE IN METRES AND/OR MILLIMETRES  
UNLESS OTHERWISE NOTED

DESIGNED BY:	DRAWN BY:
T.I.	T.I.
DATE: 20-07-20	DATE: 20-07-20
CHECKED BY:	PROJECT MANAGER:
J.C.	T.I.
DATE: 20-07-20	DATE: 20-07-20
HATCH PROJECT No:	DWG SCALE(FULL SIZE):
362379	1:2000

PROFESSIONAL SEALS

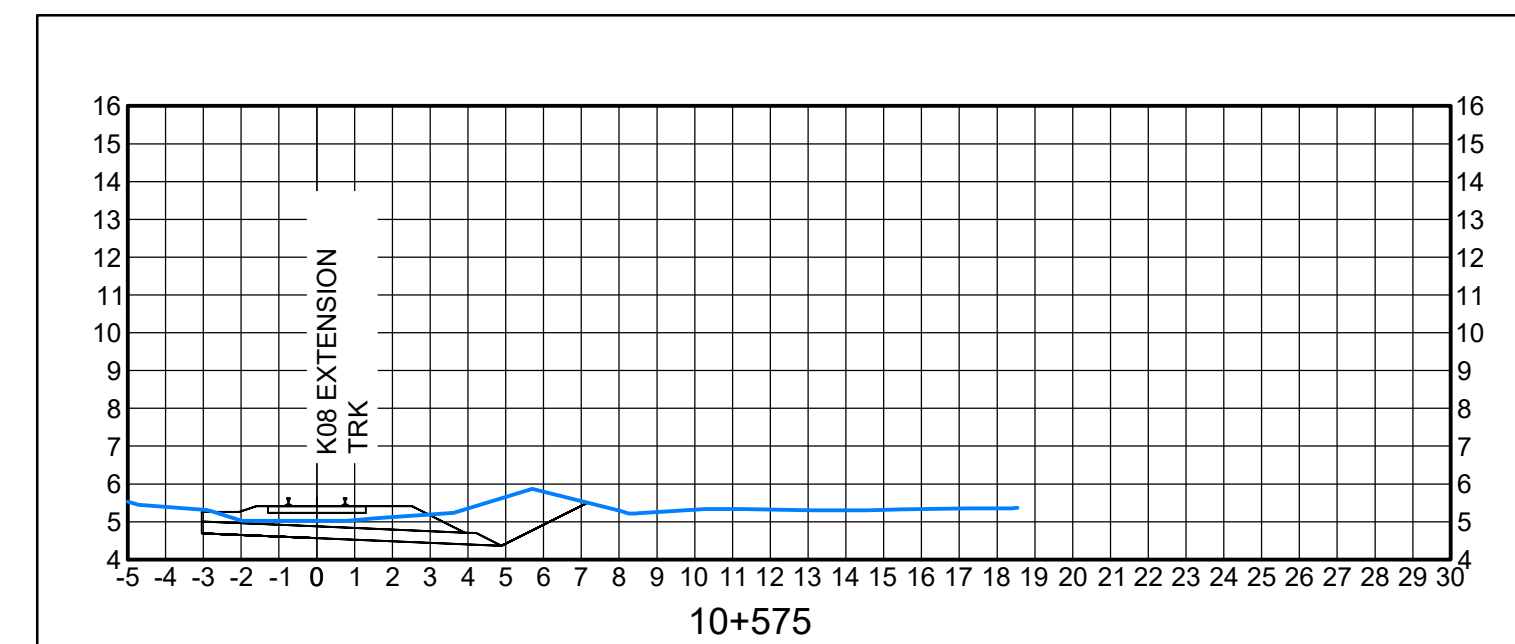
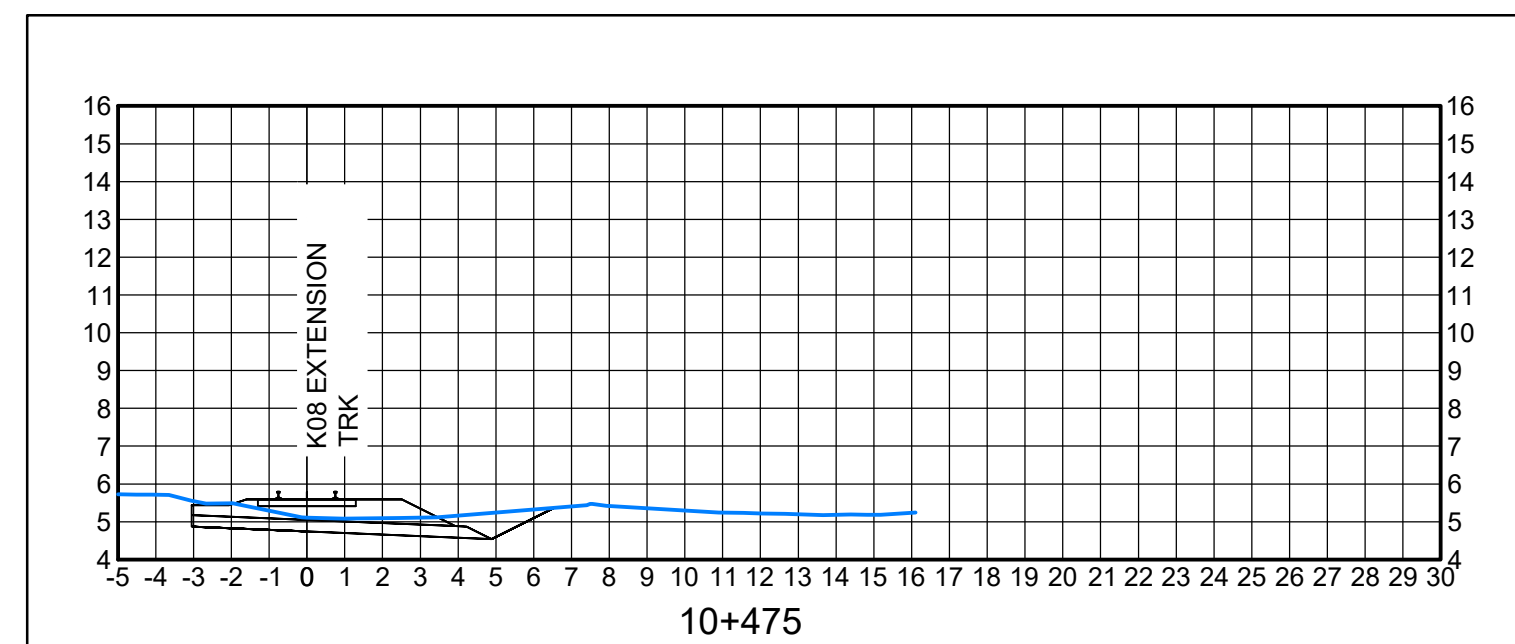
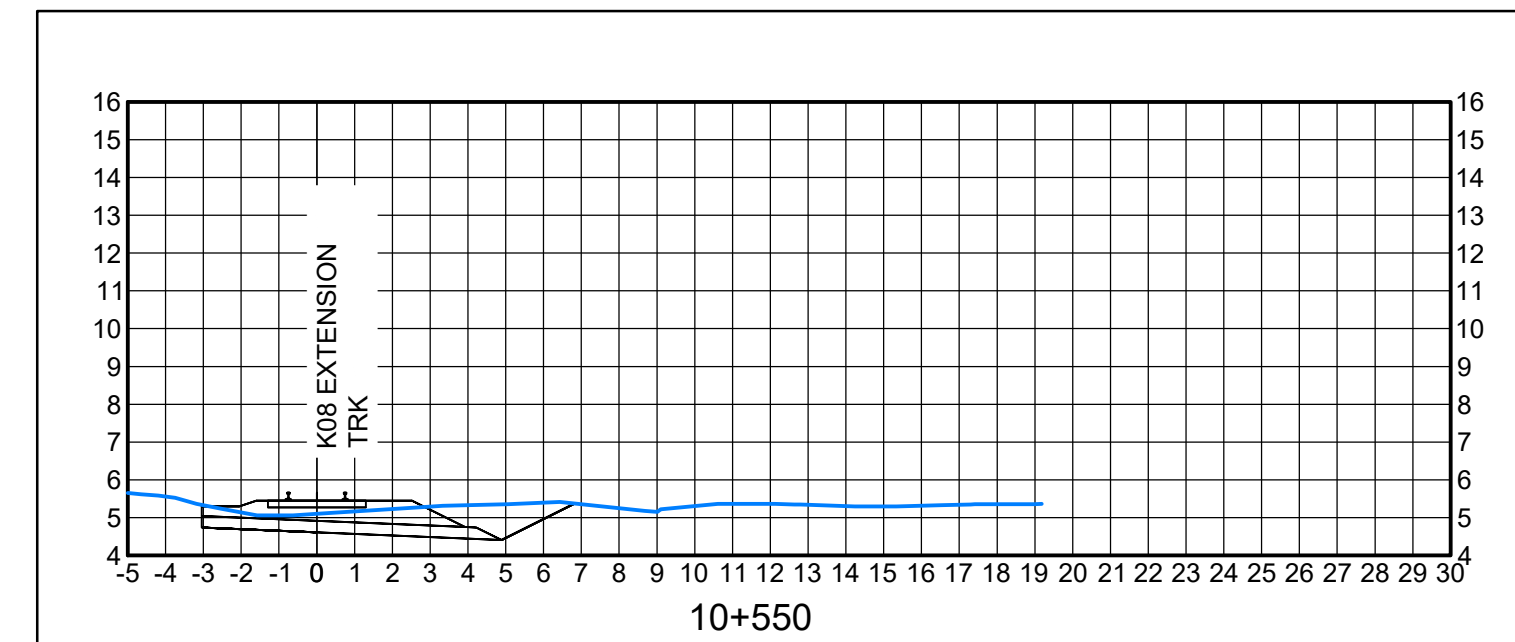
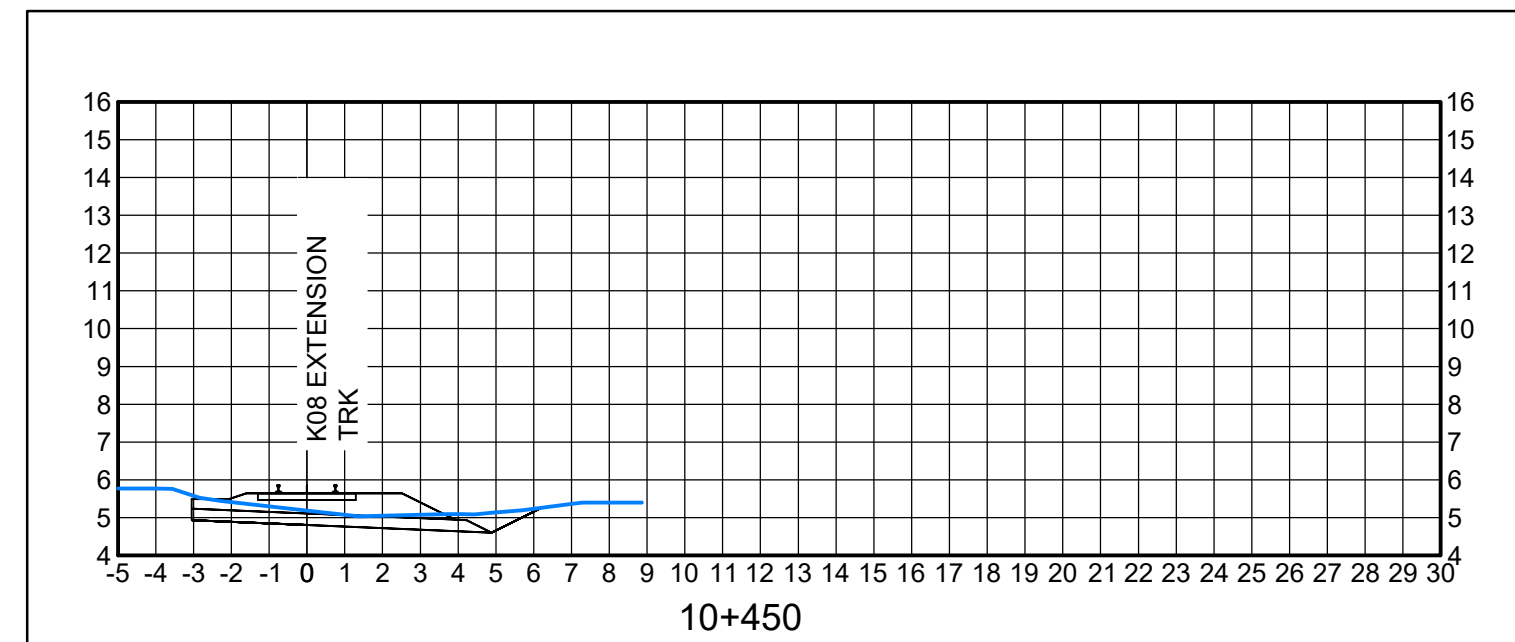
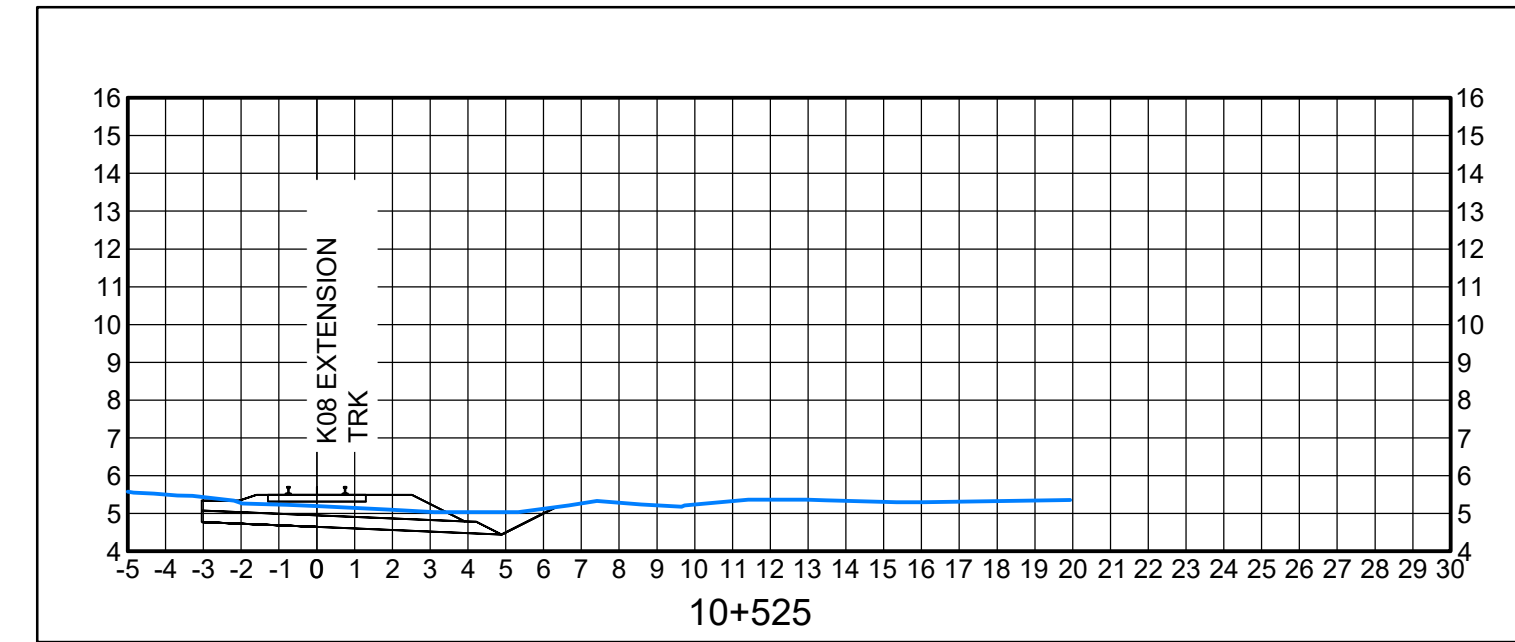
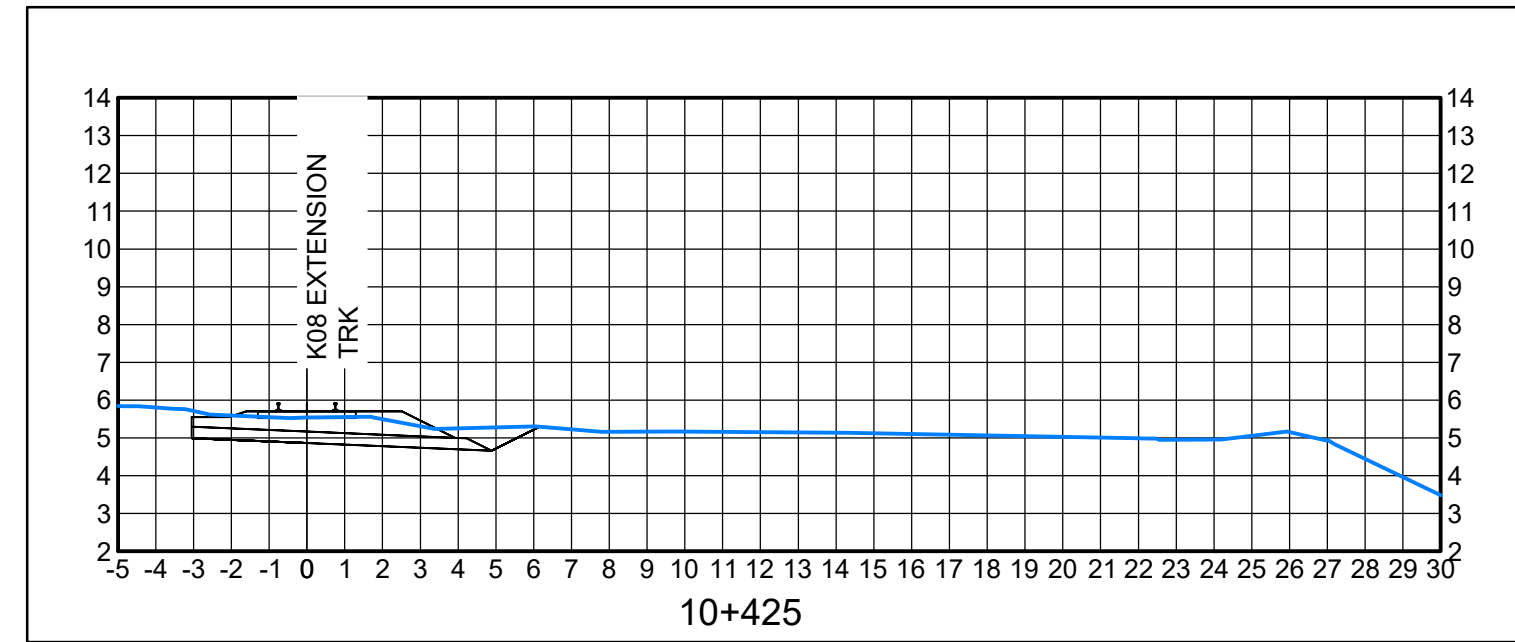
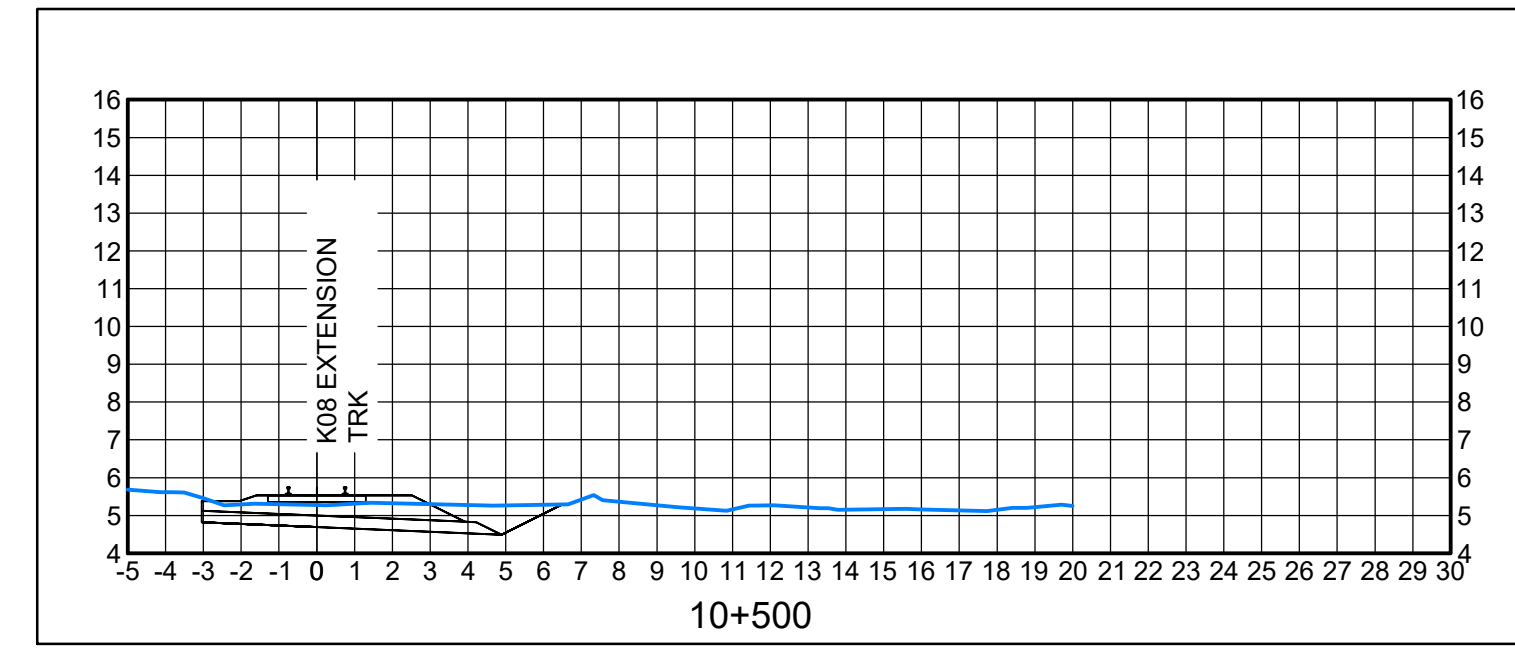
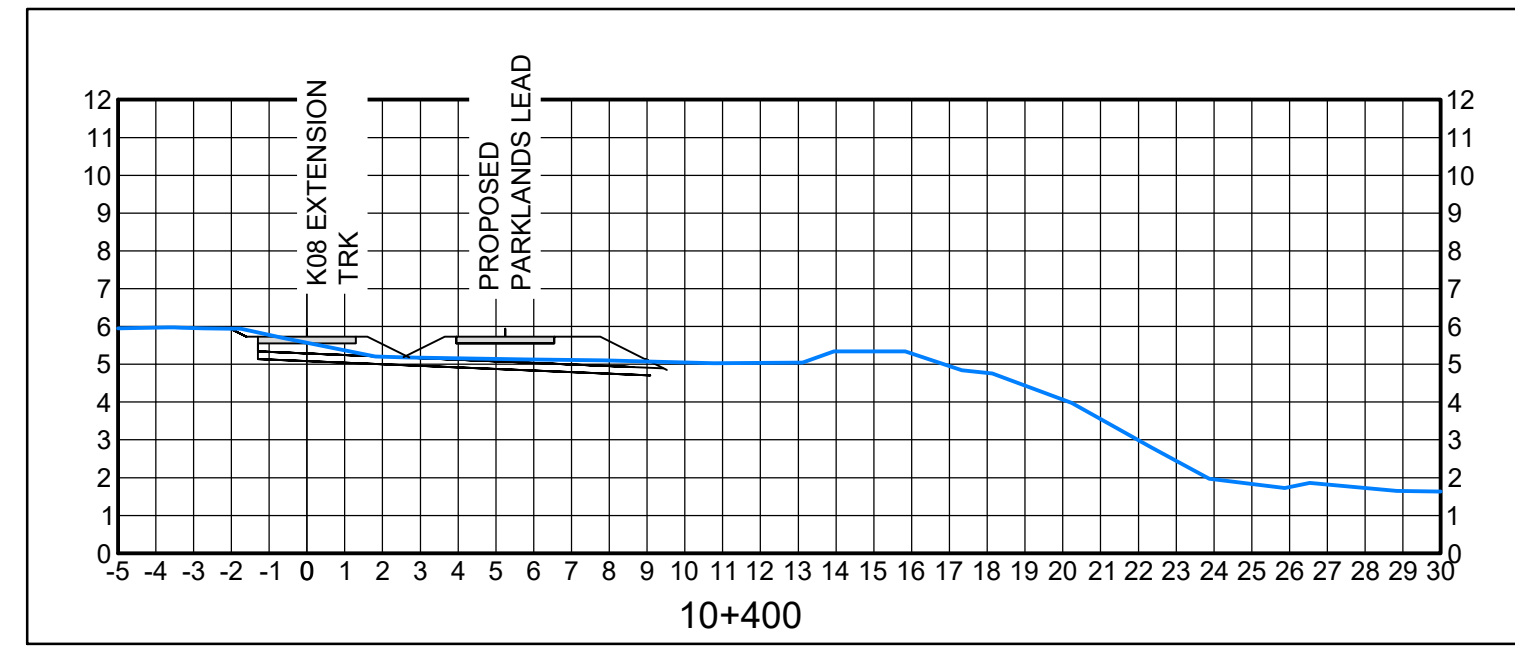
THIS DRAWING WAS PREPARED FOR THE EXCLUSIVE USE OF CANADIAN PACIFIC TOLENTY AND IS ISSUED PURSUANT TO THE WATCHDOG ENGINEERING SERVICES AGREEMENT AND RELIEVES PROFESSIONAL ENGINEERS, ARCHITECTS AND DESIGNERS OF LIABILITY FOR THE PROJECT. THESE ENGINEERS AGREE TO BE THE ONLY CLIENT OR SPECIES ON THIS DRAWING. NO PART OF THIS DRAWING OR ANY INFORMATION CONTAINED HEREIN IS TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT THE WRITTEN PERMISSION OF HATCH. HATCH DOES NOT ACCEPT AND DISCLAIMS ANY AND ALL LIABILITY OR RESPONSIBILITY ARISING FROM ANY USE OF OR RELIANCE ON THIS DRAWING BY ANY THIRD PARTY OR ANY MODIFICATION OR REVISION OF THIS DRAWING BY CLIENT AND BY THIS DRAWING IS CONFIDENTIAL AND ALL INTELLECTUAL PROPERTY RIGHTS, TRADEMARKS OR REFERENCES IN THIS DRAWING REMAIN THE PROPERTY OF HATCH.

No.	DATE	REVISION	BY
B	20-09-01	ISSUED FOR INFORMATION ONLY - DRAFT	T.I.
A	20-08-14	ISSUED FOR INFORMATION ONLY - DRAFT	T.I.

**CP**

ENGINEERING PROJECTS - WEST

VANCOUVER DIVISION		MILE 122.93 TO 124.16 CASCADE SUBDIVISION	
<b>CASCADIA EAST EXTENSION - PHASE 4 PROPOSED SIDING EXTENSION OPTION 1 SECTIONS</b>			
DWG. BY:	CHK BY:	OFFICE FILE:	
MANAGER - DESIGN:		SCALE:	
M. FAVREAU		DATE:	
DIR, PROJECTS & PUBLIC WORKS - WEST		PLAN No.	
		362379-RW-100-S0-301	
			Rev.
			B



**DRAFT**  
DATE:

Sep 01, 2020, 1:23pm Login name: IMAM872934 Drawing Name: C:\pwworking\hatch\imam872934\0693339\Sections For Collier.dwg

**HATCH**

METRIC  
DIMENSIONS ARE IN METRES AND/OR MILLIMETRES  
UNLESS OTHERWISE NOTED

DESIGNED BY:	DRAWN BY:
T.I.	T.I.
DATE: 20-07-20	DATE: 20-07-20
CHECKED BY:	PROJECT MANAGER:
J.C.	T.I.
DATE: 20-07-20	DATE: 20-07-20
HATCH PROJECT No:	DWG SCALE(FULL SIZE):
362379	1:2000

PROFESSIONAL SEALS

THIS DRAWING WAS PREPARED FOR THE EXCLUSIVE USE OF CANADIAN PACIFIC TOLENTY AND IS ISSUED PURSUANT TO THE WATCHDOG ENGINEERING SERVICES AGREEMENT AND RELEASES ENGINEERING SERVICES TOLENTY AND ENGINEERING SERVICES TOLENTY FROM ALL LIABILITY OR RESPONSIBILITY ARISING FROM ANY USE OF OR RELIANCE ON THIS DRAWING, AS A WATCHDOG ENGINEERING SERVICES TOLENTY AND ENGINEERING SERVICES TOLENTY DOES NOT ACCEPT AND DISCLAIMS ANY AND ALL LIABILITY OR RESPONSIBILITY ARISING FROM ANY USE OF OR RELIANCE ON THIS DRAWING BY ANY THIRD PARTY OR ANY MODIFICATION OR REVISIONS OR REVISIONS IN THIS DRAWING REMAIN THE PROPERTY OF HATCH.	
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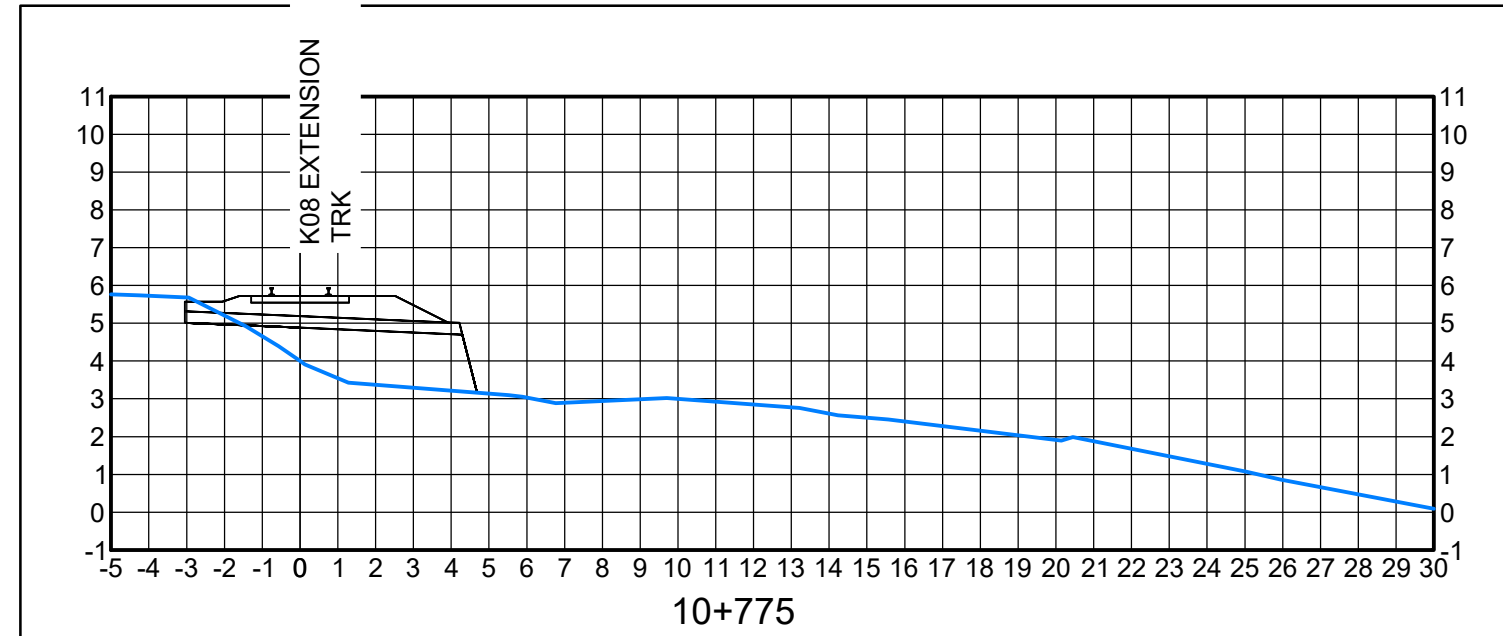
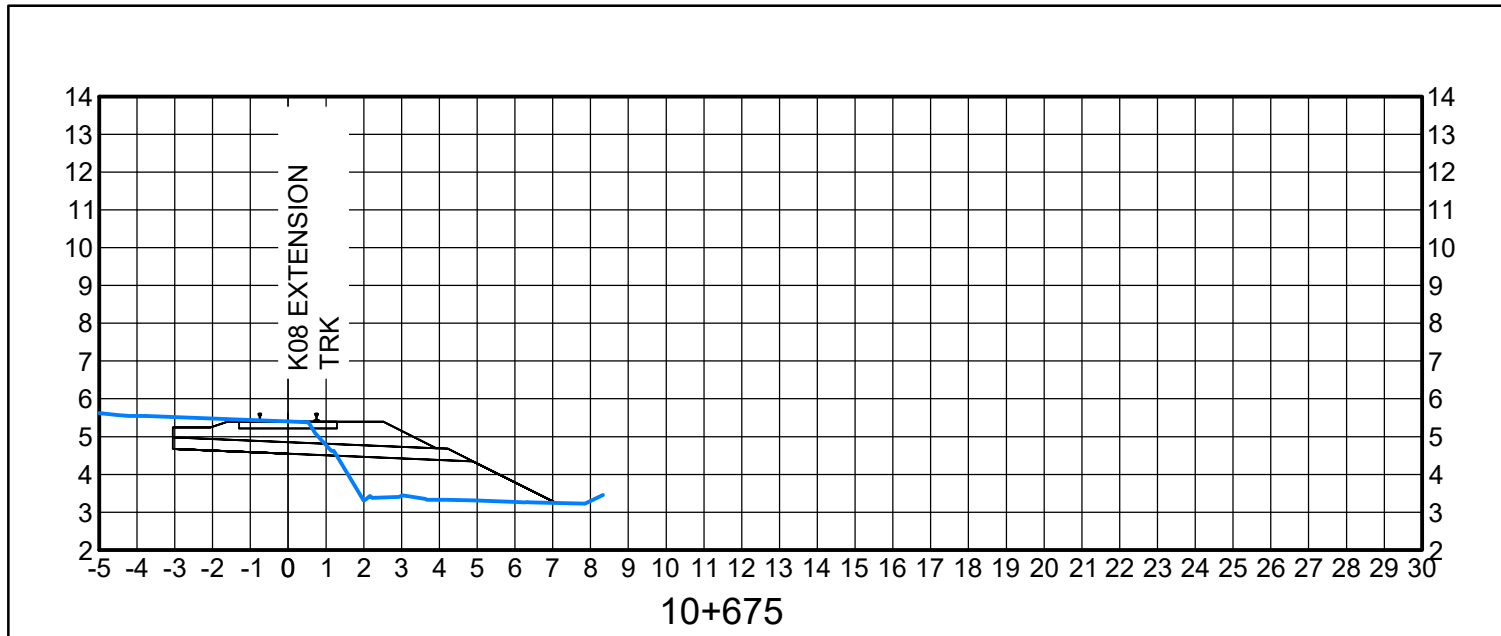
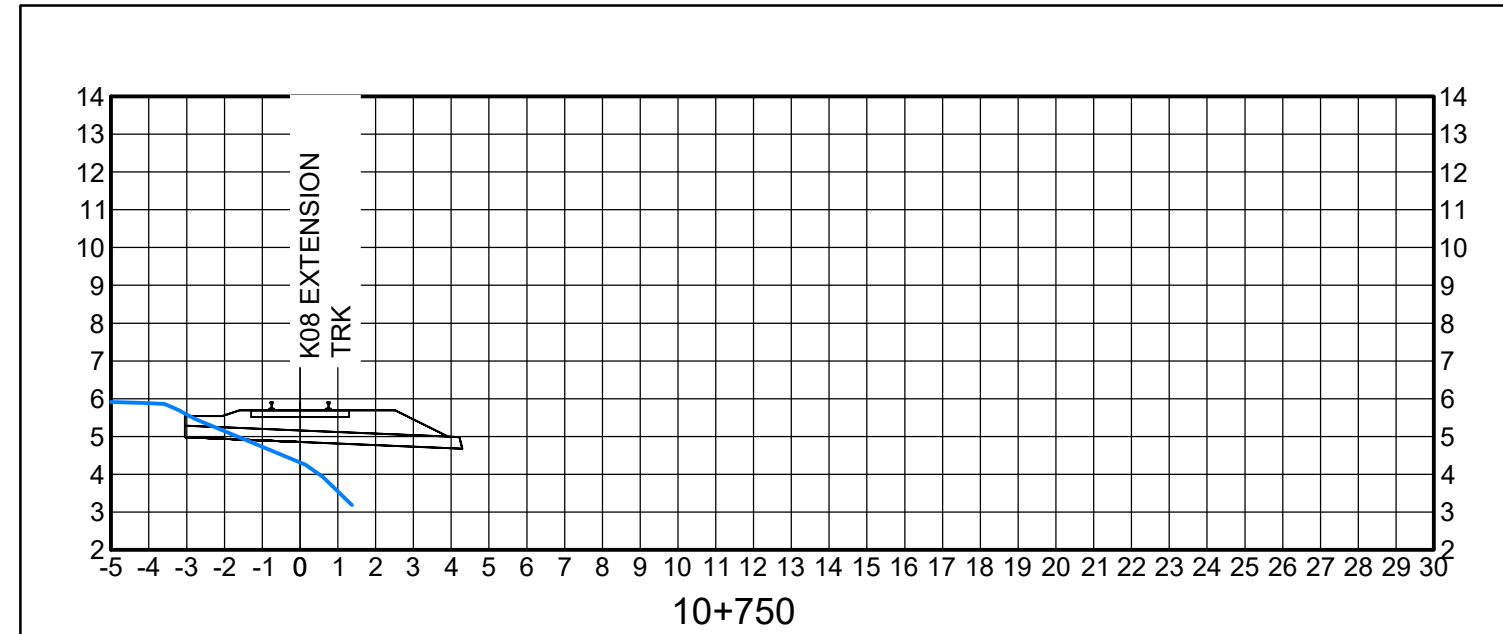
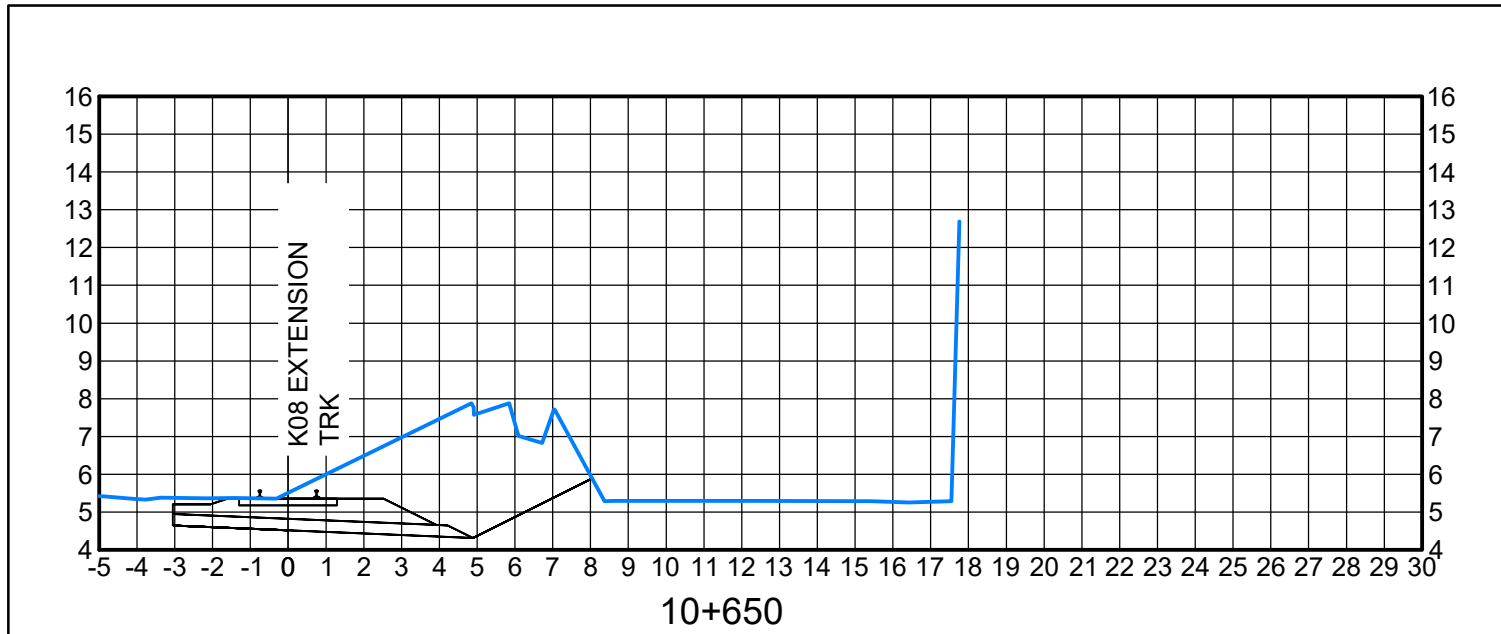
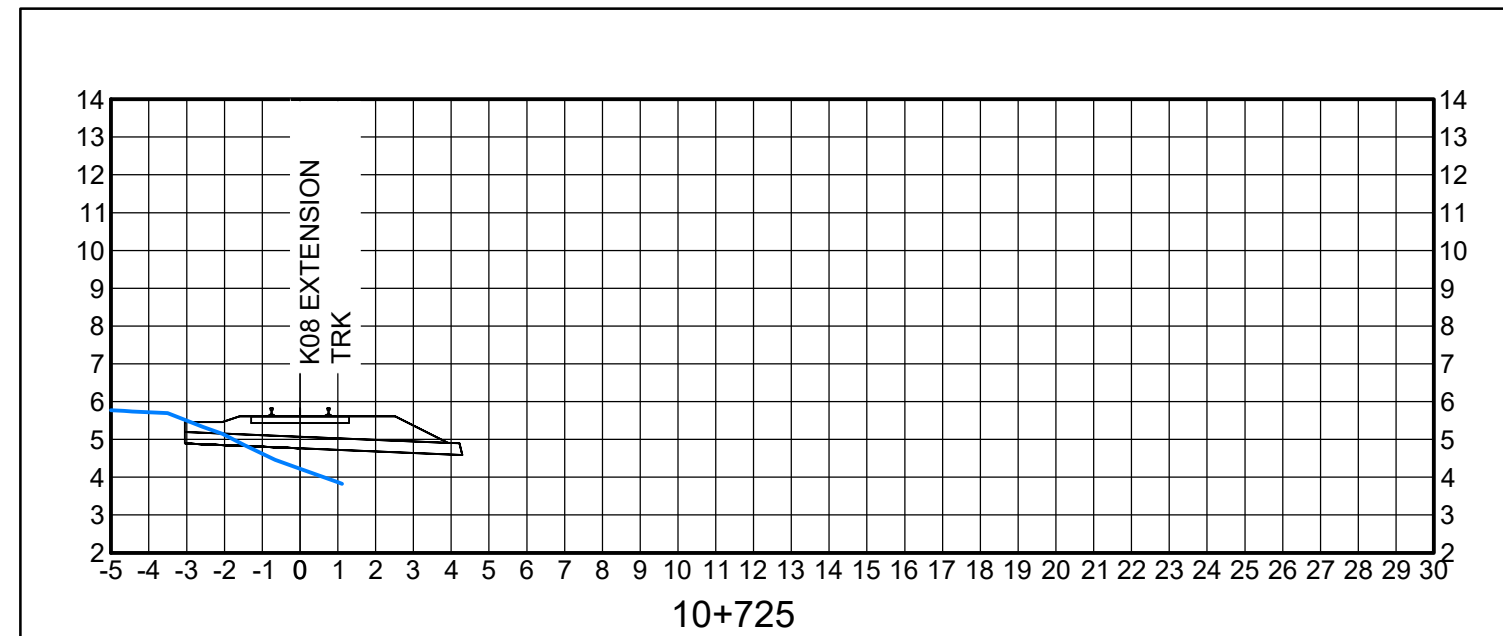
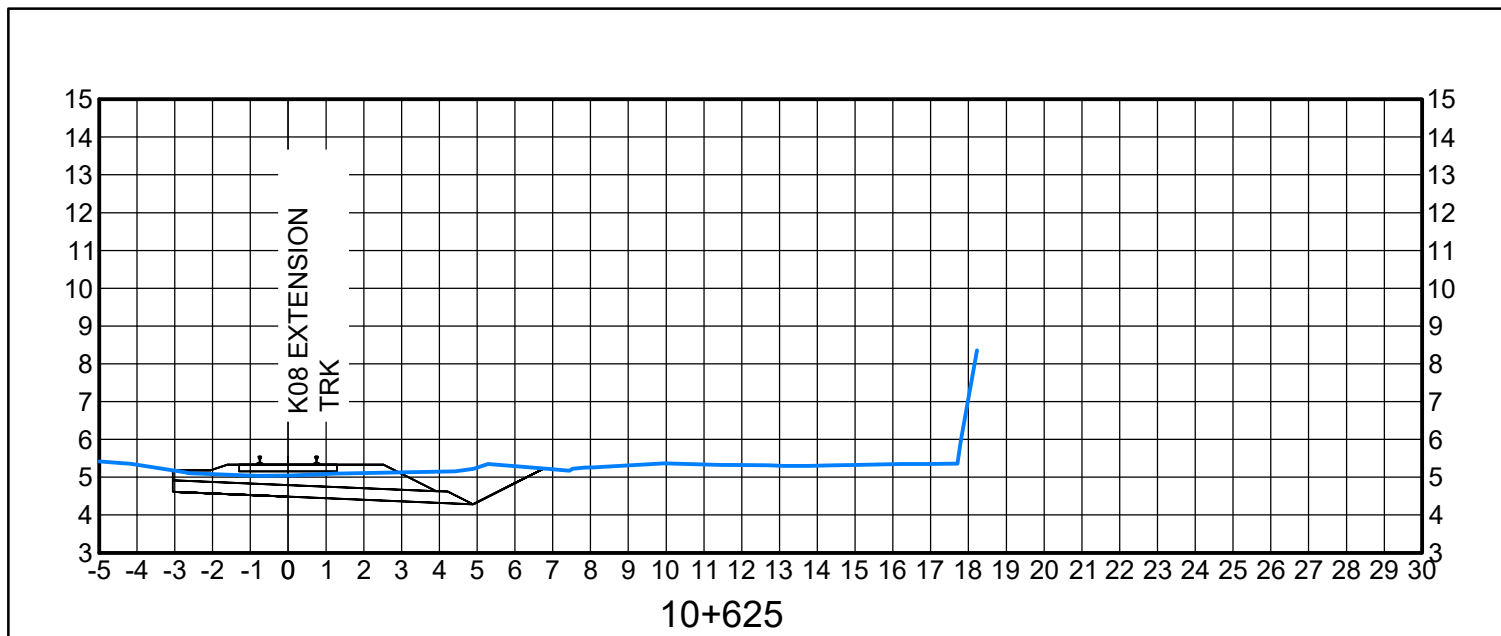
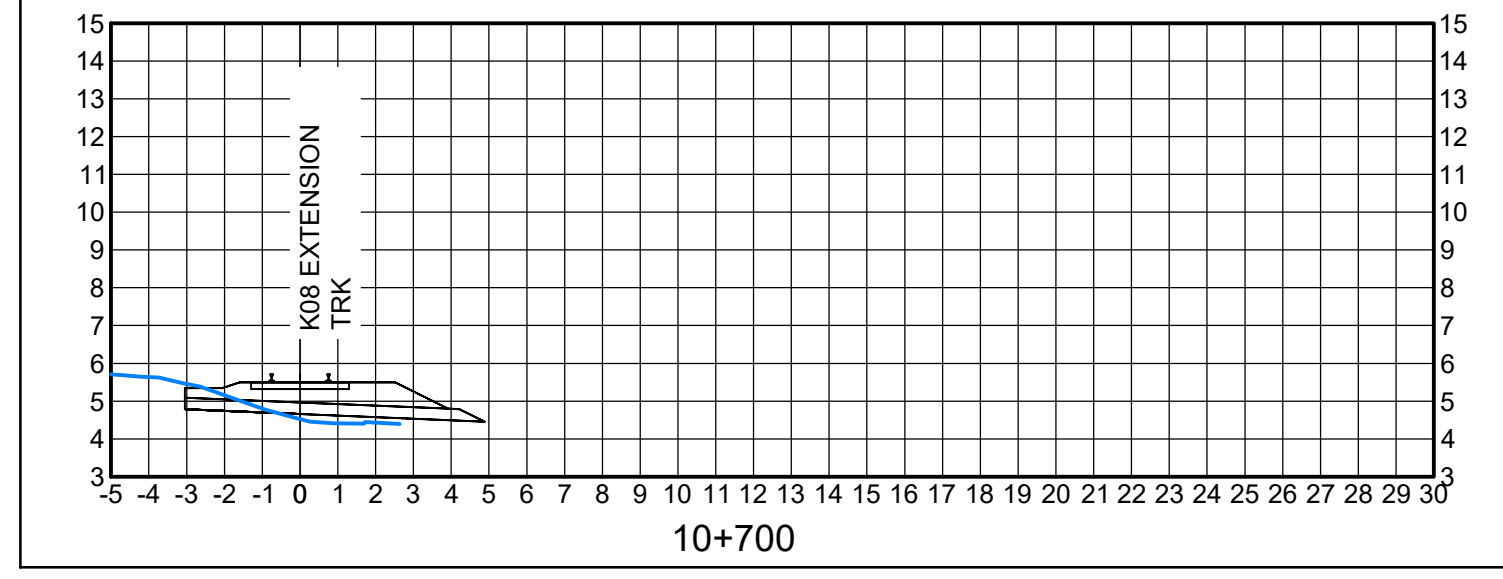
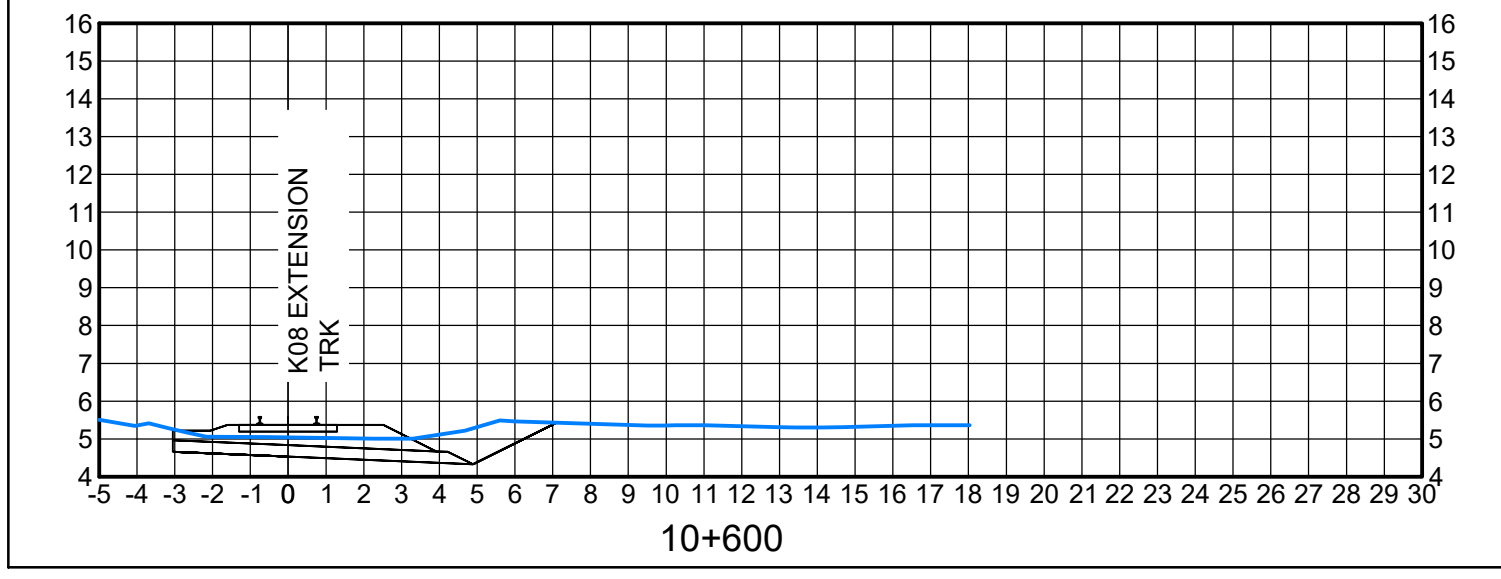
No.	DATE	REVISION	BY
B	20-09-01	ISSUED FOR INFORMATION ONLY - DRAFT	T.I.
A	20-08-14	ISSUED FOR INFORMATION ONLY - DRAFT	T.I.

**CP**

ENGINEERING PROJECTS - WEST

VANCOUVER DIVISION		MILE 122.93 TO 124.16 CASCADE SUBDIVISION	
<b>CASCADIA EAST EXTENSION - PHASE 4 PROPOSED SIDING EXTENSION OPTION 1 SECTIONS</b>			
DWG. BY:	CHK BY:	OFFICE FILE:	
MANAGER - DESIGN:		SCALE:	
M. FAVREAU		DATE:	
DIR, PROJECTS & PUBLIC WORKS - WEST		PLAN No.	
		362379-RW-100-S0-302	
			Rev.
			B





**DRAFT**  
DATE:

Sep 01, 2020, 1:23pm Login name: IMAM872934 Drawing Name: C:\pwworking\hatch\imam872934\0693839\Sections For Collier.dwg

**HATCH**  
METRIC  
DIMENSIONS ARE IN METRES AND/OR MILLIMETRES  
UNLESS OTHERWISE NOTED

DESIGNED BY:	DRAWN BY:
T.I.	T.I.
DATE: 20-07-20	DATE: 20-07-20
CHECKED BY:	PROJECT MANAGER:
J.C.	T.I.
DATE: 20-07-20	DATE: 20-07-20
HATCH PROJECT No:	DWG SCALE(FULL SIZE):
362379	1:2000

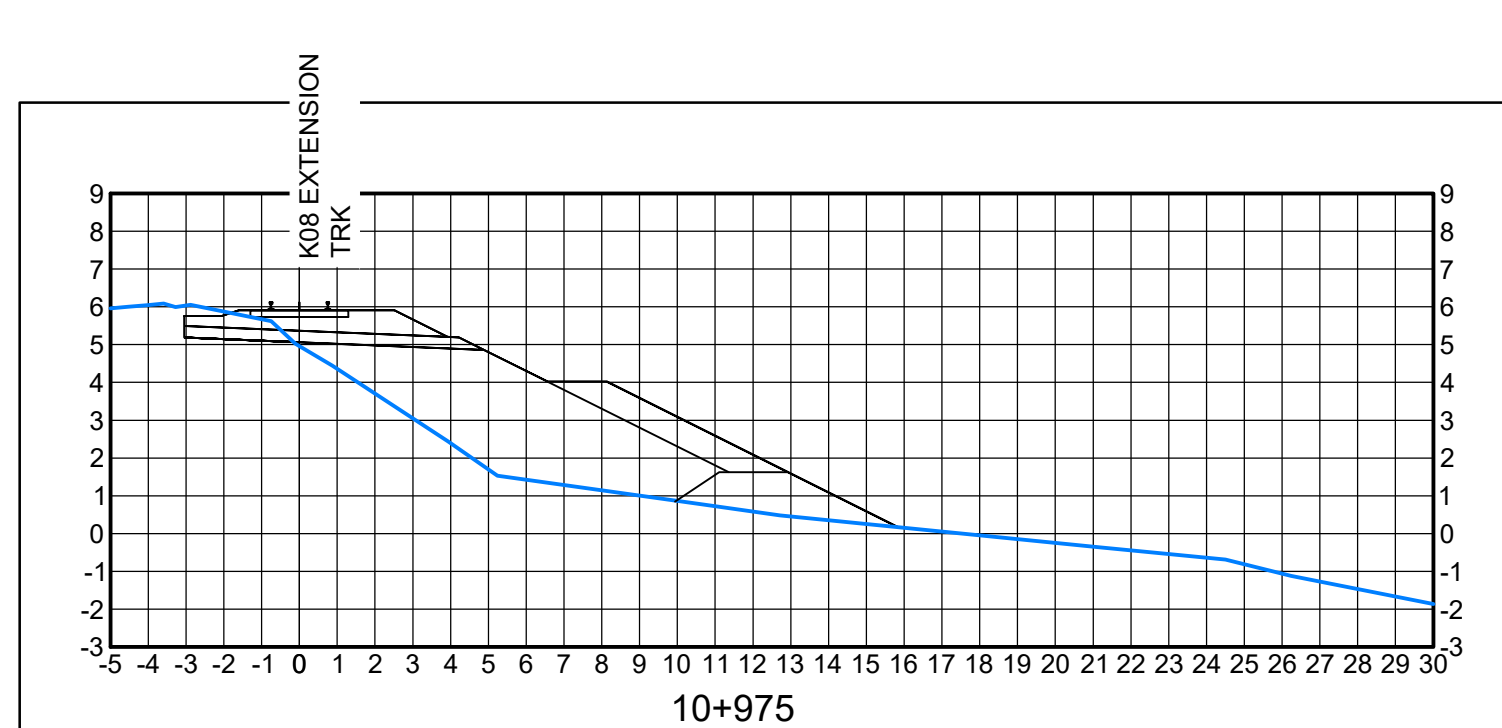
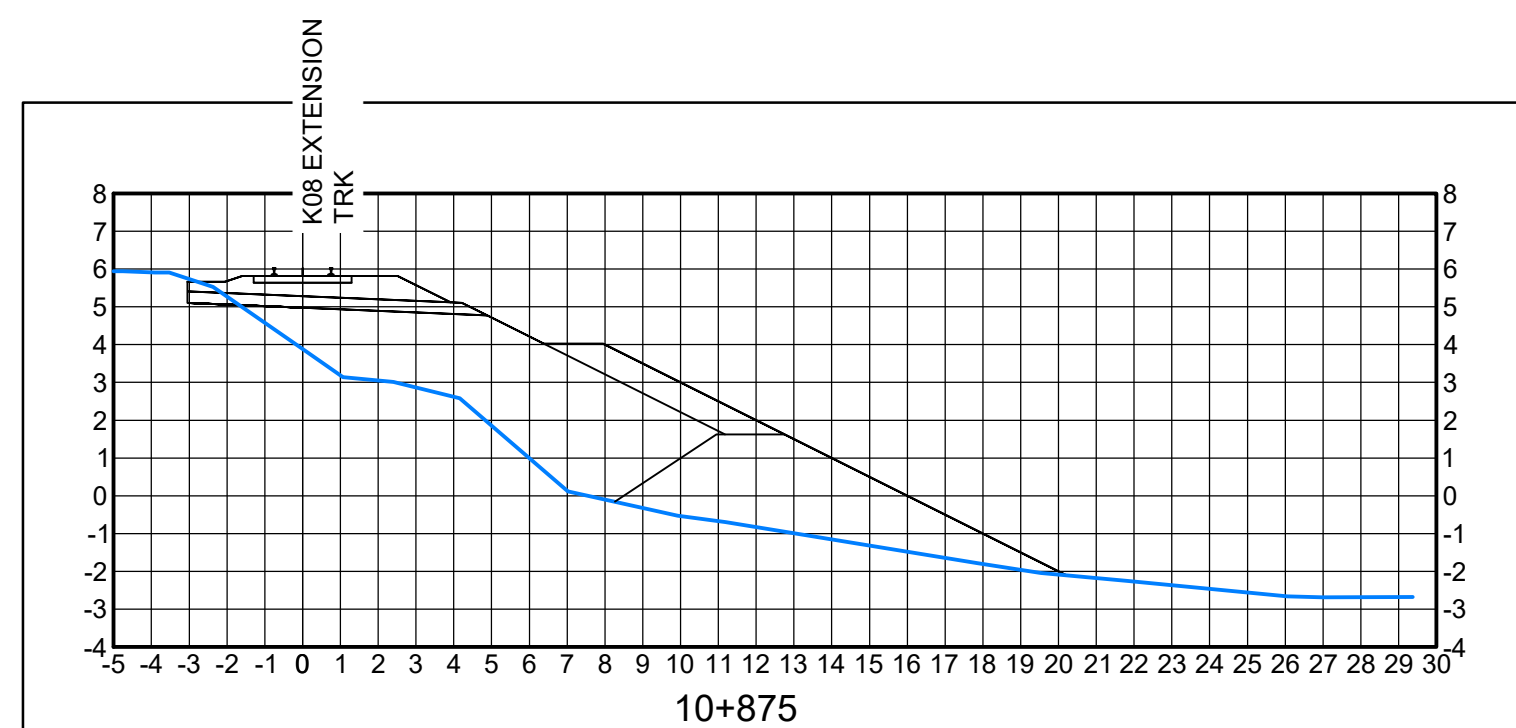
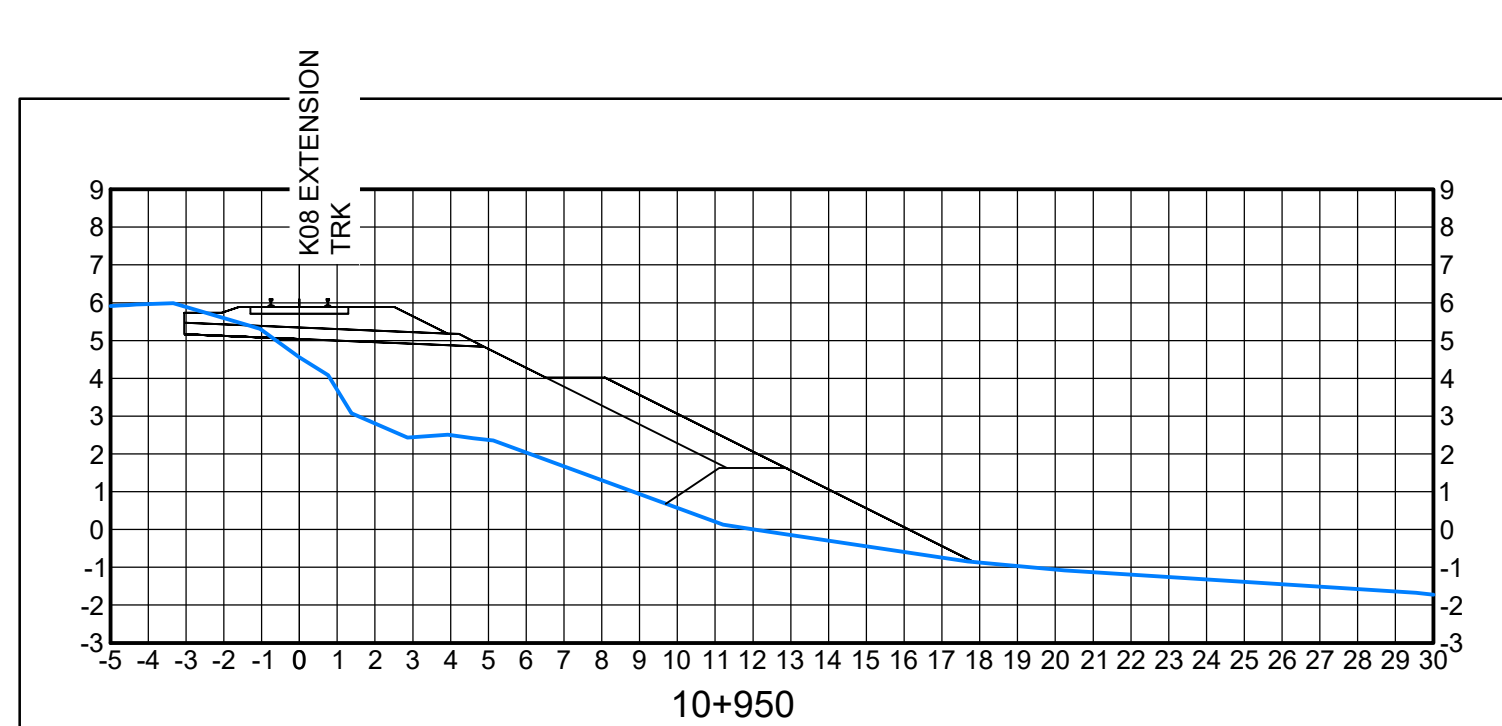
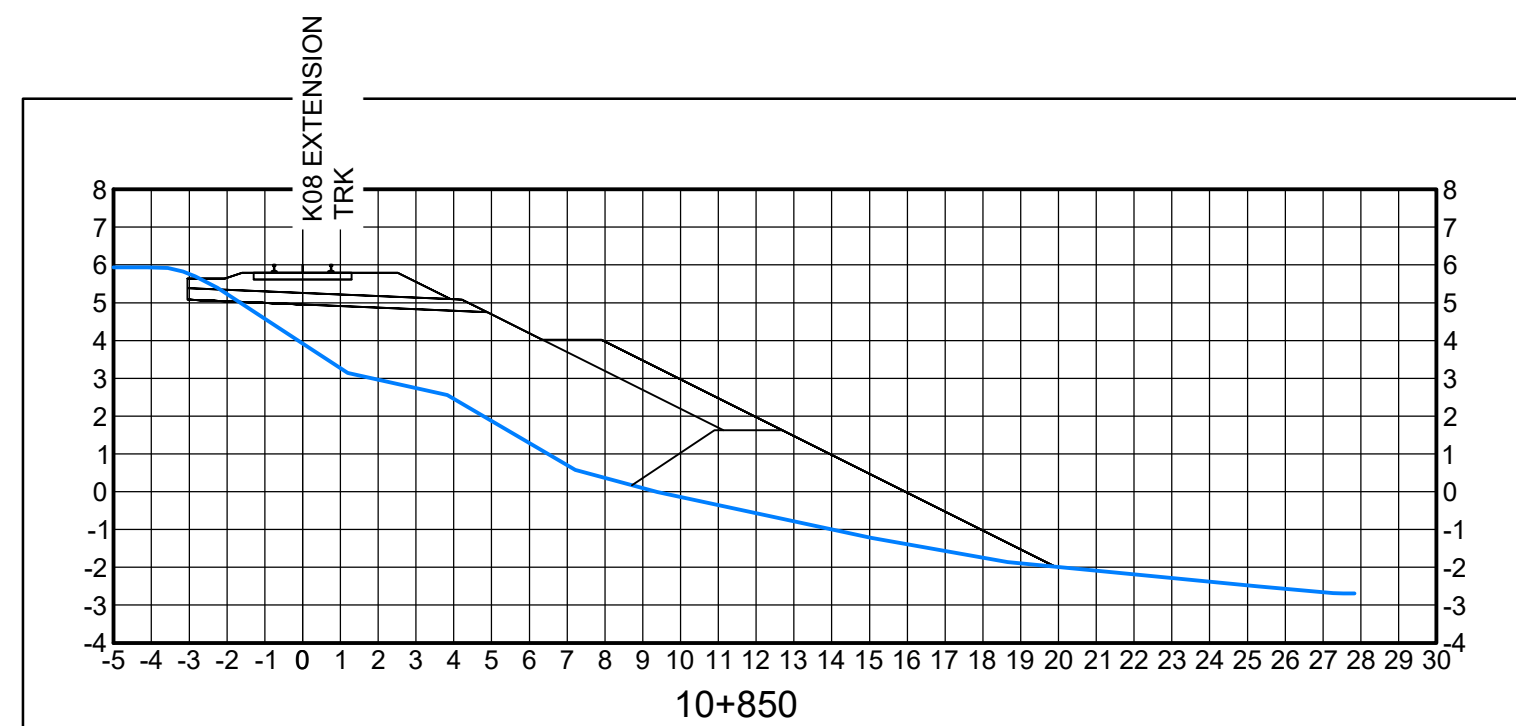
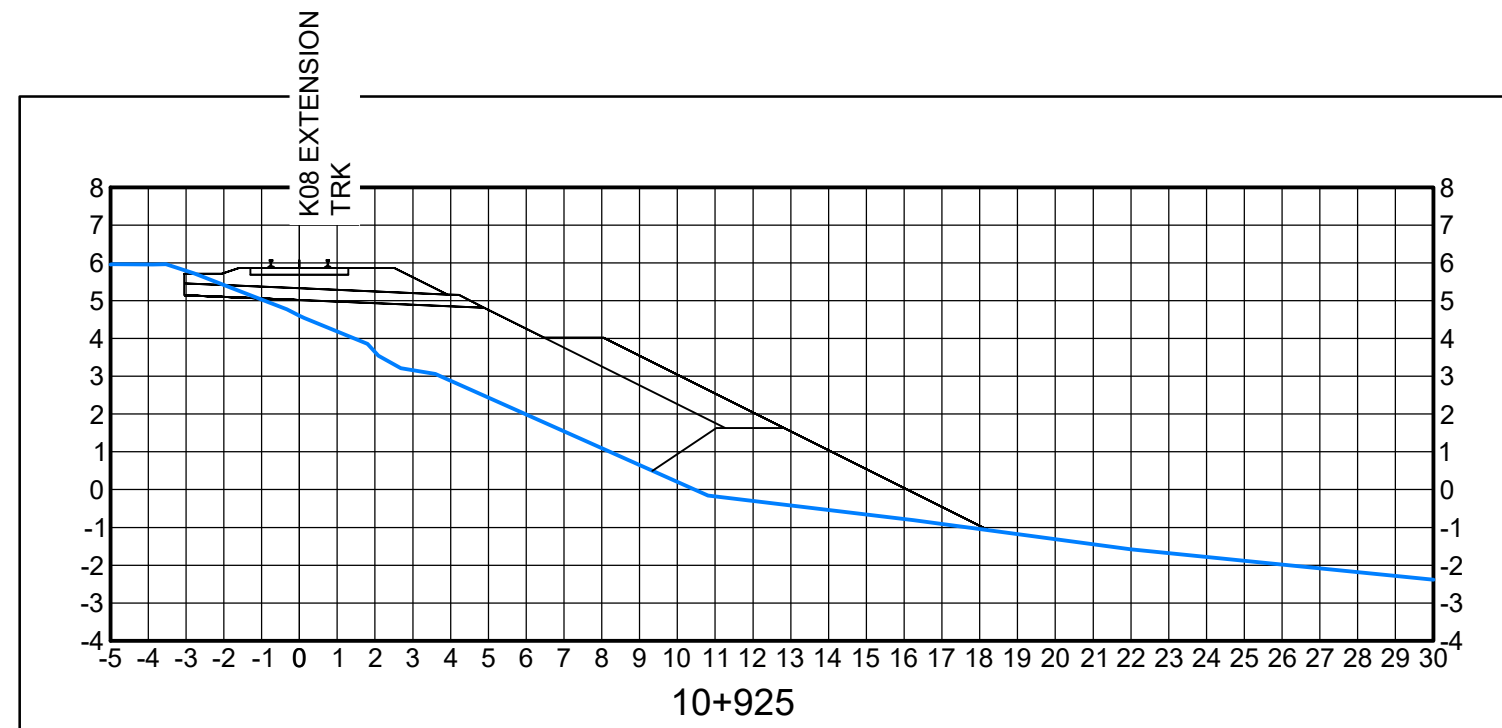
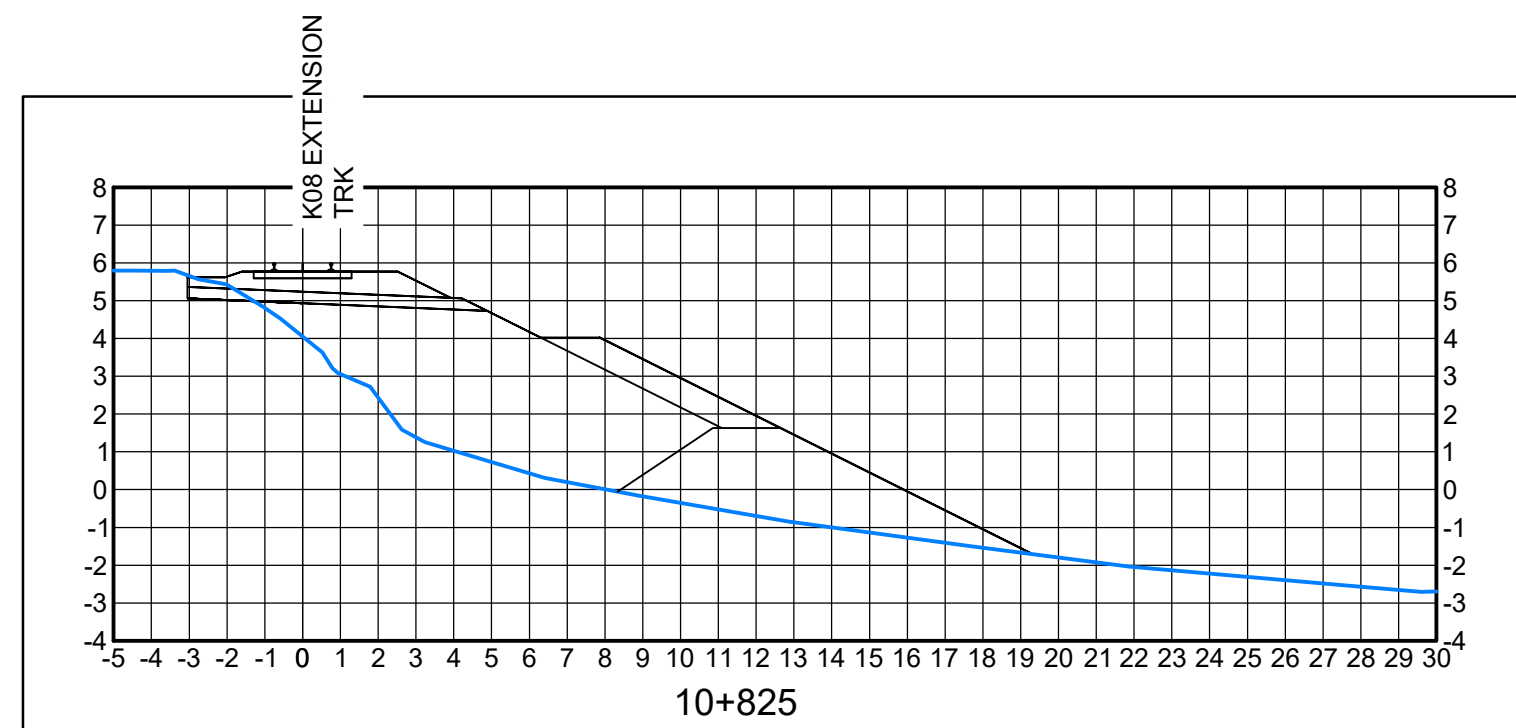
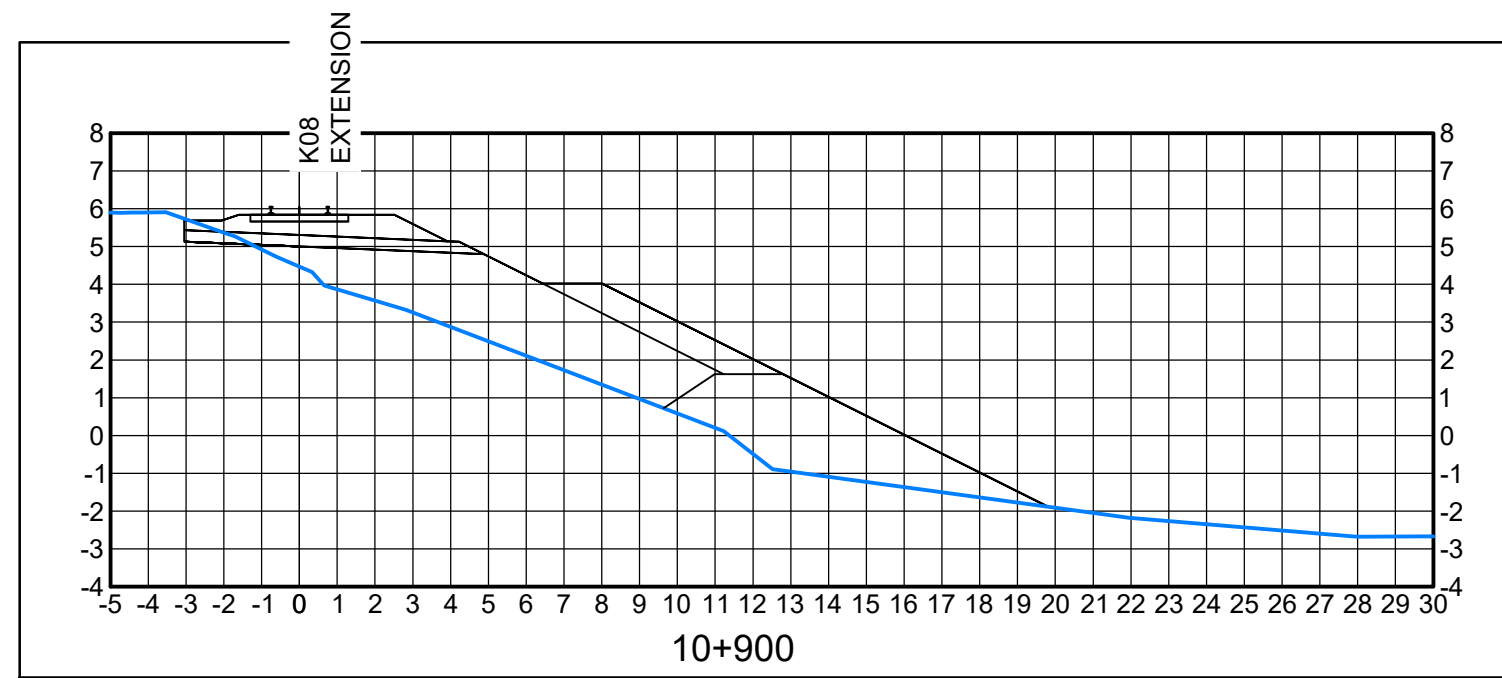
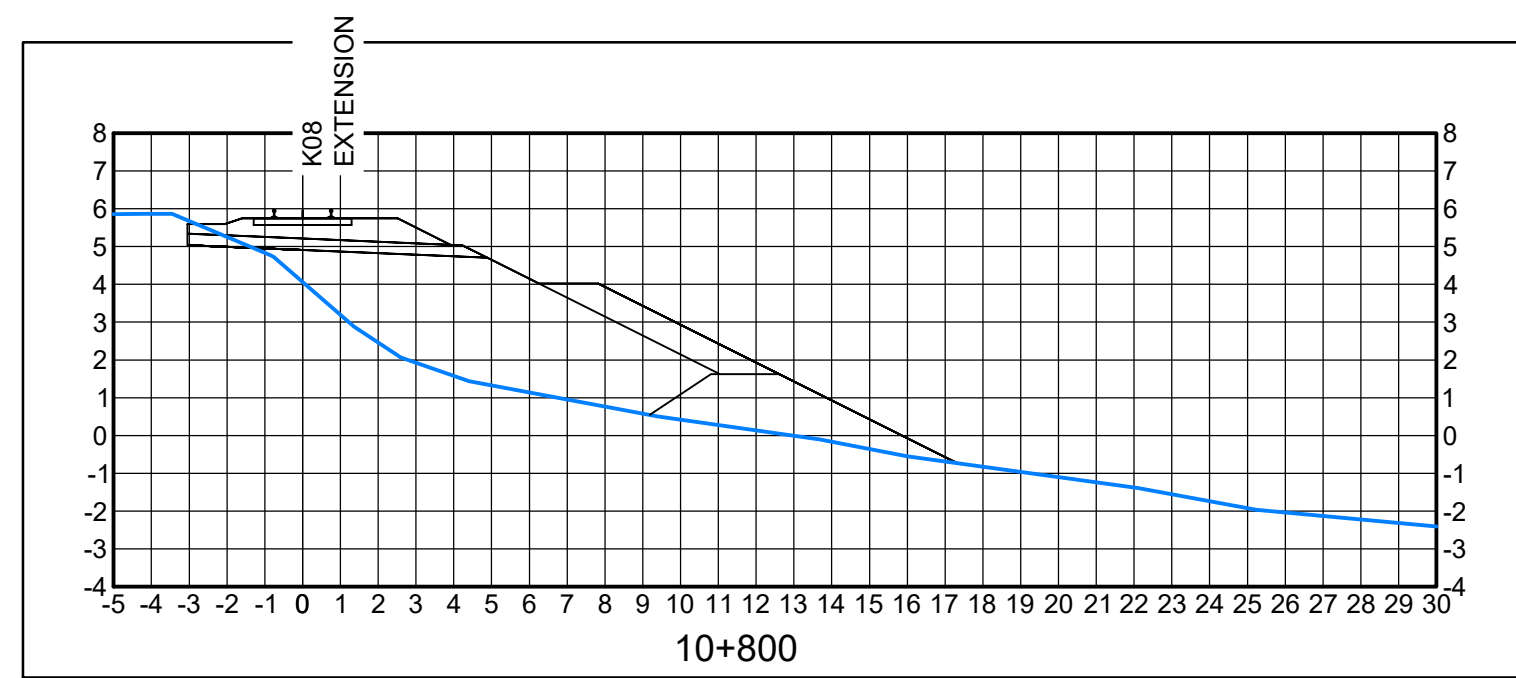
PROFESSIONAL SEALS

THIS DRAWING WAS PREPARED FOR THE EXCLUSIVE USE OF CANADIAN PACIFIC TOLENTY AND IS ISSUED PURSUANT TO THE HATCH ENGINEERING SERVICES AGREEMENT AND HATCH ENGINEERING SERVICES TERMS, CONDITIONS AND NOTICE OF CONFIDENTIALITY. THESE TERMS APPLY TO THIS DRAWING. HATCH DOES NOT ACCEPT AND DISCLAIMS ANY AND ALL LIABILITY OR RESPONSIBILITY ARISING FROM ANY USE OF OR RELIANCE ON THIS DRAWING BY ANY THIRD PARTY OR ANY MODIFICATION OR REVISIONS OR REPERFORMS IN THIS DRAWING REMAIN THE PROPERTY OF HATCH.

No.	DATE	REVISION	BY
B	20-09-01	ISSUED FOR INFORMATION ONLY - DRAFT	T.I.
A	20-08-14	ISSUED FOR INFORMATION ONLY - DRAFT	T.I.



VANCOUVER DIVISION		MILE 122.93 TO 124.16 CASCADE SUBDIVISION	
<b>CASCADIA EAST EXTENSION - PHASE 4 PROPOSED SIDING EXTENSION OPTION 1 SECTIONS</b>			
DWG. BY:	CHK BY:	OFFICE FILE:	
MANAGER - DESIGN:		SCALE:	
		DATE:	
		PLAN No.	
M. FAVREAU DIR. PROJECTS & PUBLIC WORKS - WEST		362379-RW-100-S0-303	
			Rev. <b>B</b>



**DRAFT**  
DATE:

**HATCH**

METRIC  
 DIMENSIONS ARE IN METRES AND/OR MILLIMETRES  
 UNLESS OTHERWISE NOTED

DESIGNED BY:	DRAWN BY:
T.I. DATE: 20-07-20	T.I. DATE: 20-07-20
CHECKED BY:	PROJECT MANAGER:
J.C. DATE: 20-07-20	J.L. DATE: 20-07-20
HATCH PROJECT No:	DWG SCALE(FULL SIZE):
<b>362379</b>	<b>1:2000</b>

PROFESSIONAL SEALS

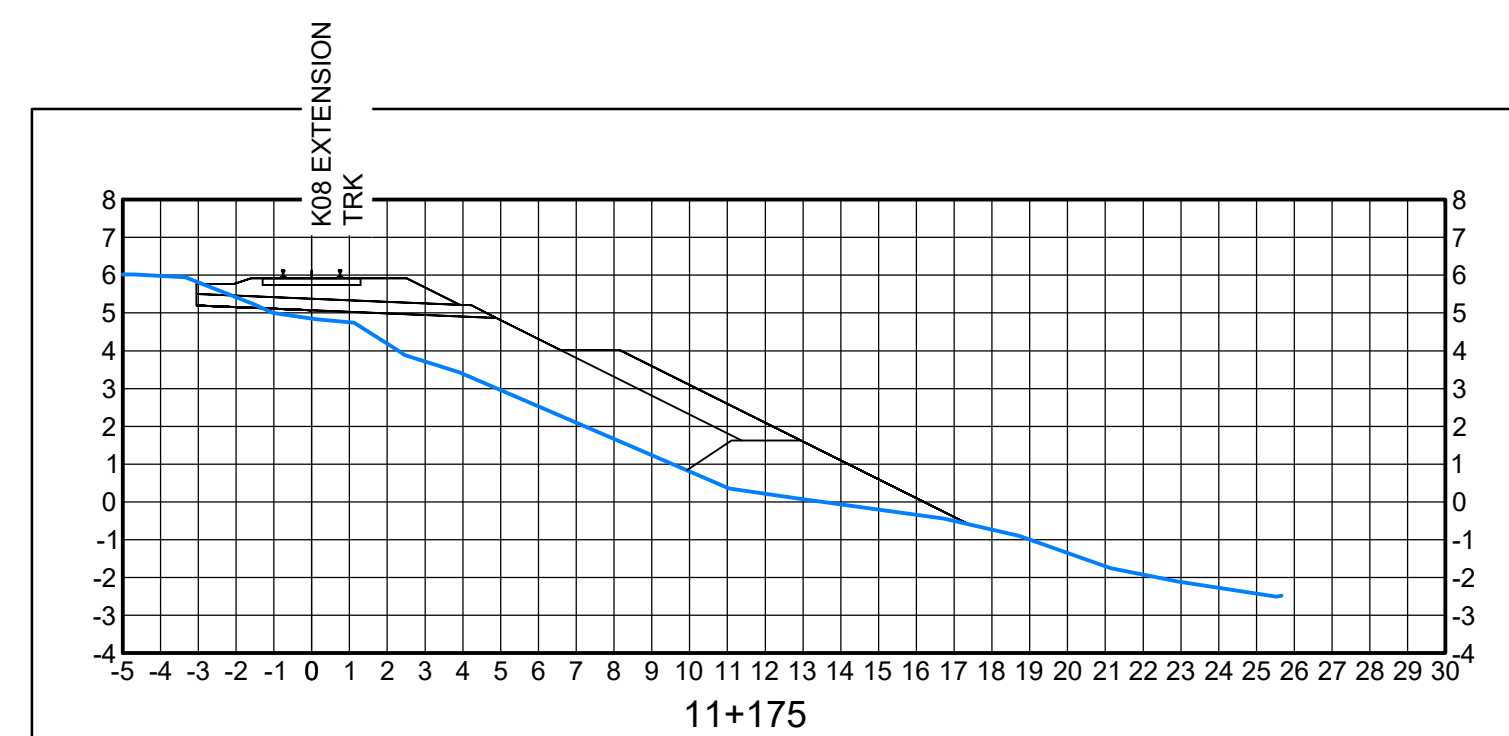
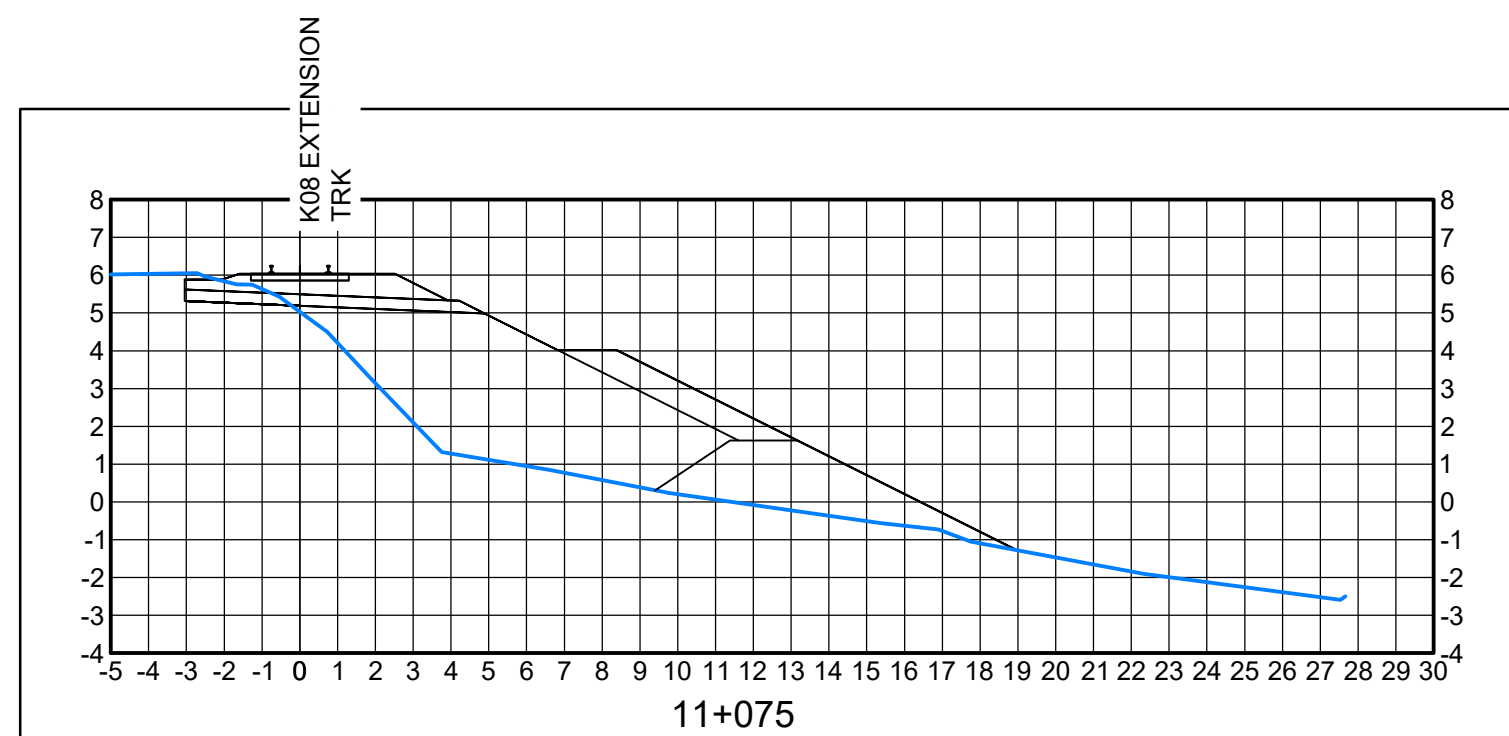
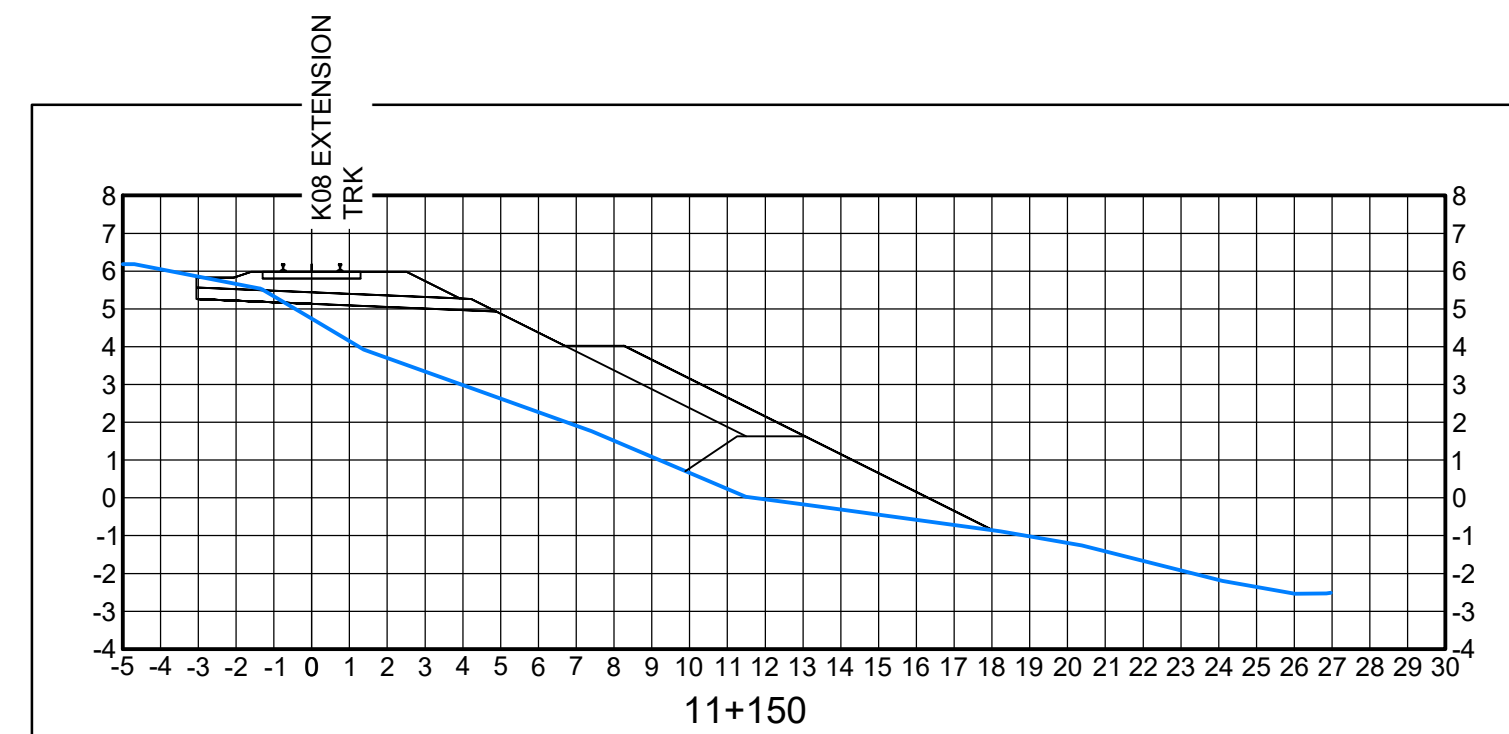
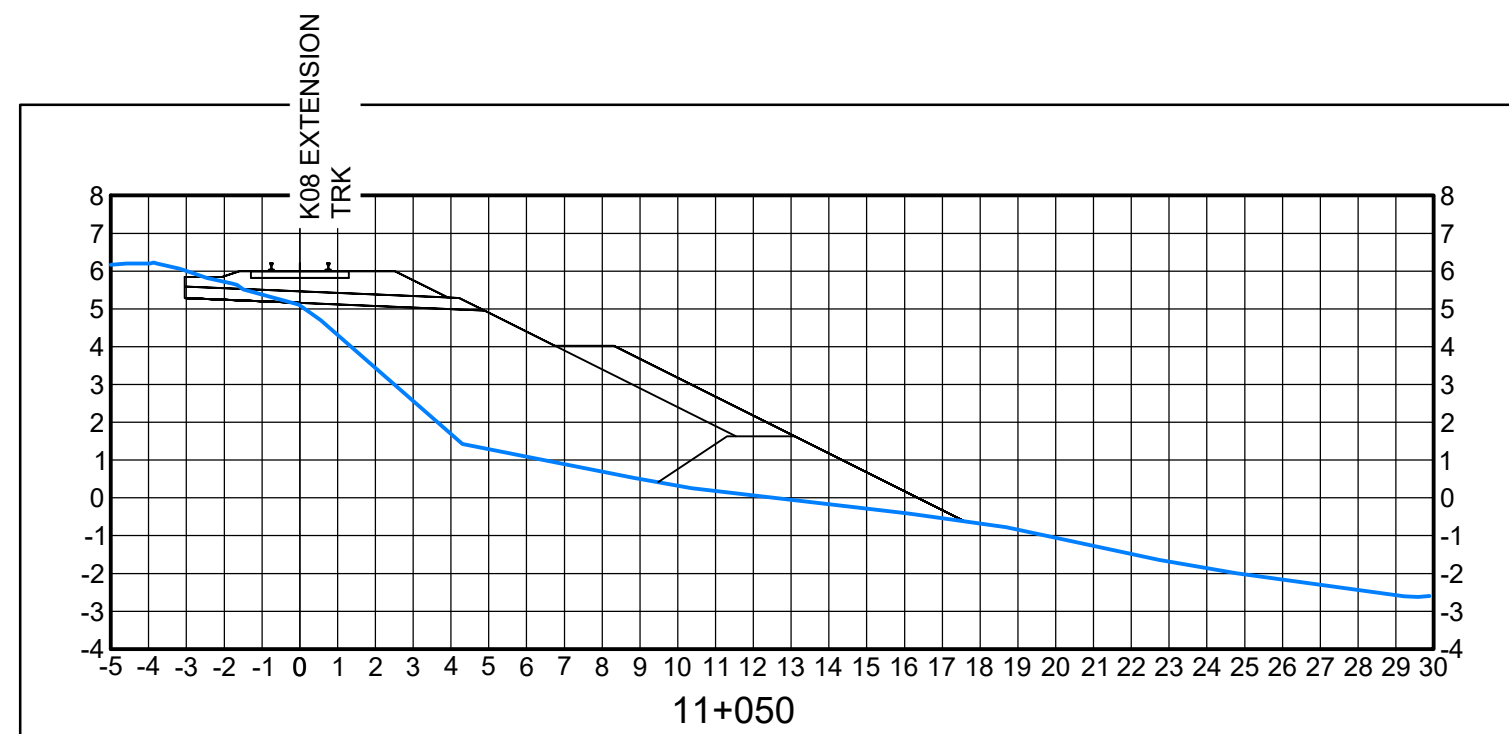
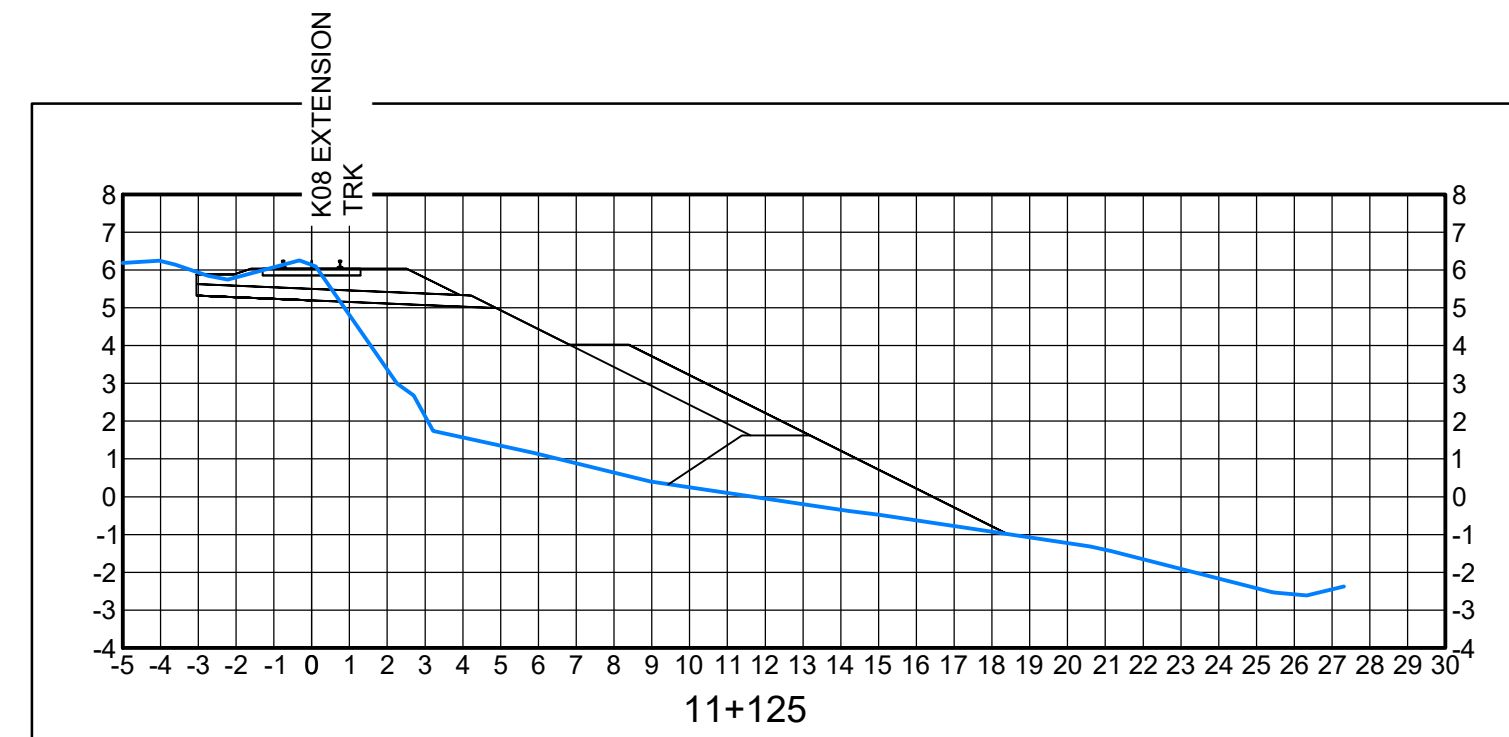
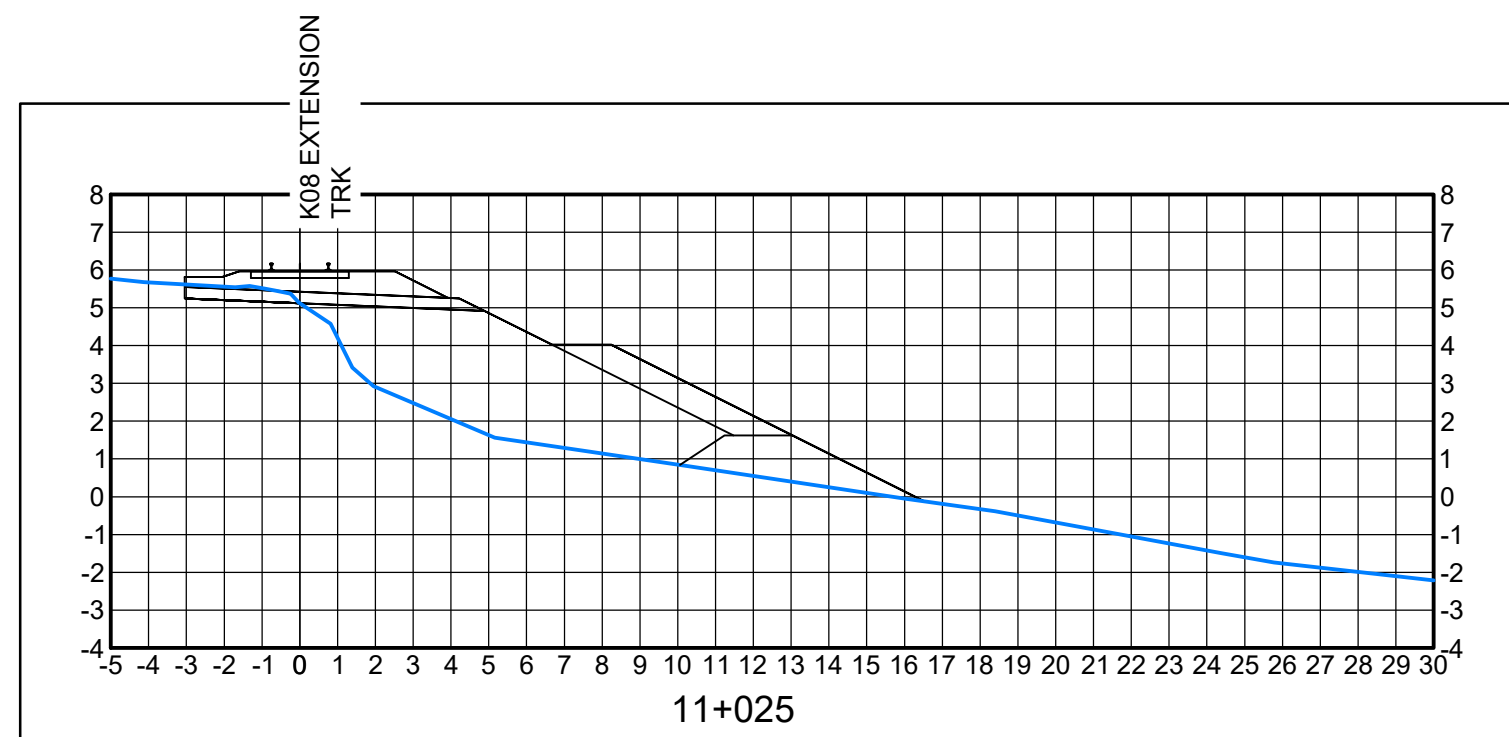
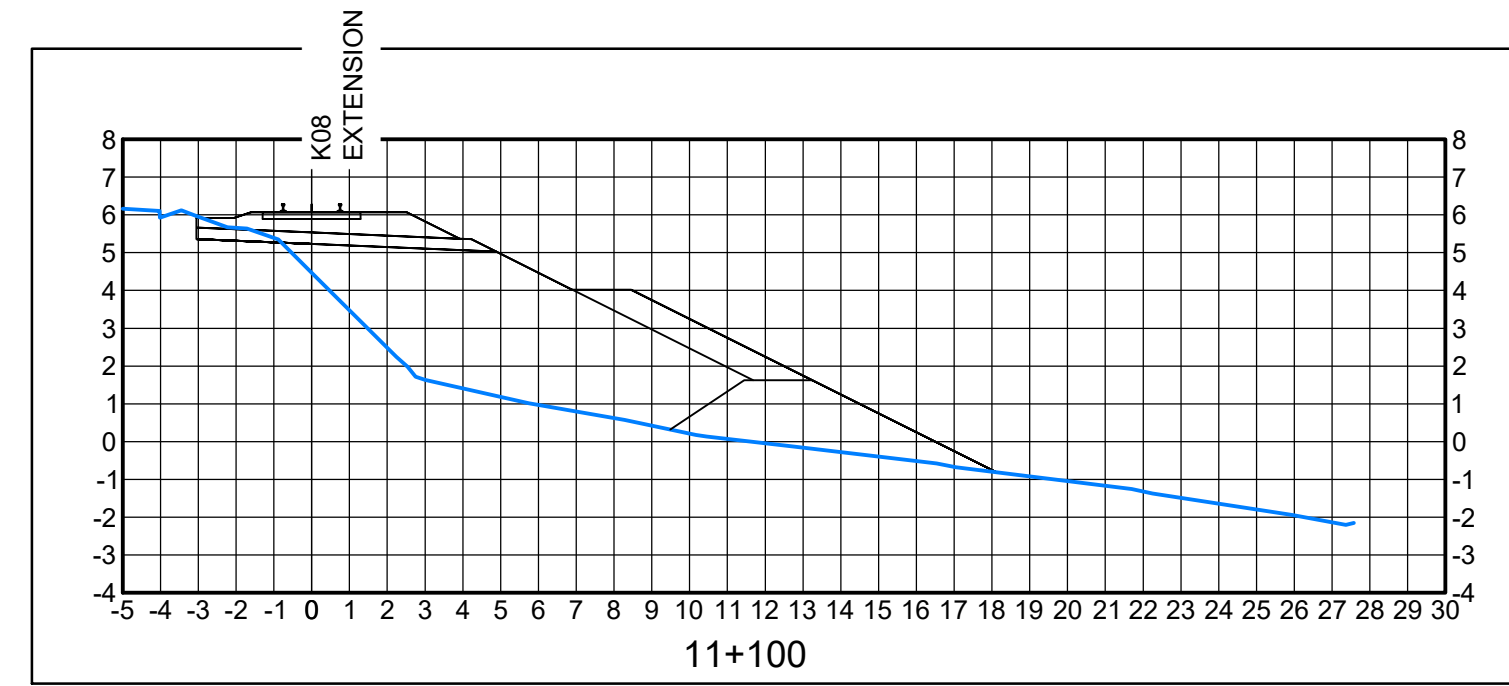
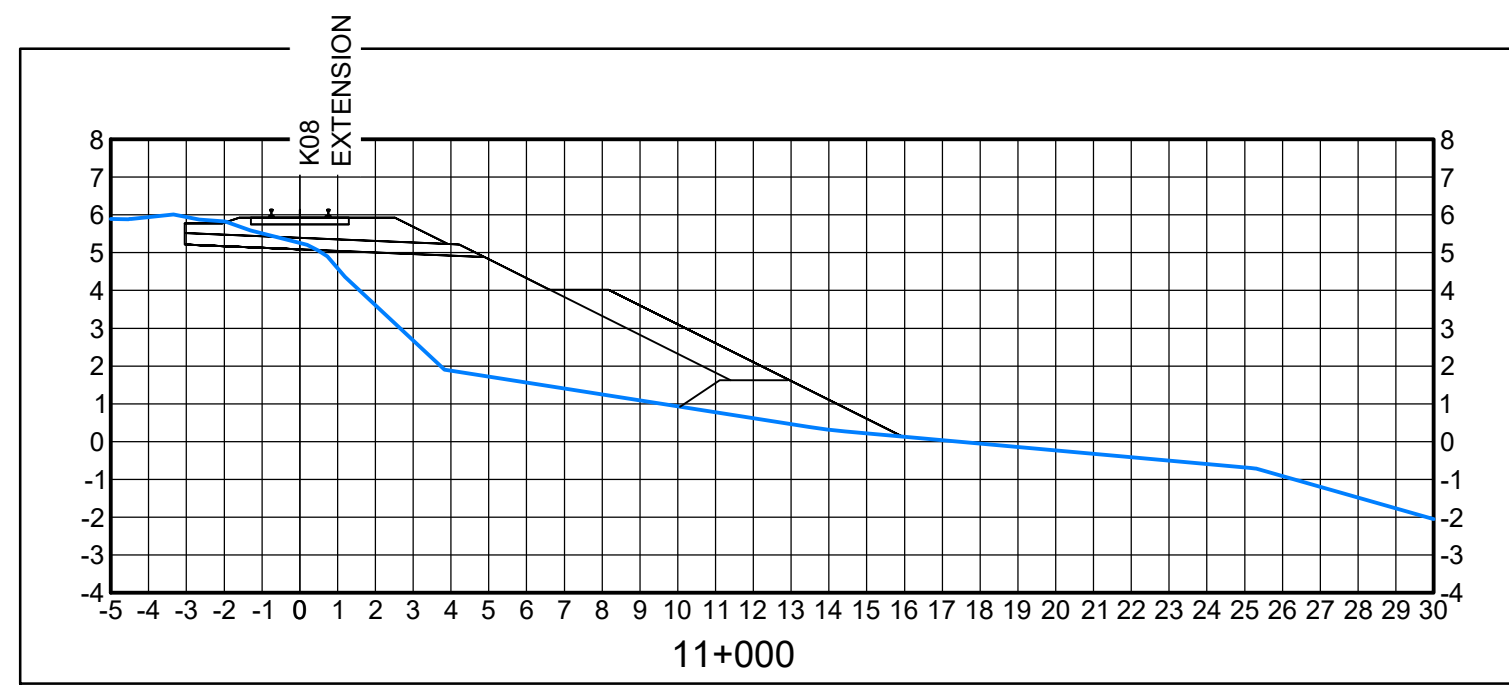
THIS DRAWING WAS PREPARED FOR THE EXCLUSIVE USE OF CANADIAN PACIFIC TOLENTY AND IS ISSUED PURSUANT TO THE HATCH OF ENGINEERING SERVICES AGREEMENT AND RECEIVED FROM THE CLIENT UNDER THE TERMS, CONDITIONS AND LIMITS OF COOPERATION SET FORTH IN THE HATCH OF ENGINEERING SERVICES AGREEMENT. HATCH DOES NOT ACCEPT AND DISCLAIMS ANY AND ALL LIABILITY OR RESPONSIBILITY ARISING FROM ANY USE OF OR RELIANCE ON THIS DRAWING BY ANY THIRD PARTY OR ANY MODIFICATION OR REVISIONS OR REFERENCED IN THIS DRAWING REMAIN THE PROPERTY OF HATCH.

No.	DATE	REVISION	BY
B	20-09-01	ISSUED FOR INFORMATION ONLY - DRAFT	T.I.
A	20-08-14	ISSUED FOR INFORMATION ONLY - DRAFT	T.I.



VANCOUVER DIVISION		MILE 122.93 TO 124.16 CASCADE SUBDIVISION	
<b>CASCADIA EAST EXTENSION - PHASE 4 PROPOSED SIDING EXTENSION OPTION 1 SECTIONS</b>			
DWG. BY:	CHK BY:	OFFICE FILE:	
MANAGER - DESIGN:		SCALE:	
		DATE:	
		PLAN No.	
M. FAVREAU DIR. PROJECTS & PUBLIC WORKS - WEST		362379-RW-100-S0-304	
			Rev. <b>B</b>





**DRAFT**  
DATE:

Sep 01, 2020, 1:23pm Login name: IMAM872934 Drawing Name: C:\pwworking\hatch\imam872934\0693839\Sections For Collier.dwg

**HATCH**

METRIC  
DIMENSIONS ARE IN METRES AND/OR MILLIMETRES  
UNLESS OTHERWISE NOTED

DESIGNED BY:	DRAWN BY:
T.I.	T.I.
DATE: 20-07-20	DATE: 20-07-20
CHECKED BY:	PROJECT MANAGER:
J.C.	T.I.
DATE: 20-07-20	DATE: 20-07-20
HATCH PROJECT No:	DWG SCALE(FULL SIZE):
362379	1:2000

PROFESSIONAL SEALS

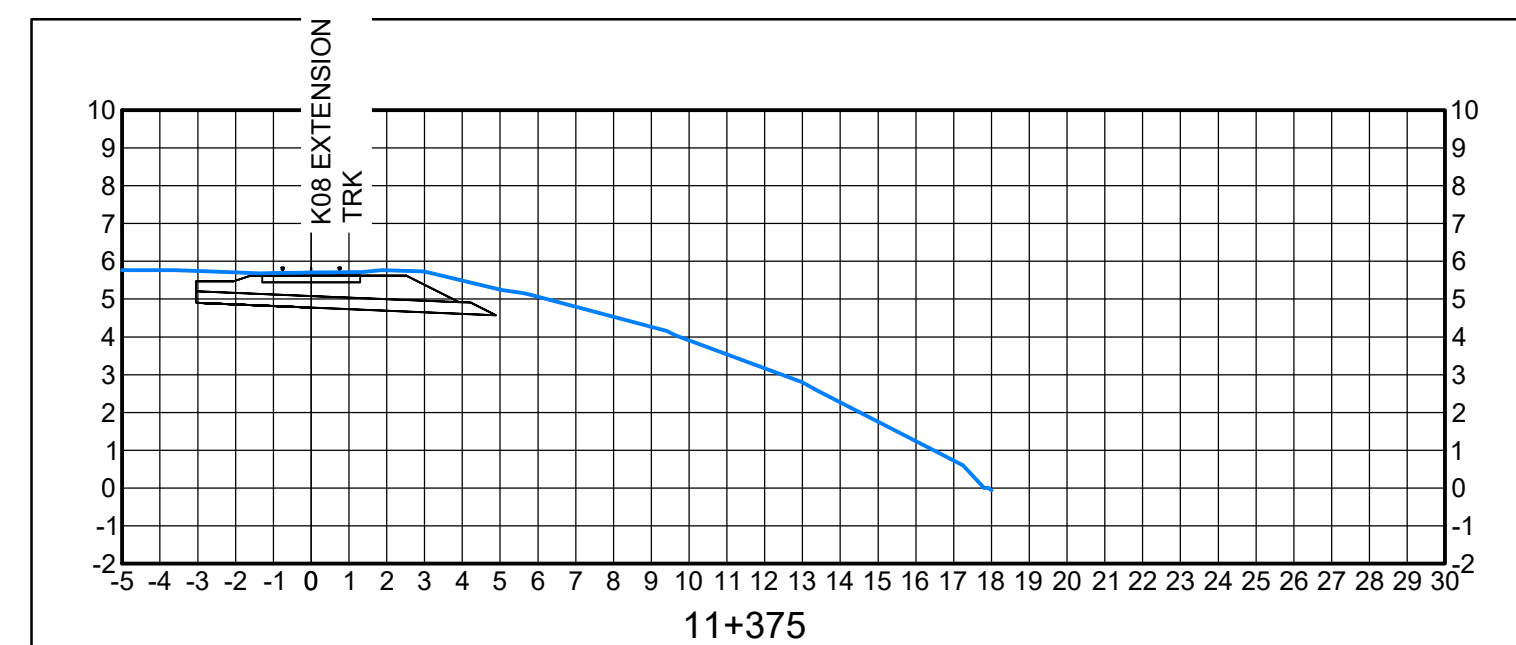
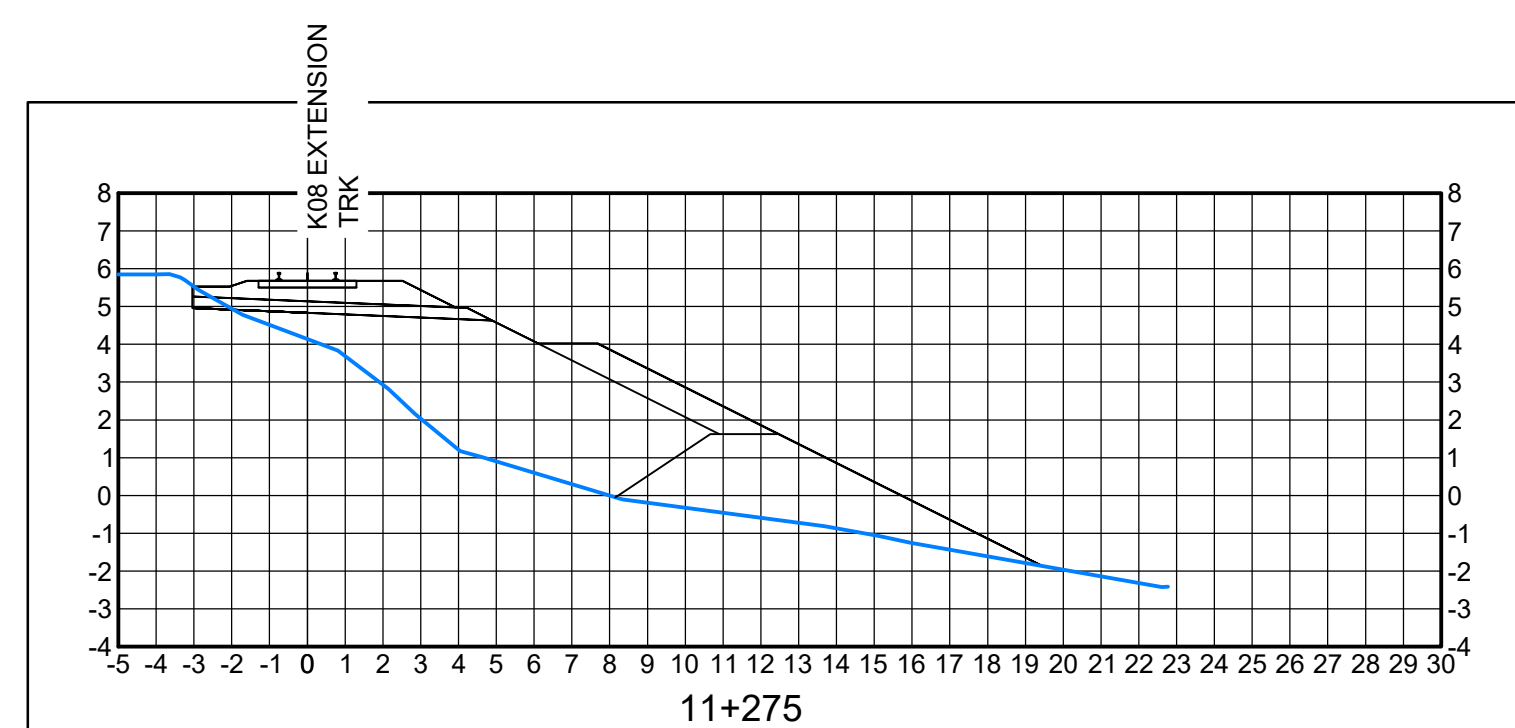
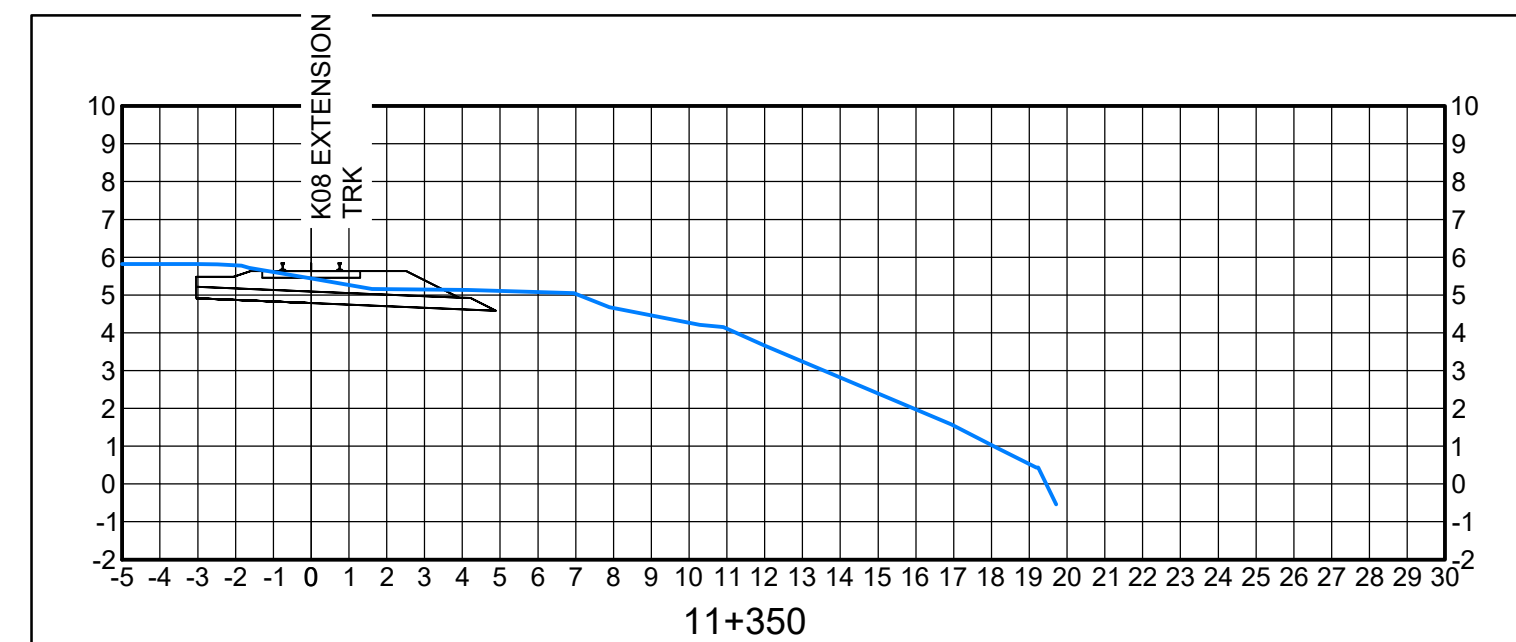
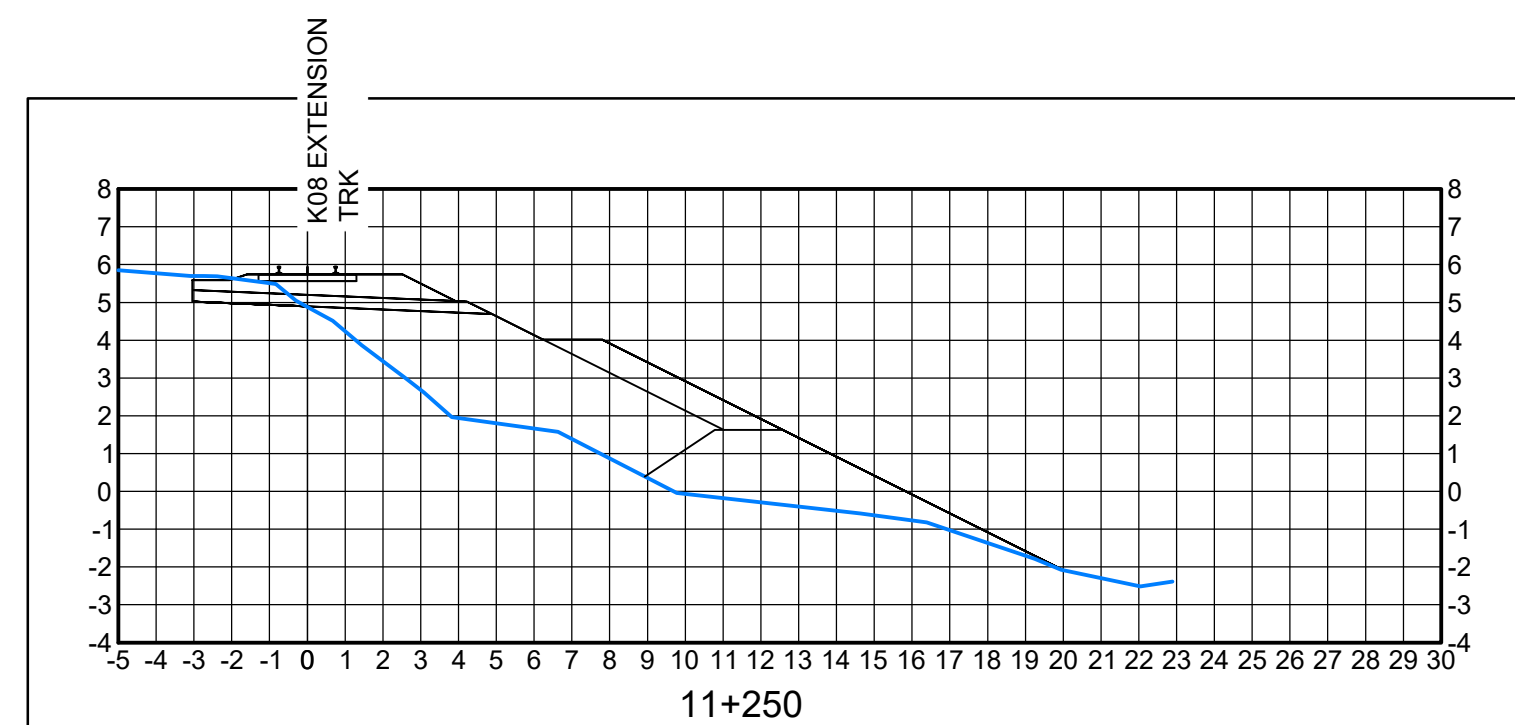
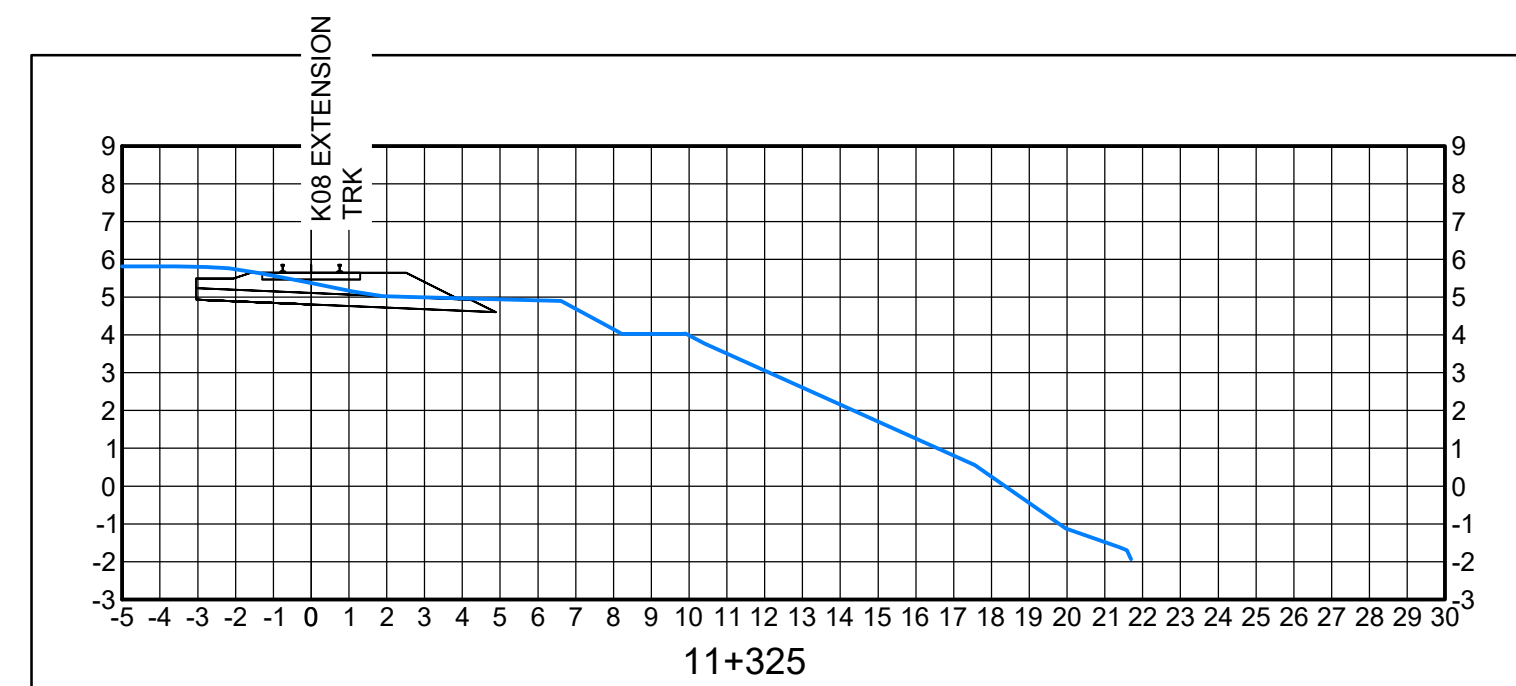
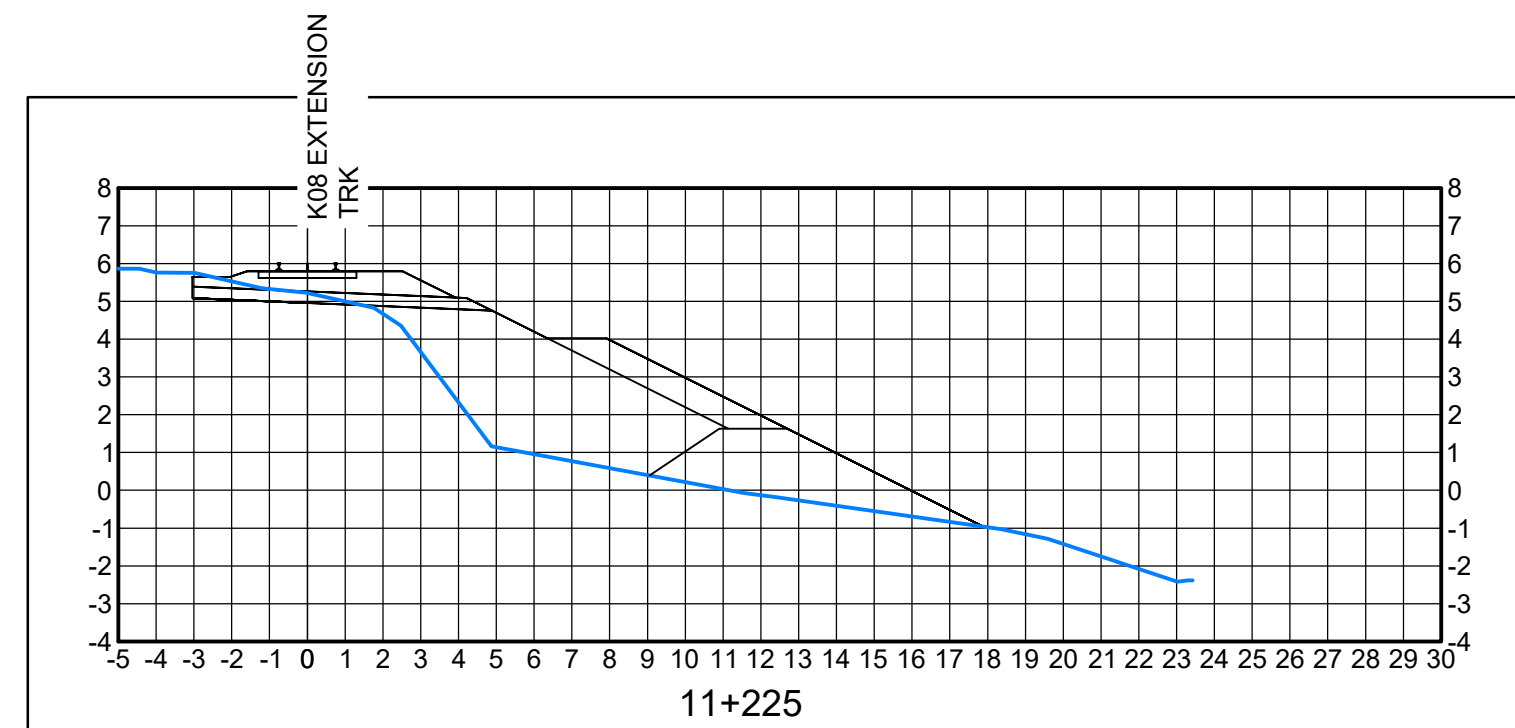
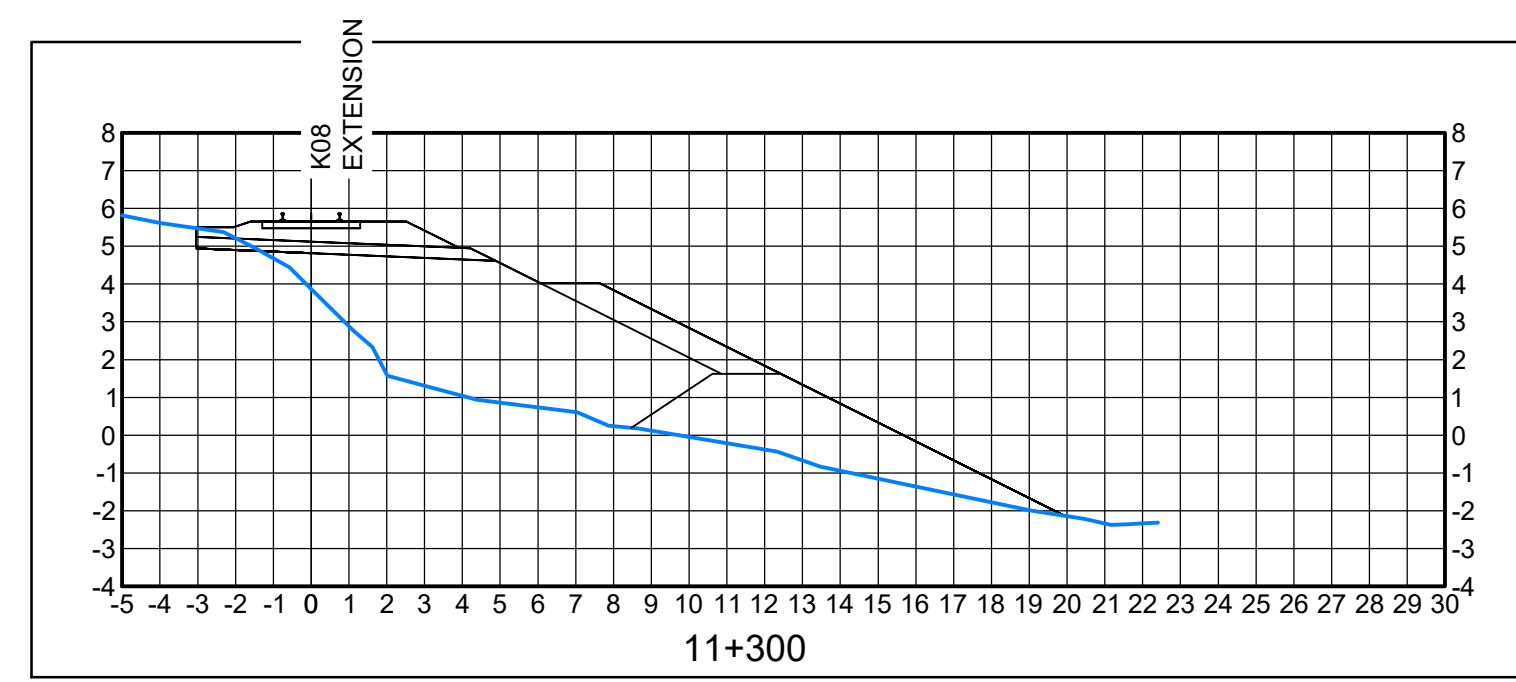
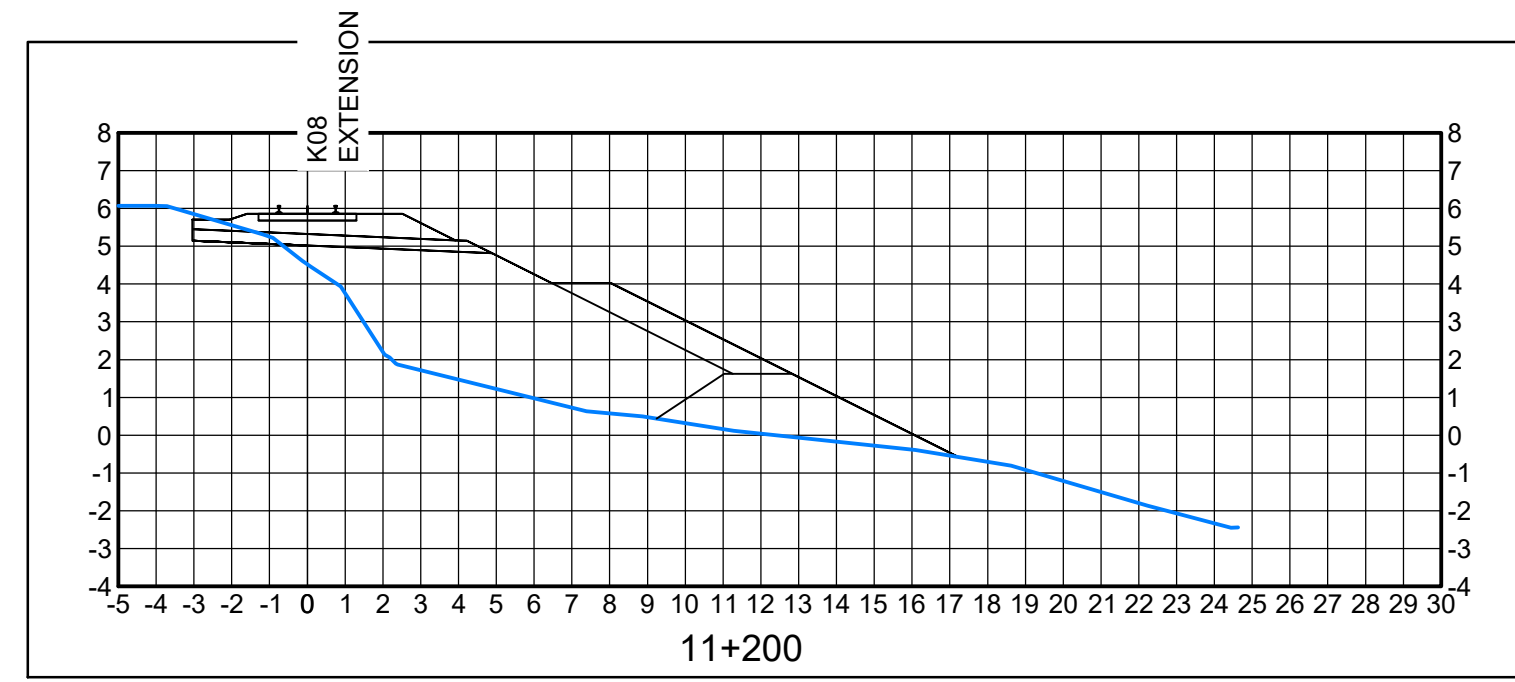
THIS DRAWING WAS PREPARED FOR THE EXCLUSIVE USE OF CANADIAN PACIFIC RAILWAY AND IS ISSUED PURSUANT TO THE WATCHDOG ENGINEERING SERVICES AGREEMENT AND RELEASES ENGINEERING SERVICES GROUP INC. AND ALL OTHERS FROM LIABILITY FOR THE PROJECT. THESE SERVICES ARE PROVIDED TO THE CLIENT ON SPECIFIC BASIS AND HATCH DOES NOT ACCEPT AND DISCLAIMS ANY AND ALL LIABILITY OR RESPONSIBILITY ARISING FROM ANY USE OF OR RELIANCE ON THIS DRAWING BY ANY THIRD PARTY OR ANY MODIFICATION OR REVISIONS OR REVISIONS IN THIS DRAWING REMAIN THE PROPERTY OF HATCH.

No.	DATE	REVISION	BY
B	20-09-01	ISSUED FOR INFORMATION ONLY - DRAFT	T.I.
A	20-08-14	ISSUED FOR INFORMATION ONLY - DRAFT	T.I.

**CP**

ENGINEERING PROJECTS - WEST

VANCOUVER DIVISION		MILE 122.93 TO 124.16 CASCADE SUBDIVISION	
<b>CASCADIA EAST EXTENSION - PHASE 4 PROPOSED SIDING EXTENSION OPTION 1 SECTIONS</b>			
DWG. BY:	CHK BY:	OFFICE FILE:	
MANAGER - DESIGN:		SCALE:	
		DATE:	
		PLAN No.	
M. FAVREAU DIR. PROJECTS & PUBLIC WORKS - WEST		362379-RW-100-S0-305	
			Rev. <b>B</b>

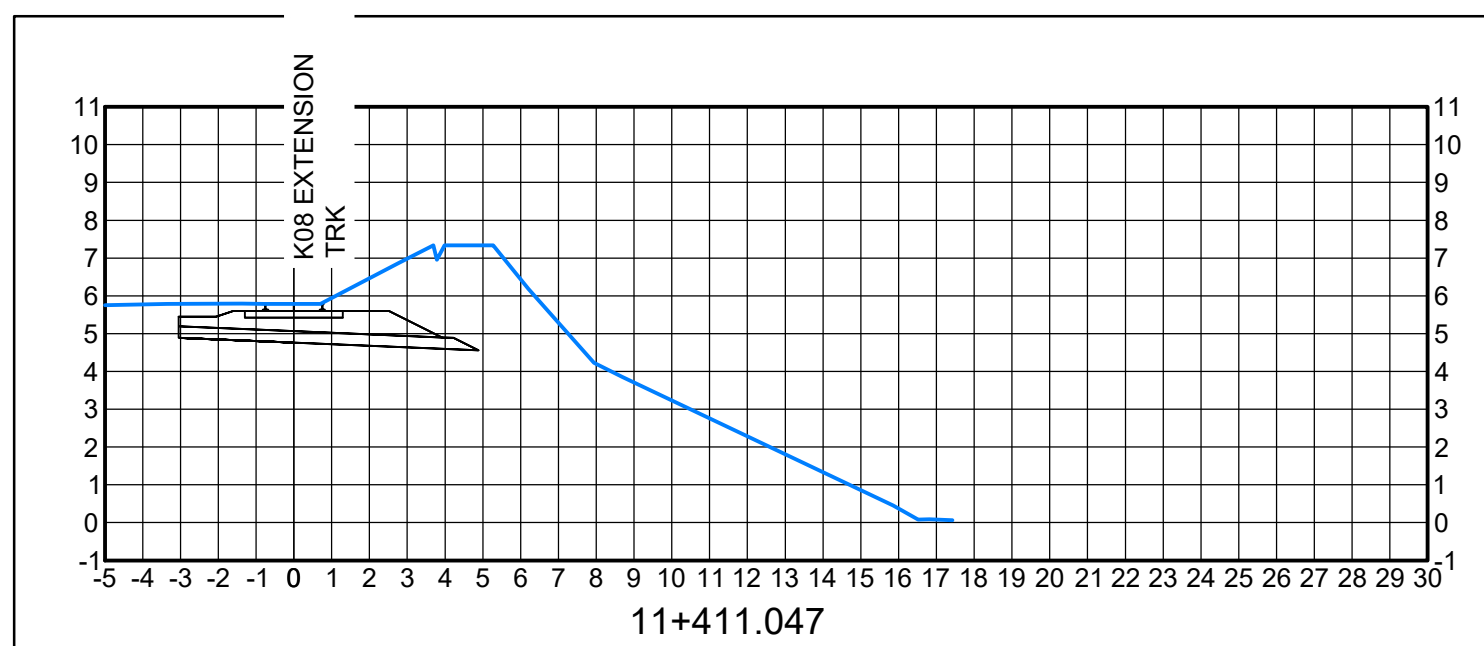
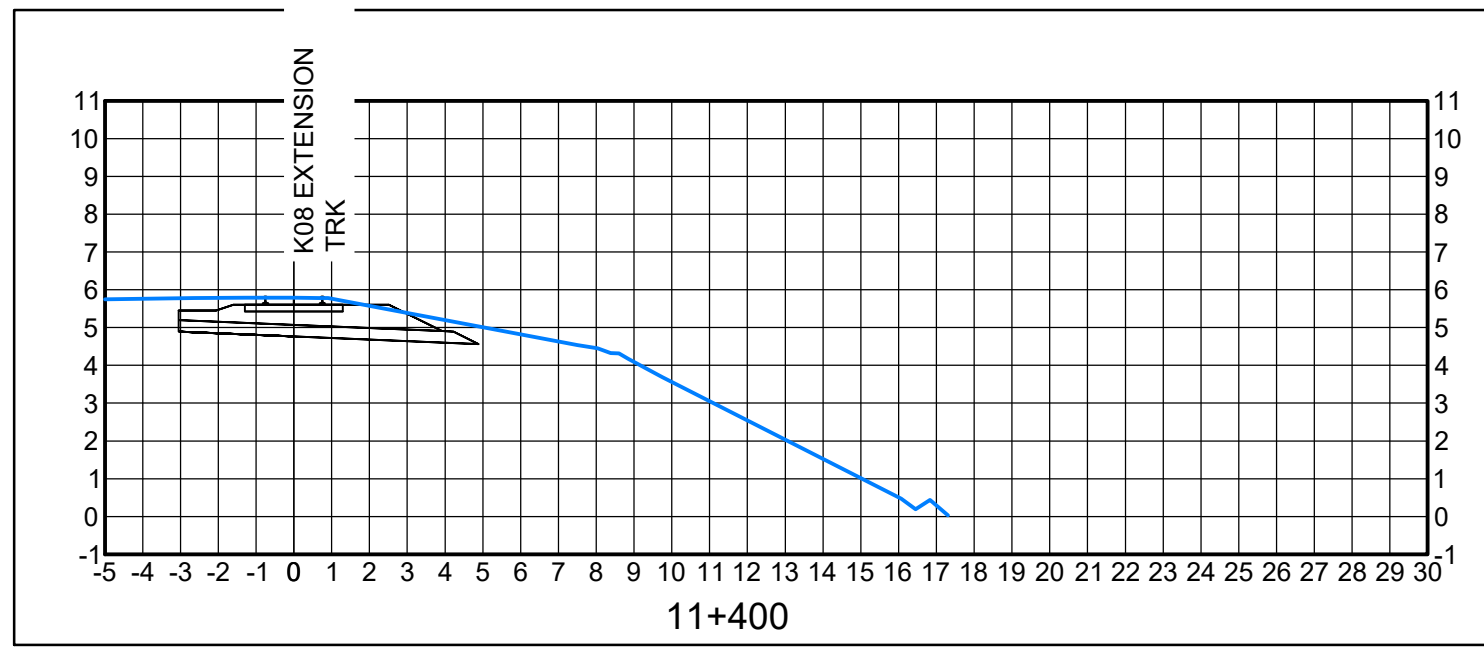


**DRAFT**  
DATE:

Sep 01, 2020, 1:24pm Login name: IMAM872934 Drawing Name: C:\pwworking\hatch\imam872934\0693839\Sections For Collier.dwg

 <b>METRIC</b> DIMENSIONS ARE IN METRES AND/OR MILLIMETRES UNLESS OTHERWISE NOTED	DESIGNED BY:	DRAWN BY:	PROFESSIONAL SEALS  THIS DRAWING WAS PREPARED FOR THE EXCLUSIVE USE OF CANADIAN PACIFIC TOLENTY AND IS ISSUED PURSUANT TO THE HATCH OF ENGINEERING SERVICES AGREEMENT AND THE USER'S RESPONSIBILITY UNDER THE TERMS, CONDITIONS AND LIMITS OF LIABILITY OF THE HATCH. THE USER'S RESPONSIBILITY IS LIMITED TO THE EXTENT OF THE HATCH'S OBLIGATION. HATCH DOES NOT ACCEPT AND DISCLAIMS ANY AND ALL LIABILITY OR RESPONSIBILITY ARISING FROM ANY USE OF OR RELIANCE ON THIS DRAWING BY ANY THIRD PARTY OR ANY MODIFICATION OR REVISION OF THIS DRAWING BY USER. AND BY THIS DRAWING IS CONFIDENTIAL AND ALL INTELLECTUAL PROPERTY RIGHTS HEREBY OR REFERENCED IN THIS DRAWING REMAIN THE PROPERTY OF HATCH.		 <b>ENGINEERING PROJECTS - WEST</b>	<b>VANCOUVER DIVISION</b> MILE 122.93 TO 124.16 CASCADE SUBDIVISION  <b>CASCADIA EAST EXTENSION - PHASE 4</b> <b>PROPOSED SIDING EXTENSION</b> <b>OPTION 1 SECTIONS</b>
	T.I. DATE: 20-07-20 CHECKED BY: J.C. DATE: 20-07-20 HATCH PROJECT No: <b>362379</b>	T.I. DATE: 20-07-20 PROJECT MANAGER: J.C. DATE: 20-07-20 DWG SCALE(FULL SIZE): <b>1:2000</b>		B 20-09-01 ISSUED FOR INFORMATION ONLY - DRAFT T.I. A 20-08-14 ISSUED FOR INFORMATION ONLY - DRAFT T.I. No. DATE REVISION BY		DWG. BY:      CHK BY:      OFFICE FILE: SCALE: MANAGER - DESIGN:      DATE: PLAN No.





**DRAFT**  
DATE:

**HATCH**

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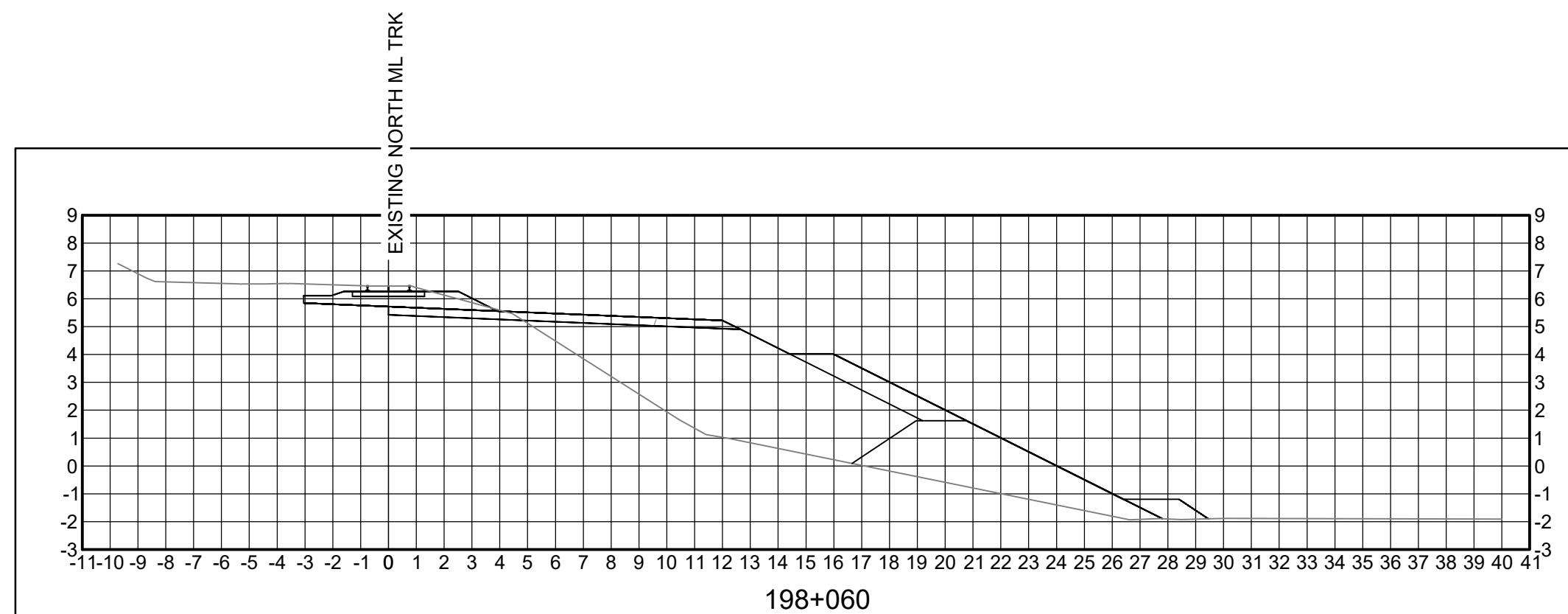
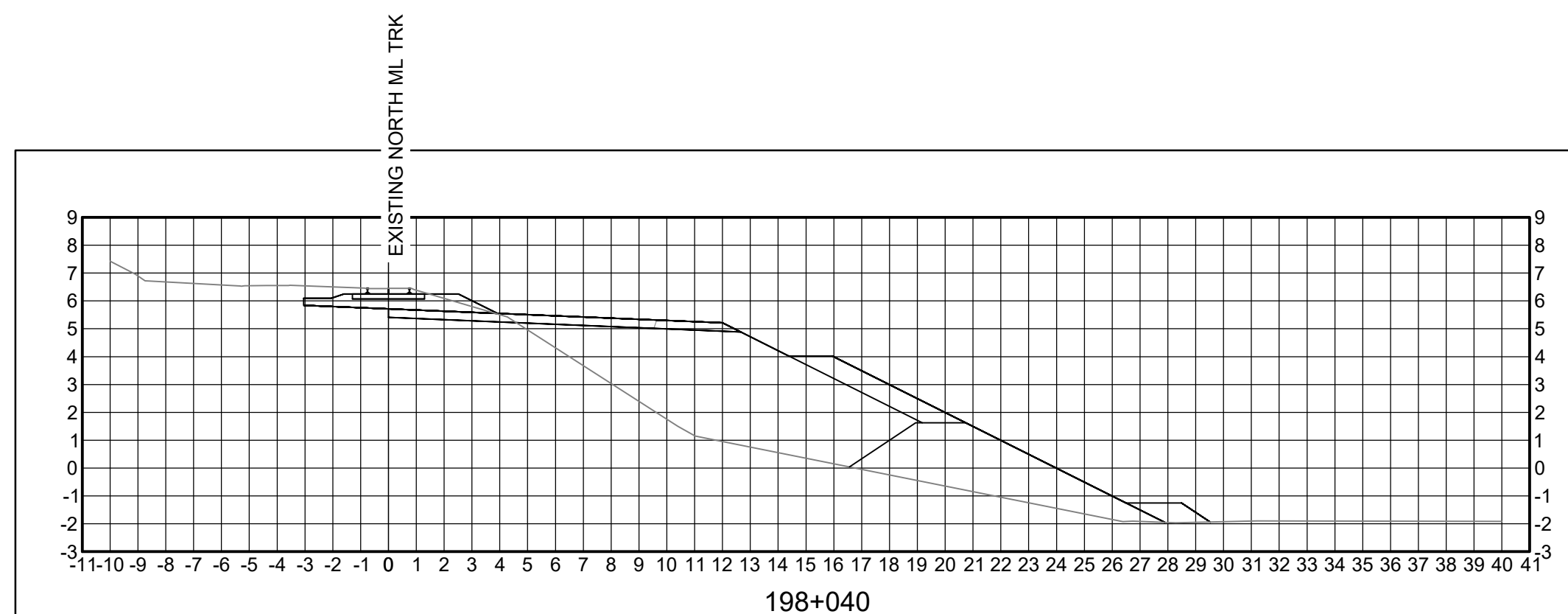
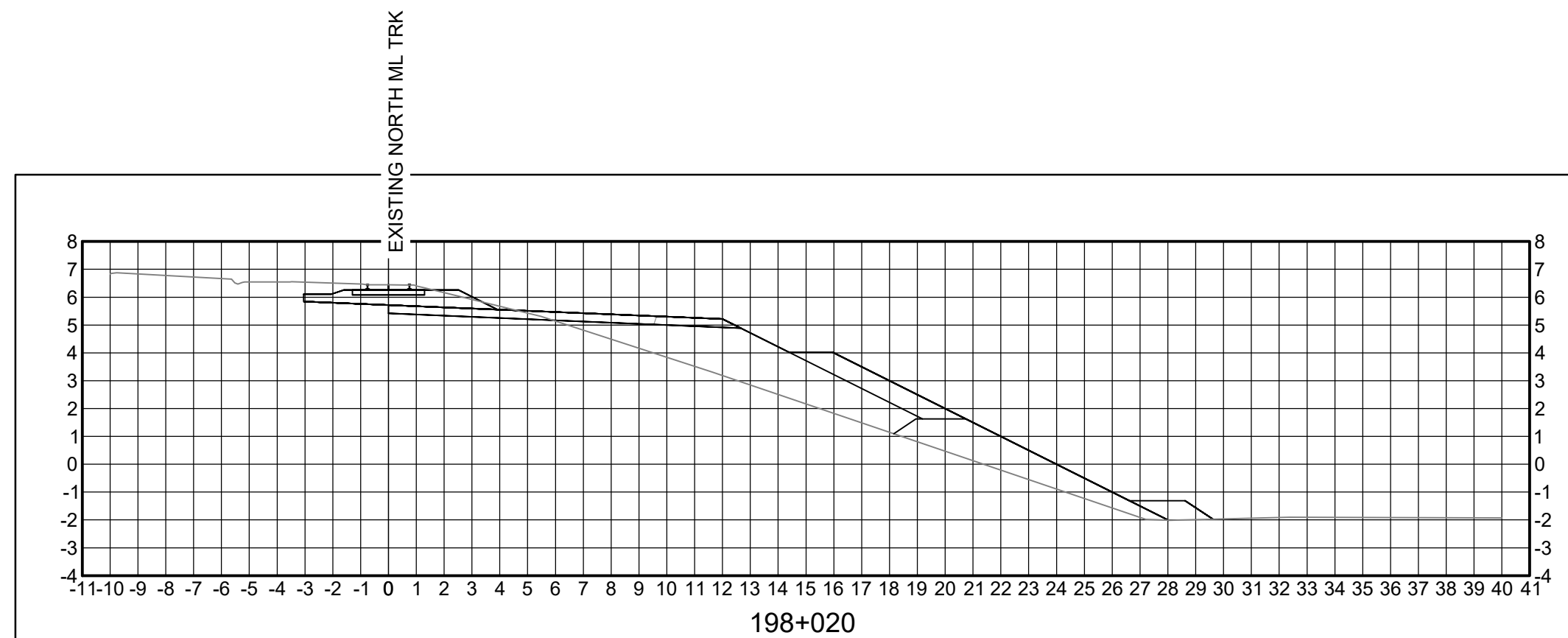
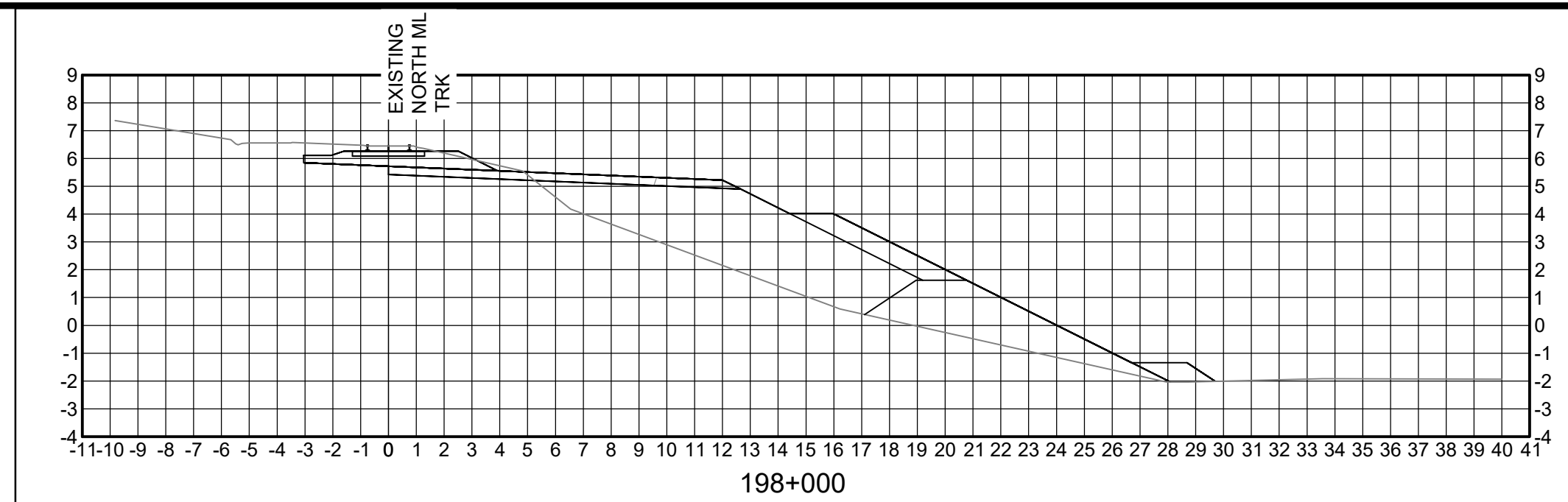


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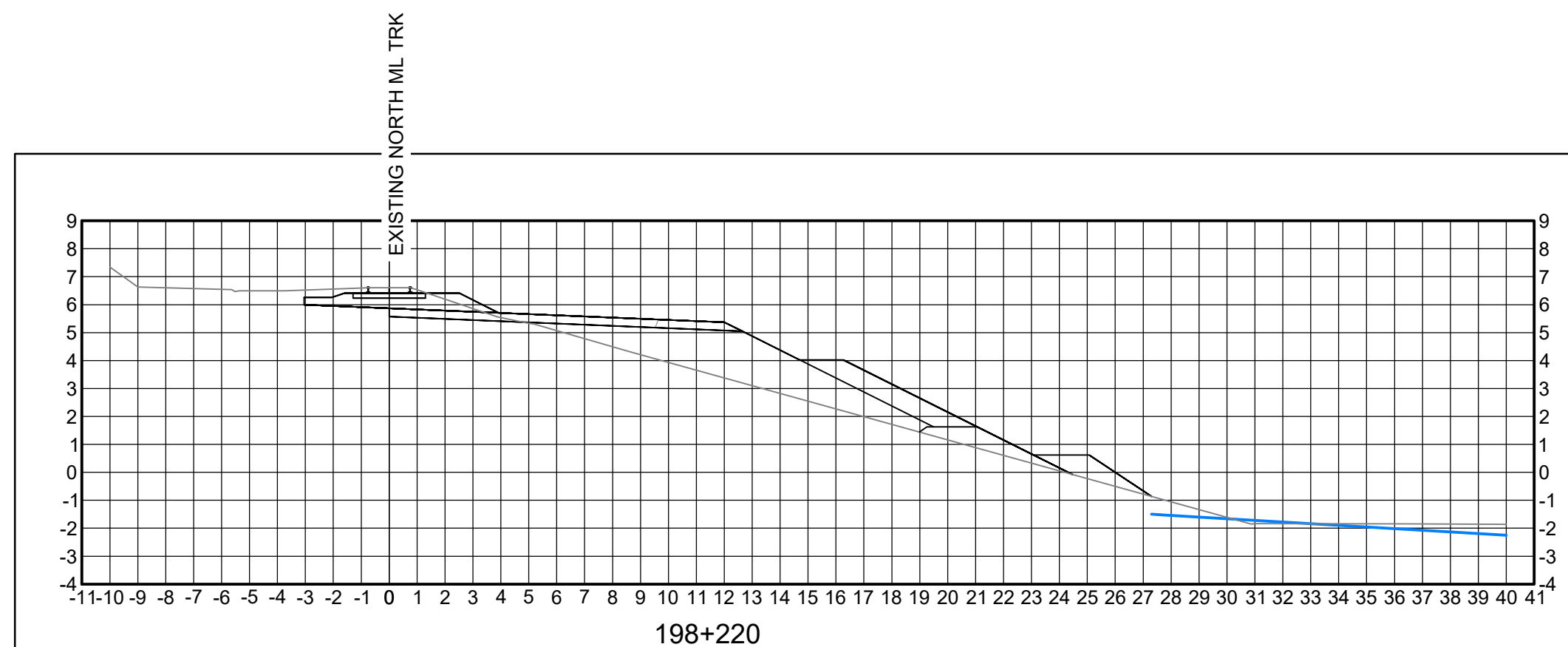
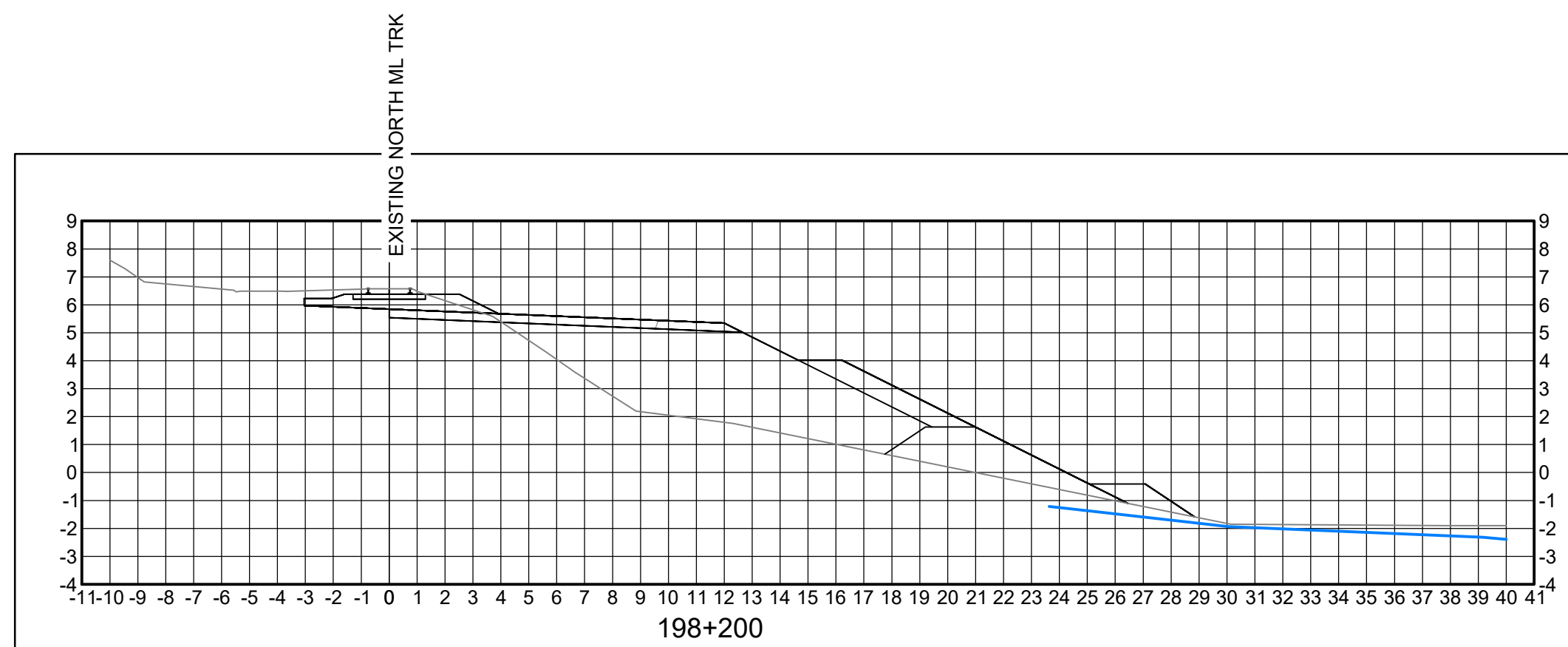
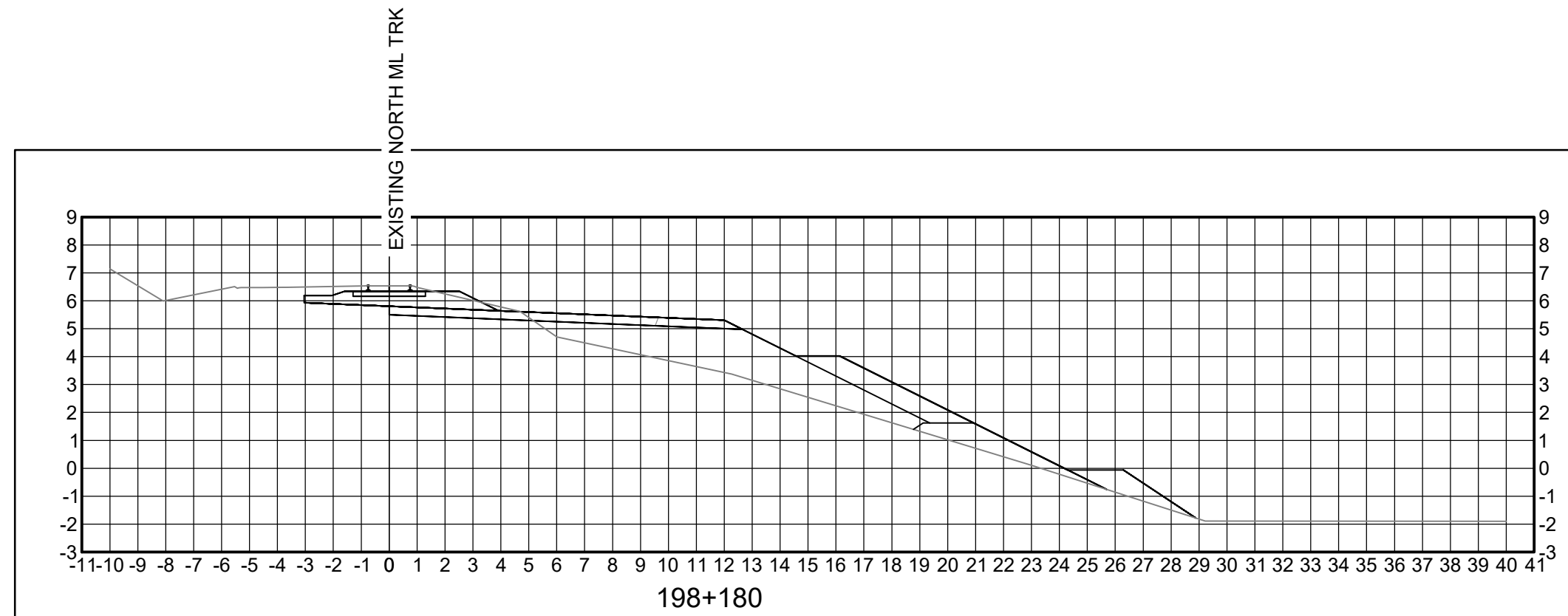
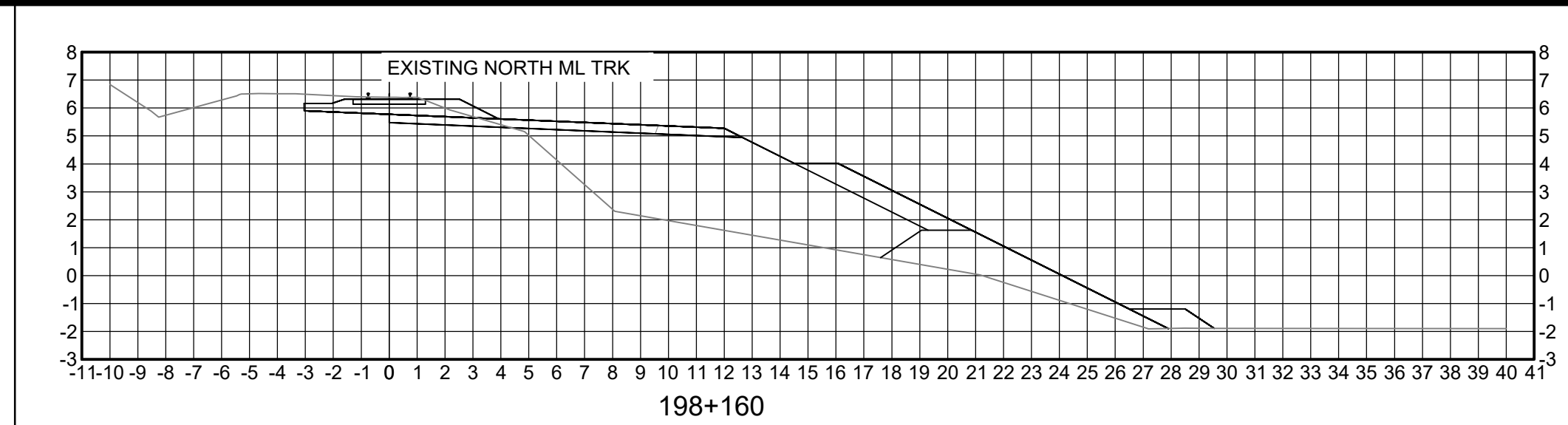
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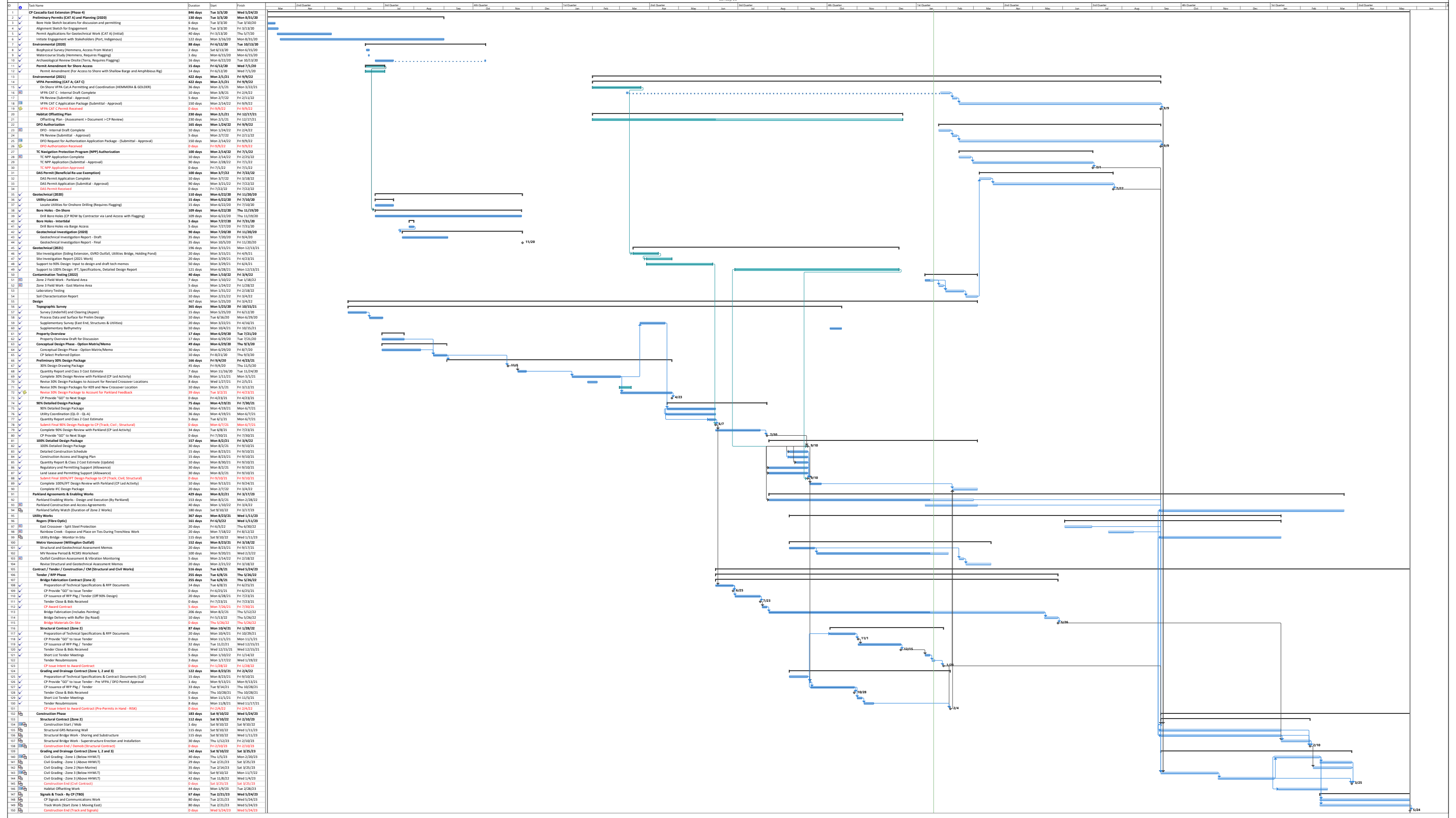
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# **APPENDIX B**

## **Typical Construction Sequencing**





# **APPENDIX C**

## **Indigenous Engagement Log**



# Viterra-Cascadia Expansion Project – Phase 4: Indigenous Engagement Summary



**Prepared for:**

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Project No. 104703-01

March 4, 2022

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### APPENDICES

Appendix A	Engagement Plan
Appendix B	Engagement Log
Appendix C	Project Introduction Letter
Appendix D	Heritage Inspection Permits



## LIST OF ACRONYMS AND ABBREVIATIONS

Acronym / Abbreviation	Definition
BC	British Columbia
CAD	Consultative Areas Database
CP	Canadian Pacific
DFO	Fisheries and Oceans Canada
FAA	<i>Fisheries Act Authorization</i>
Hemmera	Hemmera Envirochem Inc.
PER	Project and Environmental Review
Port Authority	Vancouver Fraser Port Authority
Project	Viterra-Cascadia Terminal Capacity Expansion Project (Phase 4)

## LIST OF SYMBOLS AND UNITS OF MEASURE

Symbol / Unit of Measure	Definition
km	kilometres
m	metres

## 1.0 INTRODUCTION

Canadian Pacific (CP) has retained Hemmera Envirochem Inc. (Hemmera) to support the development and implementation of the Indigenous engagement program for the Viterra-Cascadia Expansion Project – Phase 4 (the Project). This program builds on the Indigenous engagement activities completed for the Phase 3 extension to the west of the Project. The Indigenous engagement program summarized herein has been undertaken in support of CP's applications for (1) a Project and Environmental Review (PER) – Category C approval from the Vancouver Fraser Port Authority (Port Authority) and (2) a *Fisheries Act* Authorization (FAA) from Fisheries and Oceans Canada (DFO). Through the Indigenous engagement program implemented to date, CP strives to ensure that Indigenous communities comments, concerns and recommendations related to the Project are meaningfully addressed throughout this phase of project development. This report describes engagement activities with potentially impacted Indigenous communities undertaken prior to application submission up to February 7, 2022. It is understood that the Port Authority will lead formal consultation with Indigenous communities during the application review process.

### 1.1 Project Overview

As part of the Port Authority's Burrard Inlet Road and Rail Improvement Project, CP is proposing to continue expanding rail operations east of the Viterra-Cascadia Terminal and along the south shore of Burrard Inlet in Burnaby, British Columbia (BC). The expanded track length will enable increased capacity for grain product unloading. The Project will involve construction of a 1,500 m extension immediately to the east of the 300 m extension constructed for Phase 3. To expand the track, CP will widen the existing rail bed by placing clean, engineered fill material into the intertidal and subtidal marine environment. The embankment will encroach into Burrard Inlet by 18-24 m from the centre of the track. CP has developed 30% detailed design and is currently developing finalized design drawings and determining construction methods. **Figure 1** illustrates 30% detailed design.



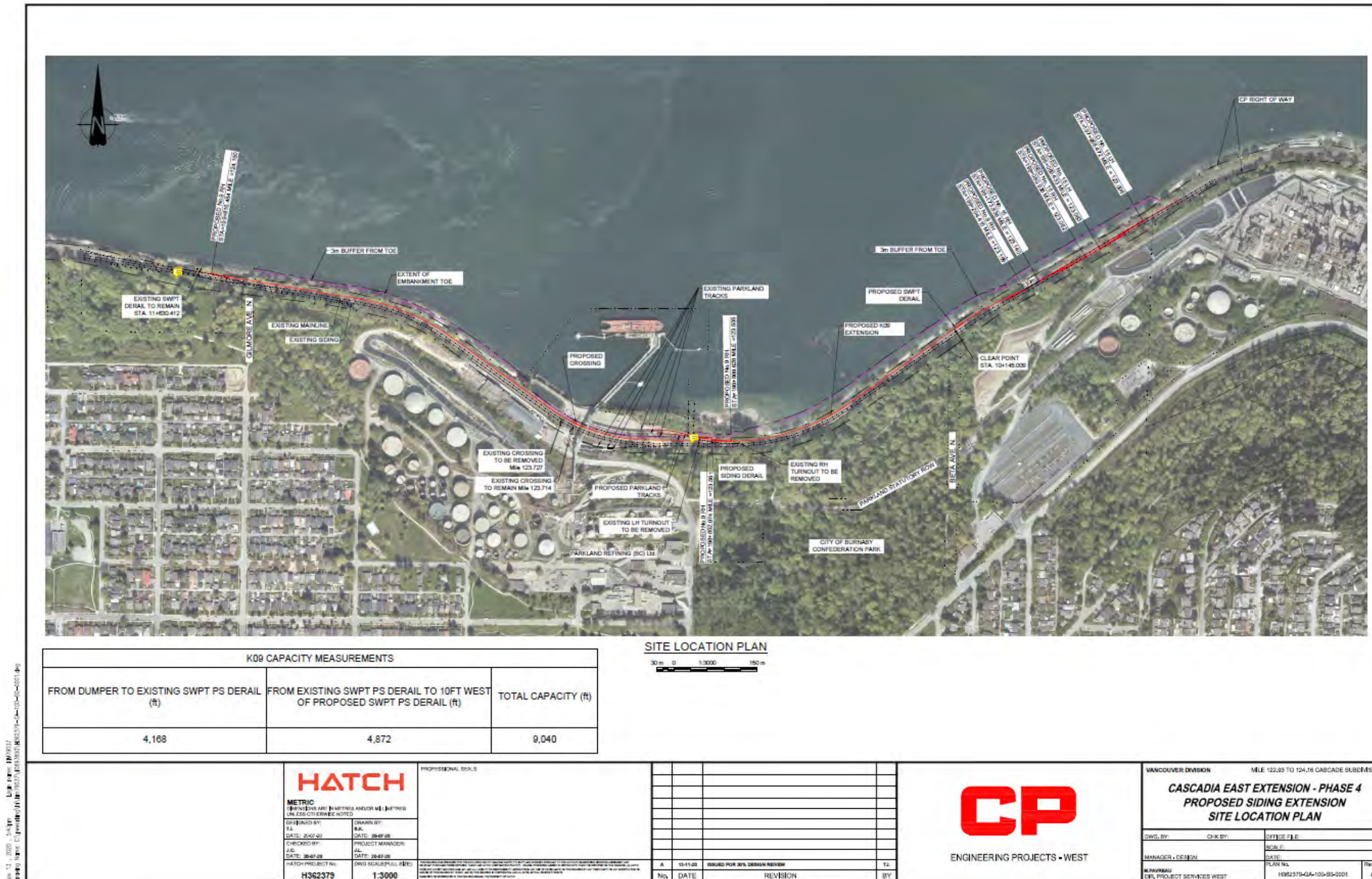


Figure 1 Proposed Project Location (30% detailed design)

## 1.2 Regulatory Context

### Port Authority Project and Environmental Review – Category C

Pursuant to Port Authority guidance, Indigenous consultation is a typical requirement for the Port Authority's PER – Category C process. Although the Port Authority leads formal Indigenous consultation activities once the PER application has been accepted for review, proponents are encouraged to engage with Indigenous communities prior to submitting a completed application (i.e., during application development). This helps to build relationships with Indigenous communities and initiates effective communication.<sup>1</sup>

### *Fisheries Act Authorization*

DFO is responsible for discharging the Crown's Duty to Consult with Indigenous communities with respect to the FAA,<sup>2</sup> and proponents are encouraged to engage with Indigenous communities during development of offsetting options and prior to application submission.

## 2.0 ENGAGEMENT APPROACH

### 2.1 Engagement Purpose and Objectives

Hemmera, on behalf of CP, has led the Indigenous engagement process for the Project to support CP's PER and FAA applications. Formal consultation will be led by the Port Authority and DFO once the application has been submitted. In this context, the engagement that has taken place to date has included a broad range of initiatives and activities such as relationship building, information sharing, discussion of project-related issues and concerns, and discussion of Project logistics. The objectives of the Indigenous engagement program have been to:

- Identify Indigenous communities with Aboriginal Interests (i.e., Aboriginal rights, including title) overlapping the Project area.
- Develop collaborative working relationships with potentially impacted Indigenous communities by sharing Project information and providing opportunities for Indigenous communities to share comments, concerns, and recommendations regarding Project activities (e.g., offsetting).
- Help ensure that potential adverse impacts to Aboriginal Interests related to the Project are appropriately identified, mitigated, and/or otherwise addressed.

---

<sup>1</sup> Vancouver Fraser Port Authority. 2015. Project and Environmental Review: Aboriginal Consultation – Information for Applicants. <https://www.portvancouver.com/wp-content/uploads/2017/04/VFPA-PER-Aboriginal-Consultation-Information-for-Applicants-FINAL-2015-07-09.pdf>. Accessed 27 August 2020.

<sup>2</sup> Fisheries and Oceans Canada. 2019. Request a review of your project near water: Step 2. Understand the project review process. <https://www.dfo-mpo.gc.ca/pnw-ppe/reviews-revues/request-review-demande-d-examen-002-eng.html>. Accessed 27 August 2020.



## 2.2 Indigenous Communities Identified for Engagement

Potentially impacted Indigenous communities were identified through a search of the BC Consultative Areas Database (CAD). Although not identified through the CAD search, Kwikwetlem First Nation was also engaged due to their existing relationship with CP, as well as their prior interest and involvement in Phase 3. In total, 16 Indigenous communities were identified. Member communities of the Stó:lō Nation were engaged collectively through the People of the River Referrals Office. The following Indigenous communities were engaged throughout the Project planning and application process (appearing in alphabetical order):

1. Cowichan Tribes
2. Halalt First Nation
3. Kwikwetlem First Nation
4. Lyackson First Nation
5. Musqueam Indian Band
6. Penelakut Tribe
7. Seabird Island Band
8. Squamish Nation
9. Stó:lō Nation including:
  - Shxw'ōwhámél First Nation
  - Skawahlook First Nation
  - Soowahlie First Nation
  - Stó:lō Tribal Council
10. Stz'uminus First Nation
11. Tseil-Waututh Nation
12. Ts'uubaa-asatx Nation (formerly known as Lake Cowichan First Nation).

The level of engagement with each Indigenous community was based on each community's expressed level of interest in the Project, proximity to the Project, and anticipated potential impacts based on proximity to the Project. CP recognizes that this level of interest and associated participation may change throughout future stages of the Project.

## 2.3 COVID-19 Considerations

The COVID-19 pandemic has affected the operations and capacity of many Indigenous communities, and engagement methods have been designed and implemented to meet their current needs, priorities and operational capabilities. Where appropriate, monitors were engaged virtually (i.e., they were sent text, emails and/or daily field reports). Many Indigenous communities are not conducting in-person meetings, so meetings were held virtually via video conference call. Additionally, in recognition of current capacity constraints, an agreed-upon timeline for review of Project materials was implemented with each participating Indigenous community.

## 3.0 ENGAGEMENT ACTIVITIES

Indigenous engagement was initiated in April 2020 for CP to share project-related information with participating Indigenous communities and to provide opportunities for the communities to share comments, concerns, and recommendations with CP well in advance of application submission. The Engagement Plan (**Appendix A**) guided the engagement program, although actual activities reflect Project developments as well as requests and priorities identified by Indigenous communities from April 9, 2020 to February 7, 2022.

The detailed Engagement Log showing all communications with Indigenous communities is provided in **Appendix B**. Key engagement activities from April 9, 2020 to February 7, 2022 are described in the following sections.

### 3.1 Initiating Engagement

#### Project Introduction Letter

The Indigenous communities identified in **Section 2.2** were emailed the Project's introduction letter (**Appendix C**) and KMZ file of the Project location on April 9, 2020 (**Table 1**). Indigenous communities provided responses shortly after this initial communication.

- The Stó:lō Nation, via the People of the River Referrals Office, formally deferred Project involvement to Musqueam Indian Band, Squamish Nation, and Tsleil-Waututh Nation.
- Halalt First Nation confirmed via email that they had received the Project's introduction letter.
- Kwikwetlem First Nation met with CP to discuss several CP projects, including the Viterra-Cascadia Expansion Project.

In mid-April, all other identified Indigenous communities were contacted by phone to confirm receipt of the Project's introduction letter. If there was no answer despite repeated phone calls a voicemail message was left, where possible. Most Indigenous communities were reached by phone and, in some cases, the introduction letter was forwarded to additional contacts as a result. In July, all Indigenous communities that had not deferred their review or met with CP were contacted again by phone and/or email to help ensure that they were aware of the Project received introductory information.

#### Archaeological Notification

On behalf of CP, the archaeological subconsultant, Terra Archaeology, sent a notification letter to all potentially impacted Indigenous communities regarding the proposed archaeological fieldwork program. The letter indicated that no documented archaeological sites overlapped the Project area, but that nine archaeological sites were located within 2 km of the Project area. Indigenous communities were invited to provide comments and concerns related to the proposed program. No comments or concerns were shared with CP.



**Table 1 Initiating Engagement**

#	Type	Description	Indigenous Communities	Date
1	Email/ Stó:lō Connect	Hemmera emailed the Project's introduction letter and KMZ file of the Project location to all potentially impacted Indigenous communities. As CP is working on several projects that affect the same Indigenous communities, a single letter for several projects was issued, where applicable.	All potentially impacted Indigenous communities: <ul style="list-style-type: none"> <li>• Cowichan Tribes</li> <li>• Halalt First Nation</li> <li>• Kwikwetlem First Nation</li> <li>• Lyackson First Nation</li> <li>• Musqueam Indian Band</li> <li>• Penelakut Tribe</li> <li>• Stó:lō Nation (via Stolo Connect, c/o People of the River Referrals Office)</li> <li>• Seabird Island Band</li> <li>• Squamish Nation</li> <li>• Stz'uminus First Nation</li> <li>• Tsleil-Waututh Nation</li> <li>• Ts'uubaa-asatx Nation</li> </ul>	April 9, 2020
2	Email	Terra Archaeology, a subcontractor of Hemmera, sent a notification letter to Indigenous communities with respect to the archaeological field program. Terra Archaeology also applied for Heritage Inspection Permits from relevant Indigenous communities.	All potentially impacted Indigenous communities.	April 13, 2020
3	Phone	Hemmera phoned Indigenous communities that did not directly respond to the initial email to confirm receipt of Project materials.	All potentially impacted Indigenous communities (except Halalt First Nation, Kwikwetlem First Nation, and Stó:lō Nation who had already responded).	Mid-April 2020
4	Phone/Email	Hemmera phoned and/or emailed Indigenous communities that had not deferred their involvement in the Project to see if they had any comments or concerns.	All potentially impacted Indigenous communities (except Kwikwetlem First Nation and Stó:lō Nation who had already responded).	July 2020

### 3.2 Engaging with Interested Indigenous Communities

Following initial engagement, CP continued communications with Indigenous communities that expressed an interest in being involved in the Project (**Table 2**). Four communities requested involvement in the archaeological program: Kwikwetlem First Nation, Musqueam Indian Band, Squamish Nation, and Tsleil-Waututh Nation. Additionally, Kwikwetlem First Nation, Musqueam Indian Band, and Tsleil-Waututh Nation requested additional Project information (e.g., biophysical workplans) and/or involvement in planning the habitat offsetting program required as part of the FAA.

## Archaeological Program

Terra Archaeology coordinated involvement of interested Indigenous communities in the archaeological program, which consisted of an initial pedestrian survey of the Project area, supplemental fieldwork related to an artifact (lithic debitage) found during the initial survey, and off-site examination of geotechnical samples. During the initial pedestrian survey on June 22, 2020 a Squamish Nation field monitor was on-site with Terra Archaeology. Kwikwetlem First Nation, Musqueam Indian Band, and Tsleil-Waututh Nation were provided with field reports at the end of the field day.

With respect to the supplemental fieldwork, Terra Archaeology sent text and photo updates to Musqueam Indian Band and Tsleil-Waututh Nation virtual monitors throughout the day. Squamish Nation and Kwikwetlem First Nation were provided with field reports at the end of the field day. Results of the examination of geotechnical samples were also shared with these communities.

Terra Archaeology applied for Heritage Inspection Permits from Musqueam Indian Band, Squamish Nation, Stó:lō Nation, and Tsleil-Waututh Nation. Permits were issued from Musqueam Indian Band (MIB-2020-060-AIA), Squamish Nation (20-0125), Stó:lō Nation (2020-081), and Tsleil-Waututh Nation (2020-074). See **Appendix D** for copies of these permits. The Archaeological Impact Assessment (AIA) was delivered to these Indigenous communities as required by the respective Heritage Inspection Permits.

## Offsetting Planning

CP and Hemmera held offsetting workshops in August 2020 with Kwikwetlem First Nation and Tsleil-Waututh Nation via Microsoft Teams. CP and Hemmera gave a PowerPoint presentation that described the Project, anticipated permits, anticipated impacts to fisheries, and potential offsetting locations and approaches. CP met again with Kwikwetlem First Nation and Tsleil-Waututh Nation in October 2020 and November 2020, respectively, to discuss the proposed offsetting concept designed for Burrard Inlet. The draft Offsetting Plan was shared with Kwikwetlem First Nation, Musqueam Indian Band, and Tsleil-Waututh Nation in March 2021 for review and feedback. The offsetting design was created using feedback gathered during the preliminary workshops as well as engagement from the previous Viterra-Cascadia Expansion Phase 3 Project. CP submitted their Offsetting Plan as part of the June 4, 2021 PER and FAA Applications.

CP met with Musqueam Indian Band on June 11, 2021, to discuss the Offsetting Plan submitted as part of the June 4, 2021 PER and FAA Applications. CP also offered to organize a workshop with Squamish Nation, however no response has been received to date.

In August 2021, the Port informed CP that the proposed offsetting location could no longer be used because of proximity to a small vessel holding area, for use while large ships transit Second Narrows. The Port shared several potential new offsetting locations for CP's consideration. Of these, two were selected for further study: 1) Berry Point and 2) Barnet Marine Park. Divers were sent to both locations in August to assess subtidal habitat and suitability as an offsetting location. CP shared their suggested offsetting polygons within these two locations with Kwikwetlem First Nation, Musqueam Indian Band, Squamish Nation, and Tsleil-Waututh Nation. These offsetting polygons were considered draft and had been selected because the substrate and bathymetry supports the habitat offsetting design that CP proposed to install in their June 4, 2021 PER and FAA Applications. CP informed these Indigenous communities that the proposed habitat offsetting design was almost the same offsetting design previously shared for review and comment through meetings and the document review process in 2021.



A redline version of the Offsetting Plan will be provided to Kwikwetlem First Nation, Musqueam Indian Band, Squamish Nation, and Tsleil-Waututh Nation for review and comment. CP looks forward to understanding Indigenous communities’ feedback during the Port and DFO’s consultation periods.

Questions, comments, feedback, issues, interests, and priorities for offsetting shared by Indigenous communities up to February 7, 2022 are detailed in **Section 4.0**.

### Project Document Review

As of February 7, 2022 CP has provided Kwikwetlem First Nation and Tsleil-Waututh Nation with multiple project documents for review and comment including the AIA, the Aquatics Effects Assessment (AEA), the Geotechnical Report, the Noise Screening, the Hydraulics Report, the Engagement Summary, the Marine Communications Plan, the Navigational Impact Assessment, the Construction Environmental Monitoring Plan (CEMP), the Offsetting Plan (June 4, 2021 version), the Species at Risk Assessment, the Land Requirements figure, and the Marine Construction Plan. The draft Offsetting Plan (June 4, 2021 version) was also sent to Musqueam Indian Band. CP received feedback from Indigenous communities on multiple draft Project documents including the AEA, Marine Communications Plan, Navigational Impact Assessment, CEMP, Offsetting Plan, Species at Risk and Vegetation Assessment, and Marine Construction Plan. This feedback has been captured in **Section 4.0** and incorporated into CP’s June 4, 2021 and March 2022 PER and FAA Applications as applicable. Not all documents that were reviewed received feedback.

**Table 2 Engaging with Participating Indigenous Communities**

#	Type	Description	Indigenous Communities	Date
1	Email	Hemmera provided the workplan for biophysical field studies to interested Indigenous communities.	<ul style="list-style-type: none"> <li>Kwikwetlem First Nation</li> <li>Tsleil-Waututh Nation</li> </ul>	May 7, 2020
2	Archaeological Field Survey	Terra Archaeology conducted a field survey of the Project area and invited interested Indigenous communities to monitor on-site or virtually. Alternatively, Indigenous communities were sent a report of the day’s activities.	On-site monitor: <ul style="list-style-type: none"> <li>Squamish Nation</li> </ul> Provided with the day’s report: <ul style="list-style-type: none"> <li>Kwikwetlem First Nation</li> <li>Musqueam Indian Band</li> <li>Tsleil-Waututh Nation</li> </ul>	June 22, 2020
3	Virtual Offsetting Workshop	CP and Hemmera conducted virtual offsetting workshops with the Kwikwetlem First Nation and Tsleil-Waututh Nation, as requested. This involved a presentation and discussion regarding Project activities, anticipated permits, anticipated impacts to fisheries, and potential offsetting locations and approaches.	<ul style="list-style-type: none"> <li>Kwikwetlem First Nation</li> <li>Tsleil-Waututh Nation</li> </ul>	August 11, 2020
5	Supplemental Archaeological Fieldwork	Terra Archaeology conducted supplemental fieldwork and invited Indigenous communities to participate on-site or virtually. Alternatively, Indigenous communities were sent a summary of the day’s activities.	Virtual monitors: <ul style="list-style-type: none"> <li>Musqueam Indian Band</li> <li>Tsleil-Waututh Nation</li> </ul> Provided with summary: <ul style="list-style-type: none"> <li>Kwikwetlem First Nation</li> </ul>	August 21, 2020

#	Type	Description	Indigenous Communities	Date
			<ul style="list-style-type: none"> <li>• Squamish Nation</li> </ul>	
7	Document Sharing: Draft Archaeological Impact Assessment (AIA) Report	Per Heritage Inspection Permit requirements and involvement in the archaeological monitoring, CP provided the draft AIA Report for review and comment.	<ul style="list-style-type: none"> <li>• Kwikwetlem First Nation</li> <li>• Musqueam Indian Band</li> <li>• Squamish Nation</li> <li>• Stó:lō Nation</li> <li>• Tseil-Waututh Nation</li> </ul>	October 14, 2020
8	Virtual Offsetting Workshop	CP and Hemmera conducted a virtual offsetting workshop with Tseil-Waututh Nation. This workshop involved a presentation and discussion regarding the offsetting concept designed for Burrard Inlet based on Tseil-Waututh Nation's initial feedback.	<ul style="list-style-type: none"> <li>• Tseil-Waututh Nation</li> </ul>	October 28, 2020
9	Virtual Offsetting Workshop	CP and Hemmera conducted a virtual offsetting workshop with Kwikwetlem First Nation. This workshop involved a presentation and discussion regarding the offsetting concept designed for Burrard Inlet based on Kwikwetlem First Nation's feedback.	<ul style="list-style-type: none"> <li>• Kwikwetlem First Nation</li> </ul>	November 2, 2020
11	Document Sharing: Draft Aquatics Effects Assessment (AEA) Report	CP provided the draft AEA Report for review and comment.	<ul style="list-style-type: none"> <li>• Kwikwetlem First Nation (comments received)</li> <li>• Tseil-Waututh Nation (comments received)</li> </ul>	November 17, 2020
13	Document Sharing: Draft Geotechnical Report &	CP provided the draft Geotechnical Report for review and comment	<ul style="list-style-type: none"> <li>• Kwikwetlem First Nation</li> <li>• Tseil-Waututh Nation</li> </ul>	November 23, 2020
14	Document Sharing: Noise Screening	CP provided the Noise Screening for review and comment	<ul style="list-style-type: none"> <li>• Kwikwetlem First Nation</li> <li>• Tseil-Waututh Nation</li> </ul>	December 3, 2020
15	Document Sharing: Draft Hydraulics Report	CP provided the draft Hydraulics Report for review and comment	<ul style="list-style-type: none"> <li>• Kwikwetlem First Nation</li> <li>• Tseil-Waututh Nation</li> </ul>	December 18, 2020
16	Document Sharing: Draft Summary of Engagement	CP provided the draft Summary of Engagement for review and comment	<ul style="list-style-type: none"> <li>• Kwikwetlem First Nation</li> <li>• Tseil-Waututh Nation</li> </ul>	February 22, 2021
17	Document Sharing: Draft Marine Communications Plan	CP provided the draft Marine Communications Plan for review and comment	<ul style="list-style-type: none"> <li>• Kwikwetlem First Nation (comments received)</li> <li>• Tseil-Waututh Nation</li> </ul>	March 23, 2021
18	Document Sharing: Draft Navigational Impact Assessment	CP provided the draft Navigational Impact Assessment for review and comment	<ul style="list-style-type: none"> <li>• Kwikwetlem First Nation (comments received)</li> <li>• Tseil-Waututh Nation</li> </ul>	March 23, 2021



#	Type	Description	Indigenous Communities	Date
19	Document Sharing: Draft Construction Environmental Management Plan (CEMP)	CP provided the draft CEMP for review and comment	<ul style="list-style-type: none"> <li>• Kwikwetlem First Nation (comments received)</li> <li>• Tsleil-Waututh Nation (comments received)</li> </ul>	March 24, 2021
20	Document Sharing: Draft Offsetting Plan	CP provided the draft Offsetting Plan for review and comment	<ul style="list-style-type: none"> <li>• Kwikwetlem First Nation (comments received)</li> <li>• Musqueam Indian Band (comments received)</li> <li>• Tsleil-Waututh Nation (comments received)</li> </ul>	March 24, 2021
21	Document Sharing: Draft Species at Risk Assessment	CP provided the draft Species at Risk Assessment for review and comment	<ul style="list-style-type: none"> <li>• Kwikwetlem First Nation (comments received)</li> <li>• Tsleil-Waututh Nation (comments received)</li> </ul>	April 1, 2021
22	Document Sharing: Land Requirements Figure	CP provided the Land Requirements figure for review and comment	<ul style="list-style-type: none"> <li>• Kwikwetlem First Nation</li> <li>• Tsleil-Waututh Nation</li> </ul>	April 5, 2021
23	Document Sharing: Draft Marine Construction and Staging Plan	CP provided the draft Marine Construction and Staging Plan for review and comment	<ul style="list-style-type: none"> <li>• Kwikwetlem First Nation (comments received)</li> <li>• Tsleil-Waututh Nation</li> </ul>	April 6, 2021
24	Email	CP notified Indigenous communities that the Project's PER and FAA Applications were submitted on June 4, 2021	<ul style="list-style-type: none"> <li>• Kwikwetlem First Nation</li> <li>• Musqueam Indian Band</li> <li>• Tsleil-Waututh Nation</li> <li>• Squamish Nation</li> </ul>	June 7, 2021 June 14, 2021
25	Document Sharing: PER and FAA Applications	CP provided the Project's PER and FAA Applications	<ul style="list-style-type: none"> <li>• Kwikwetlem First Nation</li> </ul>	June 9, 2021
27	Email	CP notified Indigenous communities that the Project's PER and FAA Applications were submitted on June 4, 2021	<ul style="list-style-type: none"> <li>• Cowichan Tribes</li> <li>• Halalt First Nation</li> <li>• Lyackson First Nation</li> <li>• Penelakut Tribe</li> <li>• Seabird Island Band</li> <li>• Stz'uminus First Nation</li> <li>• Ts'uubaa-asatx Nation</li> </ul>	June 25, 2021
28	Meeting	CP met with Kwikwetlem First Nation to discuss several CP projects including the Viterra-Cascadia Expansion Project – Phase 4	<ul style="list-style-type: none"> <li>• Kwikwetlem First Nation</li> </ul>	October 12, 2021
29	Email	CP sent Indigenous communities a Project update including information about CP's PER and FAA re-submission planned for March 2022, offsetting locations,	<ul style="list-style-type: none"> <li>• Kwikwetlem First Nation</li> <li>• Musqueam Indian Band</li> <li>• Squamish Nation</li> <li>• Tsleil-Waututh Nation</li> </ul>	January 20, 2022

#	Type	Description	Indigenous Communities	Date
		and offsetting design. Indigenous communities were invited to meet with CP, if requested.		
30	Monitoring Invitation	CP invited Indigenous communities to send an environmental monitor to participate (virtually or in person) in the sediment sampling characterization program scheduled for March 3, 2022.	<ul style="list-style-type: none"> <li>• Kwikwetlem First Nation</li> <li>• Musqueam Indian Band</li> <li>• Squamish Nation</li> <li>• Tsleil-Waututh Nation</li> </ul>	February 7, 2022

### 3.3 Future Engagement Activities with Participating Indigenous Communities

As the Project advances, CP will continue to engage interested Indigenous communities. Specifically, Kwikwetlem First Nation, Tsleil-Waututh Nation, and Musqueam Indian Band will be provided with additional opportunities to participate in further offset planning and activities. If the Project is approved, Indigenous monitors will be invited to participate in the construction monitoring process, and Indigenous communities will be provided the opportunity to review updated construction-related plans. **Table 3** outlines future engagement activities planned for the Project which Hemmera will conduct on behalf of CP.

**Table 3 Future Engagement Activities**

#	Type	Description	Indigenous Communities	Date
1	Emails and/or Meetings	CP will work with Indigenous communities to reflect additional input and feedback related to offsetting, if provided.	<ul style="list-style-type: none"> <li>• Kwikwetlem First Nation</li> <li>• Musqueam Indian Band</li> <li>• Squamish Nation</li> <li>• Tsleil-Waututh Nation</li> </ul>	2022-2023
2	Email	CP will distribute draft plans related to construction and environmental monitoring as they become available for review and comment. CP will track any comments received on the documents and ensure that they are responded to in an appropriate and timely manner, and are incorporated into Project documents as appropriate	<ul style="list-style-type: none"> <li>• Kwikwetlem First Nation</li> <li>• Musqueam Indian Band</li> <li>• Tsleil-Waututh Nation</li> </ul>	TBD: Prior to Construction
3	Field Monitoring	If the Project is approved, CP will coordinate involvement of Indigenous environmental monitors throughout Project construction. It is anticipated that field monitors from 1-4 Indigenous communities may be interested in participating in monitoring during Project construction.	<ul style="list-style-type: none"> <li>• Kwikwetlem First Nation</li> <li>• Musqueam Indian Band</li> <li>• Squamish Nation</li> <li>• Tsleil-Waututh Nation</li> </ul>	During Construction



### 3.4 Status of Indigenous Engagement to Date

To date, engagement with the identified Indigenous communities has been conducted based on the results of a BC CAD search, the level of interest expressed by each community, proximity to the Project, and anticipated potential impacts based on proximity to the Project. Kwikwetlem First Nation, Musqueam Indian Band, and Tsleil-Waututh Nation have been provided with biophysical workplans for review and are actively involved in offsetting planning. Squamish Nation has been primarily involved in the archaeological program. All other identified Indigenous communities have either not responded to initial communications, shared that they did not have questions or concerns about the Project, or deferred their interest in being engaged. As noted previously, it is understood that Indigenous interests in the Project may change as the Project continues to be advanced.

**Table 4 Status of Indigenous Engagement to Date**

#	Indigenous Community	Status of Engagement to Date
1	Cowichan Tribes	Cowichan Tribes was only providing essential services due to the COVID-19 pandemic and therefore did not respond to Project emails or phone calls up to July 2021. Cowichan Tribes did not actively engage with CP during Phase 3 of the Project.
2	Halalt First Nation	Halalt First Nation responded that they did not have any questions or concerns on July 9, 2020.
3	Kwikwetlem First Nation	Kwikwetlem First Nation expressed an interest in the Project, participated in a Project introduction meeting with CP, participated in two offsetting workshops with CP, participated virtually in archaeological monitoring, received, reviewed, and commented on the draft AEA, draft CEMP, draft Offsetting Plan, and other draft documents, plans and reports that CP submitted as part of their June 4, 2021 PER and FAA Applications. A redline version of the updated Offsetting Plan will be shared with Kwikwetlem First Nation for their review and comment. CP provided a copy of the Project's June 4, 2021 PER and FAA Applications and will notify Kwikwetlem First Nation of their re-submission to the Port and DFO in March 2022.
4	Lyackson First Nation	Lyackson First Nation has not shared comments or concerns about the Project.
5	Musqueam Indian Band	Musqueam Indian Band expressed an interest in being involved in Project offsetting discussions, participated virtually in archaeological monitoring, and received the draft AIA and draft Offsetting Plan for review and comment. A redline version of the updated Offsetting Plan will be shared with Musqueam Indian Band for their review and comment. CP notified Musqueam Indian Band that their PER and FAA Applications were submitted on June 4, 2021 and will notify Musqueam Indian Band of their re-submission to the Port and DFO in March 2022.
6	Penelakut Tribe	Penelakut Tribe has not shared comments or concerns about the Project.
7	Seabird Island Band	Seabird Island Band has not shared comments or concerns about the Project.
8	Squamish Nation	Squamish Nation participated in archaeological monitoring, has received archaeological updates, has confirmed there are no concerns identified at this time, and will provide a Chance Find Procedure for consideration as the Project proceeds. A redline version of the updated Offsetting Plan will be shared with Squamish Nation for their review and comment. CP notified Squamish Nation that their PER and FAA Applications were submitted on June 4, 2021 and will notify Squamish Nation of their re-submission to the Port and DFO in March 2022.
9	Stó:lō Nation	The Stó:lō Nation deferred involvement in the Project and received the archaeological notification and AIA Report as requested. No concerns about the Project have been raised.

#	Indigenous Community	Status of Engagement to Date
10	Stz'uminus First Nation	Stz'uminus First Nation has not shared comments or concerns about the Project.
11	Tsleil-Waututh Nation	Tsleil-Waututh Nation shared that the Project is of high concern to the Nation, provided initial written comments, participated in two offsetting workshops, participated virtually in archaeological monitoring. Received, reviewed, and commented on the draft AEA, draft CEMP, draft Offsetting Plan, and other draft documents, plans and reports that CP submitted as part of their June 4, 2021 PER and FAA Applications. A redline version of the updated Offsetting Plan will be shared with Tsleil-Waututh Nation for their review and comment. CP notified Tsleil-Waututh Nation that their PER and FAA Applications were submitted on June 4, 2021 and will notify Tsleil-Waututh Nation of their re-submission to the Port and DFO in March 2022.
12	Ts'uubaa-asatx Nation	Ts'uubaa-asatx Nation has not shared comments or concerns about the Project.

## 4.0 FEEDBACK, ISSUES, AND INTERESTS

**Table 5** presents issues, interests, and concerns identified by Kwikwetlem First Nation, Musqueam Indian Band, Squamish Nation, and Tsleil-Waututh Nation up to May 27, 2021. Other Indigenous communities have not yet provided written or verbal comments on the Project. **Table 6** presents feedback provided by Kwikwetlem First Nation, Musqueam Indian Band, and Tsleil-Waututh Nation through Project-document review up to February 7, 2022.

Kwikwetlem First Nation has not identified any major concerns with the Project, and expressed the importance of protecting bull kelp, herring, crabs, and salmon rearing habitat. Kwikwetlem First Nation asserts their rights, title, and stewardship interests over all lands, waters, and resources within Kwikwetlem First Nation Traditional Territory including areas in and around the Project and confirmed with the project that fish and fish habitat has significant cultural value. Kwikwetlem First Nation has also requested continued and ongoing engagement, specifically with respect to opportunities to participate in environmental monitoring and offsetting activities, and review project documents. Kwikwetlem First Nation reaffirmed their positive feedback on the offsetting design submitted to the Port and DFO on June 4, 2021, and expressed interest in CP using the same design for one of the new locations proposed by the Port. Noted offsetting efforts on the eastern side of Burrard Inlet should be prioritized. Kwikwetlem First Nation expressed that moving the offsetting locations will require significant document review efforts.

Musqueam Indian Band expressed interest in participating in archaeological activities and offsetting planning including the discussion of habitat valuation and assessment. Squamish Nation also expressed interest in participating in archaeological activities and CP will provide a Chance Find Procedure as the Project advances.

Tsleil-Waututh Nation has expressed concerns regarding the increasing amount of rip rap along the shoreline in Burrard Inlet as it could potentially lead to further loss of intertidal habitat if sea levels rise due to climate change. Tsleil-Waututh Nation also expressed strong support for offsetting to focus on juvenile salmon habitat and features to protect them from predation. Based on written feedback, the Aquatics Effects Assessment was updated to acknowledge that Tsleil-Waututh Nation, and other Indigenous communities, have occupied Burrard Inlet for thousands of years. Tsleil-Waututh Nation requested continued engagement and opportunities to participate in environmental and offsetting activities and review documents. They also expressed concern about the decline of marine mammals, the importance of planting



culturally important vegetation species, preventing the spread of invasive species, and requested the Project to take further measures to both identify and protect amphibians.

During offsetting workshops and through Project document review, both Kwikwetlem First Nation and Tsleil-Waututh Nation discussed numerous priorities, requests and recommendations related to offsetting, which have informed the further development of the Offsetting Plan, Marine Communications Plan, Navigational Impact Assessment, Construction Environmental Management Plan, Aquatics Effects Assessment, Species at Risk and Vegetation Assessment, and the Marine Construction Plan.

**Table 5 Issues and Interests Shared to Date**

Method	Comment/Concern	Response
<b>Kwkwetlem First Nation</b>		
Initial Meeting	Requested involvement in archaeological and environmental programs as well as opportunities to review related studies.	CP provided archaeological and environmental monitoring opportunities and shared related documents for review and comment (e.g., draft biophysical workplan and daily archaeological summaries).
Offsetting Workshops	Requested involvement of Kwkwetlem First Nation monitors during construction and effectiveness monitoring.	Kwkwetlem First Nation monitors will be invited to participate in construction and effectiveness monitoring if the Project is approved.
	Expressed interest in the removal of creosote piles near the Project.	CP confirmed that the tenant near the creosote piles close to Port Moody would not give them access to remove the creosote piles.
	Requested further detail on species/habitats to be enhanced, productivity estimates, and feasibility. Shared interest in promoting herring spawning and reducing juvenile salmon mortality.	CP/Hemmera shared the draft AEA and the draft Offsetting Plan with Kwkwetlem First Nation for review and comment.
	Shared additional requests/recommendations related to offsetting planning. For example, KFN expressed interest in enhancing rockfish, surf smelt seeding, and ball kelp as well as the use of natural and artificial substrates in the offsetting design.	CP/Hemmera shared the draft ARA and the draft Offsetting Plan with Kwkwetlem First Nation for review and comment.
Phone/Email	Expressed interest in participating in offsetting planning. Noted interest for rockfish offsetting options.	CP/Hemmera shared the draft Offsetting Plan (June 4, 2021 version) with Kwkwetlem First Nation for review and comment.
Meeting	Kwkwetlem First Nation reaffirmed their positive feedback on the offsetting design submitted to the Port and DFO on June 4, 2021, and expressed interest in CP using the same design for one of the new locations proposed by the Port. Noted offsetting efforts on the eastern side of Burrard Inlet should be prioritized. Kwkwetlem First Nation expressed that moving the offsetting locations will require significant document review efforts.	CP/Hemmera will share the revised Offsetting Plan with Kwkwetlem First Nation for review and comment. A redline version will also be provided to focus Kwkwetlem First Nation’s review on information that has been revised and/or added since their initial review in Spring 2021.
<b>Musqueam Indian Band</b>		
Email	Expressed interest in participating in an offsetting workshop.	CP/Hemmera continue to invite Musqueam Indian Band to meet for an offsetting workshop.
	Expressed interest in reviewing the draft Offsetting Plan.	CP/Hemmera will share the draft Offsetting Plan with Musqueam Indian Band for review and comment.
	Expressed interest in archaeology.	CP provided archaeological monitoring opportunities and shared related documents for review and comment (e.g., daily archaeological summaries).

Method	Comment/Concern	Response
<b>Squamish Nation</b>		
Email	Expressed interest in archaeology.	CP provided archaeological monitoring opportunities and shared related documents for review and comment (e.g., daily archaeological summaries).
<b>Tsleil-Waututh Nation</b>		
Initial Meeting	Shared numerous requests/recommendations related to offsetting planning. For example, considering habitat rarity and productivity. Expressed preference to use offsetting options that do not involve rock reef. Shared that clams are culturally significant.	CP/Hemmera shared the draft Aquatic Effects Assessment (AEA) and will share the draft Offsetting Plan with Tsleil-Waututh Nation for review and comment.
	Requested capacity funding to support involvement in the Project.	CP approved Tsleil-Waututh Nation’s cost estimate and has issued them a Purchase Order for invoicing.
	Concerned with rocks on the south shore of Burrard Inlet near Capitol Hill and impacts to water quality.	CP confirmed that rocks on the south Shore of Burrard Inlet near Capitol Hill are not part of CP projects.
	Concerned with the amount of rip rap in Burrard Inlet and resulting “shoreline squeeze” (i.e., losing the intertidal zone following subsequent sea level rise related to climate change).	CP/Hemmera will consider offsetting options that promote climate resiliency.
Offsetting Workshops	Requested further detail on species/habitats to be enhanced, removing invasive species, and monitoring options (e.g., measuring association between salmon and the nodes).	CP/Hemmera shared the draft AEA and will share the draft Offsetting Plan with Tsleil-Waututh Nation for review and comment.
	Shared additional requests/recommendations related to offsetting planning. For example, supports habitat complexity in the Burrard Inlet, increasing kelp in the Burrard Inlet, interest removing invasive species, and interest in various monitoring options (e.g., measuring associations between salmon and nodes).	CP/Hemmera shared the draft Aquatic Effects Assessment (AEA) and will share the draft Offsetting Plan with Tsleil-Waututh Nation for review and comment.
Phone/Email	Expressed interest in funding for ecological studies in Burrard Inlet to support research goals and continued restoration of marine habitat.	CP confirmed looking into funding opportunities within the parameters of DFO offsetting requirements.
	Shared offsetting feedback and expressed strong support for the focus on juvenile salmon habitat and features to protect them from predation as well as the proposed multi-bench approach to node design and having numerous offsetting sites as opposed to one large area. Requested connecting the Phase 3 and Phase 4 offsetting work on kelp beds. Expressed concern around not having an opportunity to participate in offsetting site selection conversations, ninety-degree angles as part of the node design, contamination leaching into the environment from concrete, and the use of geotextiles and plastic-based materials used in the offsetting design.	CP/Hemmera provided detailed responses to Tsleil-Waututh Nation’s concerns and received confirmation that they were happy with the responses provided. CP/Hemmera shared the draft AEA and will share the draft Offsetting Plan with Tsleil-Waututh Nation for review and comment.



**Table 6 Summarized Feedback Shared Through Document Review**

Method	Feedback	Response
<b>Kwikwetlem First Nation</b>		
Document Review	The rigor of assessments to confirm the biophysical conditions in the Aquatics Effects Assessment (AEA) seems sufficient, and the AEA clearly describes the Project, potential or anticipated Project effects, and avoidance / mitigation measures.	CP thanked Kwikwetlem First Nation for this feedback.
	Kwikwetlem First Nation expressed the importance of bull kelp, herring, crabs, and salmon rearing habitat, migration corridors and staging areas.	CP noted these species and items of importance, and, where possible discussed the engineering, monitoring, and data opportunities and constraints to enhance habitat.
	In multiple documents, there was a request for continued engagement including opportunities to participate in environmental monitoring, field studies, continued review of updated or yet-to-be-drafted Project plans, monitoring reports, work commencement notifications, emergency notifications, and meetings and/or updates as required.	CP will engage Indigenous communities throughout the life of the Project, including providing opportunities to participate in environmental monitoring, field studies and to review updated documents and newly drafted Project-specific plans including environmental monitoring reports. CP will inform Indigenous communities of work commencing and will provide notification of emergencies as possible throughout the life of the Project. CP will also continue to provide updates to Indigenous communities as requested through their preferred method(s) of communication.
	Kwikwetlem First Nation asserts their rights, title, and stewardship interests over all lands, waters, and resources within Kwikwetlem First Nation traditional territory including areas in and around the Project and expects meaningful consultation and opportunities to comment on the Project throughout development.	CP acknowledges Kwikwetlem First Nation's assertion. While formal consultation will be performed by the Vancouver Fraser Port Authority (Port Authority) and DFO during the respective Vancouver Fraser Port Authority Project and Environmental Review Application and <i>Fisheries Act</i> Authorization Application review periods, CP looks forward to continued engagement with Kwikwetlem First Nation throughout the Project.
	There is a concern for resident fish (e.g., rockfish) to be present and potentially vulnerable during work scheduled outside the fish habitat protection window.	The fish habitat protection windows are designed to protect sensitive life history stages (eggs, larva, juvenile) of the majority of fish species and in particular species of commercial and cultural importance (Pacific salmon, herring, etc.). Resident fish species are anticipated to remain within the Project footprint. Potential impacts, mitigation measures, and potential residual effects are addressed in the Aquatic Effects Assessment prepared for the Project.
	The Fish and Fish Habitat discussed in the Construction Environmental Management Plan (CEMP) has cultural value to Kwikwetlem First Nation, and that is not mentioned in the CEMP.	CP acknowledges that the Project area, including the fish & fish habitat has cultural value to Kwikwetlem First Nation.

Method	Feedback	Response
	Is the difference in exposure to underwater sound pressures considered between fish that have, or do not have, sound bladders?	Yes, fish that do and do not have sound bladders have been considered. The sound pressure guidelines to avoid injury or mortality to fish are established at the most conservative levels to protect the most sensitive species.
	Will there be signage for this work, in part for education, but also to protect these habitats while they are restored and after (kelp in particular)?	The offsetting habitats will be constructed offshore, and the south shore of Burrard Inlet is inaccessible from Burnaby Mountain. This means foot traffic in the vicinity of the habitats is not anticipated. Notice to mariners and signage for navigation will be installed in accordance with Port Authority requirements.
	Will the minor seabed disturbance anticipated to be caused by marine barges when using the spuds to anchor be minimized? Will this disturbance be monitored? Is there an estimate as to how long the seabed may take to repair itself?	<p>While the disturbance is unavoidable, efforts will be made to ensure the impact is limited (i.e. the spuds being lifted fully off the seafloor before moving to avoid dragging, positioning barge properly to avoid having to anchor down multiple times, maximising placement zone per anchor location to avoid multiple movements, etc.)</p> <p>It would be very difficult and impractical to monitor moving spuds and their impact. Given the small footprint (0.25m<sup>3</sup>) of the spud impact zone, it was not identified as an aspect of the construction that would be monitored. Monitoring efforts will be directed to the placement of infill and embankment construction.</p> <p>The seafloor will naturally fill in the voids as the spuds are removed. Within a couple of tidal cycles, the spud zones will be indistinguishable from the adjacent sediment.</p>
<b>Musqueam Indian Band</b>		
Document Review	Musqueam does not agree with the productivity method of habitat valuation (the goal should be to increase habitat value).	<p>Habitat equivalency is a standard approach to measuring impacts and for determining the requirements for offsetting, which should be equal to or greater than the damage caused by the Project to the existing environment. The required offsetting area has been increased to account for the lag time (i.e., time for habitat to colonize and become biologically productive) and uncertainty (where uncertainty includes ecosystem dynamics per the applied equivalency metrics).</p> <p><i>[References were provided back to Musqueam Indian Band confirming sources guiding habitat valuation approach]</i></p>
	Is building offsetting habitat concurrently with project work expected to be successful given project noise and activity likely scaring away colonizing species?	Colonization of the offsetting habitats is expected to occur over the 5 years following construction. The primary algal and invertebrate species expected to colonize will settle out of the water column in response to water and substrate cues. Construction activities are not expected to influence the settlement of larval organisms.

Method	Feedback	Response
<b>Tsleil-Waututh Nation</b>		
Document Review	<p>There is no acknowledgement of the First Nations territory that the Project footprint is within that has been occupied since time immemorial. Tsleil-Waututh Nation has occupied villages throughout Burrard Inlet for thousands of years and requires that this be updated to appropriately include all locally affected First Nations.</p>	<p>CP acknowledges that Indigenous communities have occupied the project area and surroundings lands since time immemorial. The Aquatics Effects Assessment has been updated to reflect this acknowledgement.</p>
	<p>Tsleil-Waututh Nation provided multiple comments around the collection of water samples including environmental conditions, turbidity, location, and methodology.</p>	<p>CP would like to clarify that it cannot confirm if construction activity was impacting the water quality of the creek during the time for field work, however turbidity was within BC water quality guidelines at the time of fieldwork.  The closest water sample (T3) was taken approximately 40m downstream of the culvert construction. Water quality data was recorded using a YSI Pro DSS.</p>
	<p>Tsleil-Waututh Nation requested any information gathered regarding the presence of shorebirds in the area, particularly the Great Blue Heron which is a SARA-listed species.</p>	<p>Shorebird or Great Blue Heron surveys were not specifically conducted as part of the Aquatics Effects Assessment because their use of the area is conservatively estimated to be continuous during construction and operation of the Project. Background information on shorebirds is presented in Section 4.3.1 of the Aquatics Effects Assessment and information on Great Blue Heron is presented in Section 4.4 of the Aquatics Effects Assessment.</p>
	<p>Despite the study area not being suitable habitat for cetaceans known to visit Burrard inlet, Tsleil-Waututh Nation requested acknowledgement that the area does support the species preyed upon by marine mammals. A decrease in prey availability is one of the identified leading causes of declining populations in cetaceans, particularly orcas.</p>	<p>The acknowledgement that the area does support the species preyed upon by marine mammals has been added to the Aquatics Effects Assessment.</p>
	<p>In multiple documents, there was a request for continued engagement including opportunities to participate in environmental monitoring, field studies, continued review of updated or yet-to-be-drafted Project plans, monitoring reports, work commencement notifications, emergency notifications, and meetings and/or updates as required.</p>	<p>CP will engage Indigenous communities throughout the life of the Project, including providing opportunities to participate in environmental monitoring, field studies and to review updated documents and newly drafted Project-specific plans including environmental monitoring reports. CP will inform Indigenous communities of work commencing and will provide notification of emergencies as possible throughout the life of the Project. CP will also continue to provide updates to Indigenous communities as requested through their preferred method(s) of communication.</p>



Method	Feedback	Response
	<p>Tsleil-Waututh Nation made multiple comments around invasive vegetation species including a request to use seed-free straw bales for erosion control and containing the spread of invasive species during construction.</p>	<p>CP suggested free straw haybales to be an option for erosion control measures. General guidelines for vegetation and invasive species management best practices are outlined in the CEMP. Guidelines cover:</p> <ul style="list-style-type: none"> <li>• The appropriate disposal of invasive plant species</li> <li>• The removal of invasive species by hand or shovel</li> <li>• Implementing truck wash stations and vehicle inspections</li> <li>• Ensuring soils brought to site are free of environmental contamination, invasive species, and noxious weeds.</li> </ul>
	<p>Tsleil-Waututh Nation made multiple comments on amphibians including:</p> <ul style="list-style-type: none"> <li>• Surveys be conducted for Red-legged Frog, Salamander, Pacific Tailed Frog, and Northern Red-legged Frog</li> <li>• Training of construction crew to identify the Northern Reed-legged Frog</li> <li>• Amphibian gates be considered as part of the new culvert design</li> </ul>	<ul style="list-style-type: none"> <li>• The addition of survey in the early surveys in the spring for the presence of amphibian egg sacs has been added to the Construction Environmental Management Plan.</li> <li>• An identification document will be created as a guide for construction and environmental monitoring crews to follow and improve amphibian identification techniques.</li> <li>• The recommendation to include grates in the culvert extension design has been added to the Species at Risk and Vegetation Report.</li> </ul>
	<p>Planting of native species of cultural importance to the Tsleil-Waututh people is requested, where possible. Species of cultural importance include Western Red Cedar, Sitka Spruce, Pacific Yew, Pacific Crabapple, Beaked Hazelnut, Trailing Blackberry, Huckleberry, Currants, Chocolate Lily, Cascara, Arnica, Hellebora, False Lily of the Valley, Stinging Nettle, Pacific Water parsley, Rattlesnake Orchid and Rosehips.</p>	<p>CP acknowledges the native species of cultural importance to the Tsleil-Waututh Nation and will endeavor to plant those species where potential opportunities are identified. However, at this time CP does not anticipate any seeding or replanting to take place</p>
	<p>Tsleil-Waututh Nation requests information regarding any known wildlife movement corridors. If there are none, it is requested that consideration be made to create opportunities and safe spaces for wildlife movement.</p>	<p>There are no known wildlife movement corridors within the Project area. CP will inform the design team of the request to incorporate a wildlife movement corridor. The design team will, ultimately, decide if a wildlife corridor can be incorporated.</p>

## 5.0 CLOSURE

CP continues to engage Indigenous communities in an ongoing effort to identify, document, and address feedback, comments or concerns related to any potential adverse Project impacts. Of the Indigenous communities initially identified for engagement, Kwikwetlem First Nation, Musqueam Indian Band and Tsleil-Waututh Nation have been involved to date in habitat offsetting planning, Project document review, and the archaeological program. Squamish Nation was also involved in the archaeological program. Additional opportunities for meaningful involvement will continue to be provided as the Project advances including opportunities to participate in environmental monitoring, field visits, and to review further Project plans and reports.

Hemmera sincerely appreciates the opportunity to provide ongoing engagement support for this project and if there are any questions in relation to the contents of this summary report, please do not hesitate to contact the undersigned by phone at 778.320.0409 or email at [mtanner@hemmera.com](mailto:mtanner@hemmera.com).

Report prepared by:  
**Hemmera Envirochem Inc.**

Report reviewed by:  
**Hemmera Envirochem Inc.**

Eliza Bethune, BA, MPPGA  
Engagement Lead

Morgan Tanner, BA  
Director, Human Environment

# **APPENDIX A**

## **Engagement Plan**



# MEMORANDUM

Date:	Updated: May 2021
To:	Kiley Gibson and Joe Van Humbeck (CP)
From:	Morgan Tanner (Hemmera)
File:	104703-01
Re:	<b>Viterra-Cascadia Terminal Expansion Project – Phase 4: Draft Indigenous Engagement and Consultation Plan</b>

## 1.0 PROJECT OVERVIEW

CP has initiated planning for Phase 4 of the Viterra-Cascadia Terminal Capacity Expansion Project (the Project) along the south shore of Burrard Inlet in Burnaby, British Columbia (BC). The Project will involve construction of a 1,500-m extension to the existing third track, which will build on the 300-m extension currently being constructed as part of Phase 3. To expand the track, CP will widen the existing rail bed by placing clean, engineered fill material into the intertidal and potentially subtidal marine environment in Burrard Inlet. CP is currently considering options for the Project footprint, as well as construction methods.

The Project will require a Category C approval from the Vancouver Fraser Port Authority (Port Authority) through their Project and Environmental Review (PER) process and likely a lease from the Port Authority for the expanded track. A *Fisheries Act* Authorization (FAA) from Fisheries and Oceans Canada (DFO) is also required and will necessitate offsetting for any residual adverse effects to fish and fish habitat.

## 2.0 OBJECTIVES OF ENGAGEMENT AND CONSULTATION

The Crown, as represented by Port Authority for this Project, holds the duty to consult and, where necessary, accommodate Indigenous communities affected by the Project.<sup>1</sup> The Port Authority is leading consultation, and Hemmera, on behalf of CP, will conduct engagement activities in support of consultation. Engagement is a broad term that encompasses such activities as relationship building, information sharing, discussion of issues and concerns, and discussion of Project logistics. Engagement activities are typically part of the consultation process; they may constitute procedural aspects of consultation.

The objectives of engagement and consultation conducted by Hemmera, on behalf of CP, are to:

1. Identify Indigenous communities with Aboriginal Interests (i.e., Aboriginal rights, including title) overlapping the Project area.
2. Develop collaborative working relationships with potentially impacted Indigenous communities by sharing Project information and providing opportunities for Indigenous communities to share comments, concerns, and recommendations regarding Project activities (e.g., offsetting).
3. Help ensure that adverse impacts to Aboriginal Interests (i.e., Aboriginal rights, including title) resulting from the Project are appropriately identified, mitigated, and/or offset.

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<sup>1</sup> Haida Nation v. British Columbia (Minister of Forests), 2004 SCC 73, 3 SCR 511 at paras 14, 18, 20 and 53

### 3.0 POTENTIALLY IMPACTED INDIGENOUS COMMUNITIES

According to the BC Consultative Areas Database (CAD), eleven Indigenous communities may have Aboriginal Interests within the Project area:

4. Cowichan Tribes
5. Halalt First Nation
6. Lyackson First Nation
7. Musqueam Indian Band
8. Penelakut Tribe
9. Seabird Island Band
10. Stó:lō Nation including:
  - Shxw'ōwhámél First Nation
  - Skawahlook First Nation
  - Soowahlie First Nation
11. Stz'uminus First Nation
12. Squamish Nation
13. Tseil-Waututh Nation
14. Ts'uubaa-asatx Nation (formerly known as Lake Cowichan First Nation).

Of these Indigenous communities, it is anticipated that Tseil-Waututh Nation, Musqueam Indian Band, and Squamish Nation will be interested in participating in the Project review process, as these Indigenous communities are located closest to the Project footprint. Additionally, Tseil-Waututh Nation participated in the Project review process for Phase 3 by attending meetings with CP and reviewing application components. It is anticipated that the other twelve Indigenous communities will not be interested in participating in the Project review process or will defer to other Indigenous communities more directly affected by the Project.

CP may also wish to engage and consult with Kwikwetlem First Nation, although they were not identified in the CAD search as Kwikwetlem First Nation was engaged during the Viterro-Cascadia Expansion - Phase 3 Project (Phase 3). Kwikwetlem First Nation reviewed and provided comment on the including discussions on the Habitat Assessment, Offsetting Plan, and Construction Environmental Management Plan. They were also involved in offsetting workshops and related meetings.

As needed, Hemmera will coordinate with the Port Authority to identify and confirm potentially impacted Indigenous communities and help ensure that engagement and consultation activities follow a consistent approach.

## 4.0 ACTIVITIES AND PROPOSED SCHEDULE

A minimum of nine key engagement activities with Indigenous communities will be completed throughout the Project (see **Table 1**). To initiate the engagement process, Hemmera will send a notification letter electronically to the Indigenous communities identified in the CAD search, as well as Kwikwetlem First Nation. One submission will be made to the People of the River Referrals Office via their referrals portal, Stó:lō Connect, for the Stó:lō Nation, Shxw'ōwhámél First Nation, Skawahlook First Nation, and Soowahlie First Nation.

Hemmera will follow up with Indigenous communities by telephone to help ensure that the appropriate contact received the Project introduction letter and to answer any preliminary questions. Once this initial communication has been received, it is anticipated that most of the sixteen Indigenous communities will indicate that they do not wish to participate further in the Project review process.

As discussed in **Section 4.0**, it is anticipated that up to four Indigenous communities will likely express an interest in the Project (i.e., Tsleil-Waututh Nation, Musqueam Indian Band, Squamish Nation, and Kwikwetlem First Nation). Hemmera will coordinate additional engagement and consultation activities with Indigenous communities that express an interest in the Project to help ensure that their questions and concerns are addressed throughout the Project. As shown in **Table 1**, these activities may include an introductory meeting, fieldwork during the archaeological impact assessment, opportunities to review and comment on the draft PER application and FAA application documents, a meeting to discuss the applications and offsetting options, and field monitoring during construction. Specific engagement and consultation activities will be adapted according to Indigenous communities' preferences and requests; the activities and schedule in **Table 1** are subject to change.

**Table 1 Proposed Activities and Schedule**

#	Type	Description	Tentative Date
<b>Engagement with all potentially impacted Indigenous communities:</b>			
1	Email/ Stó:lō Connect	Hemmera will email a Project introduction letter and KMZ file to potentially impacted Indigenous communities. As CP is working on several projects that affect the same Indigenous communities, a single letter for several projects may be issued.	April 9, 2020 (complete)
2	Phone	Hemmera will phone the Indigenous communities to see if they have received the Project materials and have any questions unless a response has already been received.	Mid-April (complete)
<b>Engagement with Indigenous communities that express an interest in the Project:</b>			
3	Email	Terra Archaeology, a subcontractor of Hemmera, will provide a notification letter to Indigenous communities with respect to the archaeological impact assessment (AIA) conducted for the Project. Terra Archaeology will also apply for Heritage Inspection Permits from relevant Indigenous communities.	April 13, 2020 (complete)
4	Meeting	CP and Hemmera will meet with Indigenous communities that express an interest in the Project. It is anticipated that up to four Indigenous communities will wish to meet with CP. While in-person meetings are preferred, meetings will likely be held via teleconference due to COVID-19-related physical distancing considerations.	April-May 2020 (complete)



#	Type	Description	Tentative Date
5	Participation in Geotechnical Program	Indigenous communities that express an interest in the Project will be invited to observe samples obtained during the geotechnical program, either in-person or virtually depending on COVID-19 restrictions.	May/June 2020 (complete)
6	Participation in Archaeological Field Survey	Terra Archaeology will invite Indigenous communities that were involved in the geotechnical program to also participate in the field survey that will inform the AIA. As some Indigenous communities are not currently participating in field work, the field survey will be scheduled to, ideally, coincide with Indigenous communities' resumption of field activities.	June/July 2020 (complete)
7	Meeting	CP and Hemmera will meet with Indigenous communities to discuss the draft PER application and FAA application. A focus of these meetings will be to obtain feedback on proposed offsetting options associated with the FAA.	August 2020 – application decision
8	Email	Hemmera will distribute draft PER application and FAA application documents to Indigenous communities for their review and comment. Hemmera will track any comments received on the documents in the consultation log and ensure that they are responded to in an appropriate and timely manner (see <b>Section 5.0</b> ).	Q1, 2021
9	Field Monitoring	Hemmera will coordinate involvement of Indigenous environmental monitors throughout Project construction. It is anticipated that field monitors from 1-3 Indigenous communities will participate.	Project construction

#### 4.1 COVID-19 Considerations

As a result of the ongoing COVID-19 pandemic, operations at many Indigenous communities have been affected, which may in turn affect anticipated timelines and engagement activities. Some Indigenous communities continue to operate virtually, while others have reduced or suspended their service offerings. Additionally, many Indigenous communities are not currently participating in fieldwork due to health and safety concerns.

Hemmera is currently monitoring which Indigenous communities are open, available to respond to referrals, and participating in fieldwork to inform engagement programs and anticipate any delays. It may not be appropriate to move forward with engagement activities if Indigenous communities are not able to meaningfully participate. Hemmera will work with CP to ensure that engagement activities are conducted in a respectful and culturally appropriate manner during this uncertain time.

If Indigenous communities are available, Hemmera will propose alternatives to in-person meetings and activities to accommodate social distancing measures and restrictions on in-person gatherings. These may include:

- Online meetings using user-friendly digital platforms (e.g., Skype, Zoom, WebEx)
- Teleconferences
- Virtual environmental monitoring (e.g., using live video or regular “spot checks”)
- Other tools recommended by Indigenous communities.

Hemmera will work with CP and Indigenous communities to adapt engagement methods as the COVID-19 situation evolves.

## 5.0 ENGAGEMENT AND CONSULTATION LOG

Hemmera will develop a log to track engagement and consultation communications and activities with potentially impacted Indigenous communities. This log will help ensure that Indigenous communities' questions, comments, and concerns regarding the Project are appropriately addressed throughout all Project phases. Additionally, the log will inform the summary of consultation for the PER and FAA applications. Pending discussion with and approval by CP, SmartComment, a secure, online comment tracking platform, may be used to develop the log. The log will include such details as:

- Date of communication or activity
- Indigenous nation
- Type of communication or activity
- Sender, recipient and/or attendees
- Summary of communication or activity, including key information shared or discussed
- Questions, comments, and concerns raised by Indigenous communities
- Responses to questions, comments, and concerns raised by Indigenous communities
- Action items
- Status of action items

## 6.0 ENGAGEMENT AND CONSULTATION REPORT

Hemmera will prepare an early engagement and consultation report to be submitted with the Port Authority Category C permit application and FAA application. The consultation report will include such information as Indigenous communities that were engaged, a description of engagement activities, and a summary of any issues or concerns that were raised by Indigenous communities and how they were addressed. The detailed engagement and consultation log will be appended to the consultation report. This report will be provided to CP in draft form for review and comment prior to finalization and submission to the Port Authority and DFO.

## 7.0 CLOSING AND NEXT STEPS

By implementing the activities in this plan, Hemmera will continue to support CP to meaningfully engage Indigenous communities potentially affected by the Project. This will help ensure that any potential concerns and adverse impacts on Indigenous communities are identified early in Project development and addressed as soon as possible, as well as fulfill permitting requirements.

Next steps in plan development include:

- CP to review and provide comment on the plan.
- Hemmera to revise the plan as needed.

### 7.1 November 2020 Updates

Updates were made to this memo on November 25, 2020 including:

- Removing confidential information to for submission with the Port Authority Category C Permit Application.
- Confirming completed engagement activities in Table 1
- Updating Hemmera's contact information

# **APPENDIX B**

## **Engagement Log**



## Engagement Log

Date	Indigenous Community	Method	Sender/Attendee	Recipient	Description	Attachment(s)	Current Actions	Project Phase
9-Apr-20	Squamish Nation	Email	Celine Lee, Hemmera	Chiefs and Councillors of the Squamish Nation, SN cc: Kiley Gibson, CP Morgan Tanner, Hemmera	Hemmera sent the Project introduction letter on behalf of Canadian Pacific (CP).	Letter, Project Location KMZ	N/A	Pre-application
9-Apr-20	Tsleil-Waututh Nation	Email	Celine Lee, Hemmera	Chantal Kitamura, Consultation and Accommodation Manager, TWN cc: Ernie George, TWN Michelle George, TWN Kiley Gibson, CP Morgan Tanner, Hemmera	Hemmera sent the Project introduction letter on behalf of CP.	Letter, Project Location KMZ	N/A	Pre-application
9-Apr-20	Kwkwetlem First Nation	Email	Celine Lee, Hemmera	Chief Ed Hall and Councillors, KFN cc: Robert Corman, KFN Lance Myers, KFN Reaman Miller, KFN George Chaffee, KFN Deborah Martelluzzi, KFN Craig Orr, KFN Nicole Oakes, KFN Kiley Gibson, CP Mike LoVecchio, CP Morgan Tanner, Hemmera	Hemmera sent the Project introduction letter on behalf of CP.	Letter, Project Location KMZ	N/A	Pre-application
9-Apr-20	Cowichan Tribes	Email	Celine Lee, Hemmera	Chief William "Chip" Seymour and Councillors, CT cc: Eamon Gaunt, CT Natalie Anderson, CT Candace Charlie, CT Kiley Gibson, CP Morgan Tanner, Hemmera	Hemmera sent the Project introduction letter on behalf of CP.	Letter, Project Location KMZ	N/A	Pre-application
9-Apr-20	Halalt First Nation	Email	Celine Lee, Hemmera	Chief James Thomas and Councillors, HFN cc: Kiley Gibson, CP Morgan Tanner, Hemmera	Hemmera sent the Project introduction letter on behalf of CP.	Letter, Project Location KMZ	N/A	Pre-application
9-Apr-20	Lake Cowichan First Nation	Email	Celine Lee, Hemmera	Chief Councillor Georgina Livingstone and Councillors, LCFN cc: Aaron Hamilton, LCFN Carole Livingstone, LCFN Kylie Gibson, CP Morgan Tanner, Hemmera	Hemmera sent the Project introduction letter on behalf of CP.	Letter, Project Location KMZ	N/A	Pre-application
9-Apr-20	Lyackson First Nation	Email	Celine Lee, Hemmera	Chief Pahalicktun (Richard Thomas) and Councillors, LFN cc: Linda Aidnell, LFN Kiley Gibson, CP Morgan Tanner, Hemmera	Hemmera sent the Project introduction letter on behalf of CP.	Letter, Project Location KMZ	N/A	Pre-application
9-Apr-20	Musqueam Indian Band	Email	Celine Lee, Hemmera	Chief Wayne Sparrow and Councillors, MIB cc: Debbie Miller, MIB Katherine Wheatley, MIB Kiley Gibson, CP Morgan Tanner, Hemmera	Hemmera sent the Project introduction letter on behalf of CP.	Letter, Project Location KMZ	N/A	Pre-application
9-Apr-20	Penelakut Tribe	Email	Celine Lee, Hemmera	Chief Joan Brown and Councillors c/o Josh James, PT cc: Kiley Gibson, CP Morgan Tanner, Hemmera	Hemmera sent the Project introduction letter on behalf of CP.	Letter, Project Location KMZ	N/A	Pre-application
9-Apr-20	Seabird Island Band	Email	Celine Lee, Hemmera	Chief Clem Seymour and Councillors c/o Effie Ned, SIB cc: Kiley Gibson, CP Morgan Tanner, Hemmera	Hemmera sent the Project introduction letter on behalf of CP.	Letter, Project Location KMZ	N/A	Pre-application
9-Apr-20	Stó:lō Nation	Stó:lō Connect	Celine Lee, Hemmera	Stó:lō Connect	Hemmera sent the Project introduction letter on behalf of CP.	Letter, Project Location KMZ	N/A	Pre-application
9-Apr-20	Stz'uminus First Nation	Email	Celine Lee, Hemmera	Chief John Elliott and Councillors, SFN cc: Ronda Jordan, SFN Kiley Gibson, CP Morgan Tanner, Hemmera	Hemmera sent the Project introduction letter on behalf of CP.	Letter, Project Location KMZ	N/A	Pre-application

## Engagement Log

Date	Indigenous Community	Method	Sender/Attendee	Recipient	Description	Attachment(s)	Current Actions	Project Phase
9-Apr-20	Cowichan Tribes	Email	Candace Charlie, CT	Celine Lee, Hemmera	Confirmed receipt of letter. Noted that referral coordinator@cowichantribes.com email is no longer being monitored. Referrals should be directed to Candace Charlie (candace.charlie@cowichantribes.com) and Natalie Anderson (natalie.anderson@cowichantribes.com).	N/A	N/A	Pre-application
15-Apr-20	Stó:lō Nation	Stó:lō Connect	N/A	Celine Lee, Hemmera	Confirmed that referral has been deferred to Musqueam Indian Band (MIB), Squamish Nation (SN), and Tsleil-Waututh Nation (TWN). Contact person for the file: Barry Schmitz (bschmitz@peopleoftheriver.com).	N/A	N/A	Pre-application
16-Apr-20	Halalt First Nation	Email	Raven August, HFN	Celine Lee, Hemmera	HFN confirmed receipt of letter.	N/A	N/A	Pre-application
17-Apr-20	Squamish Nation	Phone	Celine Lee, Hemmera	Receptionist, SN	Called to confirm receipt of project introduction letter. Was told to email Denise Jensen (denise_jensen@squamish.net).	N/A	N/A	Pre-application
17-Apr-20	Musqueam Indian Band	Phone	Celine Lee, Hemmera	MIB	Called to confirm receipt of project introduction letter. Was told to email Erin Sweeney, Title and Rights EA (esweeney@musqueam.bc.ca). Debbie Miller and Katherine Wheatley no longer work for MIB.	N/A	N/A	Pre-application

## Engagement Log

Date	Indigenous Community	Method	Sender/Attendee	Recipient	Description	Attachment(s)	Current Actions	Project Phase
17-Apr-20	Kwkwetlem First Nation	Meeting	Attendees: Robert Corman, KFN Graham Gilles, KFN Nicole Oakes, Brown and Oakes Mike LoVecchio, CP Joe Van Humbeck, CP Janelle McLaren, CP Morgan Tanner, Hemmera	N/A	CP provided an overview of several CP projects, including Viterra-Cascadia Expansion Project (Cascadia Phase 4). Kwkwetlem First Nation (KFN) requested to be involved in archaeological work and to review environmental studies for Cascadia Phase 4.	N/A	N/A	Pre-application
22-Apr-20	Tsleil-Waututh Nation	Phone	Celine Lee, Hemmera	No answer	No voicemail available.	N/A	N/A	Pre-application
22-Apr-20	Cowichan Tribes	Phone	Celine Lee, Hemmera	No answer	Left voicemail to confirm receipt of letter.	N/A	N/A	Pre-application
22-Apr-20	Lake Cowichan First Nation	Phone	Celine Lee, Hemmera	Receptionist, LCFN	Left message with receptionist for Carole Livingstone (referrals dept.) to confirm receipt of letter.	N/A	N/A	Pre-application
22-Apr-20	Lyackson First Nation	Phone	Celine Lee, Hemmera	Office Manager, LFN	Hemmera called to confirm receipt of letter. Was told to email reception@lyackson.bc.ca.	N/A	N/A	Pre-application
22-Apr-20	Penelakut Tribe	Phone	Celine Lee, Hemmera	Denise J., PT	Called to confirm receipt of letter. Was told to email denisej@penelakut.ca. Penelakut Tribe (PT) is currently short-staffed because of COVID-19 but will review the referral as soon as possible.	N/A	N/A	Pre-application
22-Apr-20	Seabird Island Band	Phone	Celine Lee, Hemmera	Receptionist, SIB	Called to confirm receipt of letter. Was told to email Danielle Gabriel, Seabird Island Band (SIB) Lands Manager.	N/A	N/A	Pre-application
22-Apr-20	Stz'uminus First Nation	Phone	Celine Lee, Hemmera	Receptionist, SFN	Left message with receptionist for Ronda Jordan to confirm receipt of letter.	N/A	N/A	Pre-application
23-Apr-20	Musqueam Indian Band	Email	Celine Lee, Hemmera	Erin Sweeney, MIB	Forwarded project materials to Erin.	Letter, Project Location KMZ	N/A	Pre-application
23-Apr-20	Lyackson First Nation	Email	Celine Lee, Hemmera	Reception, LFN	Forwarded project materials to reception@lyackson.bc.ca.	Letter, Project Location KMZ	N/A	Pre-application
23-Apr-20	Penelakut Tribe	Email	Celine Lee, Hemmera	Denise J., PT	Forwarded project materials to Denise J.	Letter, Project Location KMZ	N/A	Pre-application
24-Apr-20	Squamish Nation	Email	Celine Lee, Hemmera	Denise Jensen, SN	Forwarded project materials to Denise Jensen.	Letter, Project Location KMZ	N/A	Pre-application
24-Apr-20	Seabird Island Band	Email	Celine Lee, Hemmera	Danielle Gabriel, SIB	Forwarded project materials to Danielle Gabriel.	Letter, Project Location KMZ	N/A	Pre-application
30-Apr-20	Musqueam Indian Band	Email	Morgan Tanner, Hemmera cc: Joe Van Humbeck, CP Mike LoVecchio, CP	Erin Sweeney, MIB	Follow-up email to the letter sent on April 9, 2020.	N/A	N/A	Pre-application
30-Apr-20	Musqueam Indian Band	Email	Erin Sweeney, MIB cc: Larissa Grant, MIB Jason Woolman, MIB Erin Larocque, MIB Christopher Raftis, MIB Aviva Rathbone, MIB Yeganeh Asadian, MIB	Morgan Tanner, Hemmera cc: Joe Van Humbeck, CP Mike LoVecchio, CP	Erin asked Morgan to send to the April 9, 2020 letter referred to in her previous email and said she did not have record of it.	N/A	N/A	Pre-application
30-Apr-20	Musqueam Indian Band	Email	Morgan Tanner, Hemmera	Erin Sweeney, MIB	Re-sent project introduction letter to Erin.	Letter	N/A	Pre-application
7-May-20	Kwkwetlem First Nation	Email	Robert Corman, KFN cc: Craig Orr, KFN Nicole Oakes, KFN Joe Van Humbeck, CP Kiley Gibson, CP Morgan Tanner, Hemmera Joshua Jodoin, Hemmera	Celine Lee, Hemmera	Hemmera sent the Cascadia Phase 4 workplans to KFN for review and comment.	Workplan Document	N/A	Pre-application
7-May-20	Tsleil-Waututh Nation	Email	Chantal Kitamura, TWN cc: Ernie George, TWN	Celine Lee, Hemmera	Hemmera sent the Cascadia Phase 4 workplans to TWN for review and comment.	Workplan Document	N/A	Pre-application
7-May-20	Tsleil-Waututh Nation	Email	Cheryl Perich, TWN	Celine Lee, Hemmera	Requested contact information for new TWN consultation manager, as Chantal's email was no longer active.	N/A	N/A	Pre-application
7-May-20	Tsleil-Waututh Nation	Email	Celine Lee, Hemmera	Jessica Steele, TWN	Cheryl shared that Chantal is no longer working with TWN and said she would forward the workplan email to Jessica Steele (Senior Referrals Analyst) and Melanie Walker (Consultation and Accommodation Manager).	N/A	N/A	Pre-application
7-May-20	Tsleil-Waututh Nation	Email	Celine Lee, Hemmera	Jessica Steele, TWN	Sent project introduction letter and kmz to Jessica to ensure she had all project materials.	Letter, Project Location KMZ	N/A	Pre-application
8-May-20	Tsleil-Waututh Nation	Email	Jessica Steele, TWN	Celine Lee, Hemmera	Jessica provided contact information for the TWN referrals team (referrals@twnation.ca). Jessica is part of the EA-specific referrals team.	N/A	N/A	Pre-application
15-May-20	Kwkwetlem First Nation	Email	Celine Lee, Hemmera Robert Corman, KFN cc: Nicole Oakes, KFN Joe Van Humbeck, CP Kiley Gibson, CP Joshua Jodoin, Hemmera Morgan Tanner, Hemmera	Craig Orr, KFN	Craig confirmed receipt of workplans and provided Sarah's email (referrals@kwkwetlem.com).	N/A	N/A	Pre-application



## Engagement Log

Date	Indigenous Community	Method	Sender/Attendee	Recipient	Description	Attachment(s)	Current Actions	Project Phase
19-May-20	Musqueam Indian Band	Email	Morgan Tanner, Hemmera	Erin Sweeney, MIB	Morgan followed up with Erin to see if MIB had any questions regarding CP projects, including Cascadia Phase 4.	N/A	N/A	Pre-application
21-May-20	Musqueam Indian Band	Email	Erin Larocque, MIB	Morgan Tanner, Hemmera Celine Lee, Hemmera	Confirmed that MIB does not have questions about Cascadia Phase 4 at this time and has been in touch with arch consultants. Shared that she will ask the Fisheries Department if there is interest in participating in offsetting. Requested KMZ file.	N/A	N/A	Pre-application
21-May-20	Tsleil-Waututh Nation	Phone	Celine Lee, Hemmera	Dorothy, TWN	Celine called to confirm receipt of letter. Was told to email Michelle George (michellegeorge@twnation.ca) and Cora denHartigh (cdenhartigh@twnation.ca).	N/A	N/A	Pre-application
21-May-20	Tsleil-Waututh Nation	Email	Celine Lee, Hemmera	Michelle George, TWN Cora denHartigh, TWN cc: Melanie Walker, TWN	Celine forwarded project materials to Michelle and Cora and requested any TWN-specific materials regarding offsetting priorities.	N/A	N/A	Pre-application
21-May-20	Squamish Nation	Email	Denise Jensen, SN	Ewan Anderson, Terra Archaeology cc: Robyn Ewing, Aspect Heritage Consulting Chrystal Nahanee, SN	Denise sent correspondence from SN regarding SN Archaeological Permit - #20-0125 - Ewan Anderson - Teraa - AIA Cascadia Expansion Phase 4 Project.	SN Correspondence - Archaeological Permit	N/A	Pre-application
21-May-20	Squamish Nation	Email	Terra Archaeology	Denise Jensen, SN cc: Robin Ewing, Aspect Heritage Consulting Chrystal Nahanee, SN	Terra Archaeology thanked Denise for sending the SN Archaeological Permit #20-0125.	N/A	N/A	Pre-application
29-May-20	Musqueam Indian Band	Email	Morgan Tanner, Hemmera	Erin LaRocque, MIB Kayla Phillips, MIB	Sent project KMZ file.	Project Location KMZ	N/A	Pre-application
1-Jun-20	Musqueam Indian Band	Email	Morgan Tanner, Hemmera	Erin LaRocque, MIB cc: Kayla Phillips, MIB Joe Van Humbeck, CP Celine Lee, Hemmera	Morgan shared that planning for offsetting would begin this summer and that Hemmera would reach out accordingly.	N/A	N/A	Pre-application
1-Jun-20	Musqueam Indian Band	Email	Erin Larocque, MIB	Morgan Tanner, Hemmera cc: Kayla Phillips, MIB Joe Van Humbeck, CP Celine Lee, Hemmera	Erin confirmed receipt of KMZ file and reiterated request for Offsetting Plans to be shared when available.	N/A	1. Hemmera/CP to share draft Offsetting Plan with Erin when available.	Pre-application
3-Jun-20	Squamish Nation	Phone	Celine Lee, Hemmera	No answer	N/A	N/A	N/A	Pre-application
3-Jun-20	Tsleil-Waututh Nation	Phone	Celine Lee, Hemmera	No answer	N/A	N/A	N/A	Pre-application

## Engagement Log

Date	Indigenous Community	Method	Sender/Attendee	Recipient	Description	Attachment(s)	Current Actions	Project Phase
3-Jun-20	Squamish Nation	Email	Celine Lee, Hemmera	Denise Jensen, SN	Sent follow-up email to see if the referrals team has any questions/comments on the project materials.	N/A	N/A	Pre-application
3-Jun-20	Squamish Nation	Email	Denise Jensen, SN	Celine Lee, Hemmera	Denise confirmed that the SN team is still reviewing the project materials.	N/A	N/A	Pre-application
3-Jun-20	Tsleil-Waututh Nation	Email	Celine Lee, Hemmera	Michelle George, TWN Cora denHartigh, TWN cc: Melanie Walker, TWN	Sent follow-up email to see if the referrals team has any questions/concerns on the project materials.	N/A	N/A	Pre-application
5-Jun-20	Tsleil-Waututh Nation	Phone	Celine Lee, Hemmera	Michelle George, TWN	Left voicemail to confirm receipt of letter.	N/A	N/A	Pre-application
5-Jun-20	Cowichan Tribes	Phone	Celine Lee, Hemmera	No answer	Automated message stated that Cowichan Tribes (CT) is closed due to COVID-19 restrictions and currently only operating essential services.	N/A	N/A	Pre-application
5-Jun-20	Halalt First Nation	Email	Celine Lee, Hemmera	Raven August, HFN	Hemmera sent follow-up email to see if the referrals team had any questions/concerns about Cascadia Phase 4.	N/A	N/A	Pre-application
10-Jun-20	Kwikwetlem First Nation	Email	Craig Orr, KFN	Celine Lee, Hemmera Robert Corman, KFN cc: Nicole Oakes, KFN Joe Van Humbeck, CP Kiley Gibson, CP Joshua Jodoin, Hemmera Morgan Tanner, Hemmera	Craig re-confirmed receipt of workplans (initial confirmation provided on May 15, 2020). Confirmed that workplans were forwarded to Sarah in the referrals department (sarah@kwikwetlem.com). Commented that he would be interested in seeing some of the work.	N/A	N/A	Pre-application
10-Jun-20	Kwikwetlem First Nation	Email	Celine Lee, Hemmera	Craig Orr, KFN cc: Nicole Oakes, KFN Joe Van Humbeck, CP Kiley Gibson, CP Joshua Jodoin, Hemmera	Celine asked Craig which parts of the work he would be interested in seeing.	N/A	N/A	Pre-application
11-Jun-20	Kwikwetlem First Nation	Email	Craig Orr, KFN	Celine Lee, Hemmera cc: Nicole Oakes, KFN Joe Van Humbeck, CP Kiley Gibson, CP Joshua Jodoin, Hemmera	Craig responded that he would be interested in seeing some of the marine mapping and assessment work (ground sampling).	N/A	N/A	Pre-application
11-Jun-20	Kwikwetlem First Nation	Email	Josh Jodoin, Hemmera	Craig Orr, KFN Celine Lee, Hemmera cc: Nicole Oakes, KFN Joe Van Humbeck, CP Kiley Gibson, CP	Joshua indicated that some of the work would be starting the following week and asked if this would work for Craig's timeline.	N/A	N/A	Pre-application
11-Jun-20	Kwikwetlem First Nation	Email	Craig Orr, KFN	Joshua Jodoin, Hemmera Celine Lee, Hemmera cc: Nicole Oakes, KFN Joe Van Humbeck, CP Kiley Gibson, CP	Craig confirmed his availability on Tuesday and Wednesday the following week.	N/A	N/A	Pre-application
11-Jun-20	Kwikwetlem First Nation	Email	Josh Jodoin, Hemmera	Craig Orr, KFN Celine Lee, Hemmera cc: Nicole Oakes, KFN Joe Van Humbeck, CP Kiley Gibson, CP	Joshua shared that some of the assessment would be completed on Monday and some would be completed the following weekend (June 19, 2020 - June 21, 2020).	N/A	N/A	Pre-application
11-Jun-20	Tsleil-Waututh Nation	Phone	Celine Lee, Hemmera	TWN Receptionist	Celine asked the TWN receptionist if cell phone numbers were available for referrals staff, as they were not working from the office and had not yet responded to emails about the Project. The TWN receptionist could not provide cell phone numbers but did relay the message to Jessica in the referrals department. The TWN receptionist said that Jessica would phone Celine directly to follow up.	N/A	N/A	Pre-application
12-Jun-20	Kwikwetlem First Nation	Email	Craig Orr, KFN	Joshua Jodoin, Hemmera Celine Lee, Hemmera cc: Nicole Oakes, KFN Joe Van Humbeck, CP Kiley Gibson, CP	Craig shared he was not available on those dates and that hopefully there would be future opportunities.	N/A	N/A	Pre-application
15-Jun-20	Kwikwetlem First Nation	Email	Josh Jodoin, Hemmera	Craig Orr, KFN Celine Lee, Hemmera cc: Nicole Oakes, KFN Joe Van Humbeck, CP Kiley Gibson, CP Scott Toews, Hemmera Joe Walker, Hemmera	Joshua shared that some of the fieldwork was moved to Friday.	N/A	N/A	Pre-application

## Engagement Log

Date	Indigenous Community	Method	Sender/Attendee	Recipient	Description	Attachment(s)	Current Actions	Project Phase
15-Jun-20	Kwkwetlem First Nation	Email	Craig Orr, KFN	Joshua Jodoin, Hemmera Celine Lee, Hemmera cc: Nicole Oakes, KFN Joe Van Humbeck, CP Kiley Gibson, CP Scott Toews, Hemmera Joe Walker, Hemmera	Craig confirmed that he would be away on Friday, as well.	N/A	N/A	Pre-application
22-Jun-20	Kwkwetlem First Nation	Email	Terra Archaeology	KFN representative	Terra Archaeology sent a summary of the archaeological survey to KFN.	N/A	N/A	Pre-application
22-Jun-20	Musqueam Indian Band	Email	Terra Archaeology	MIB	Terra Archaeology sent a summary of the archaeological survey to MIB.	N/A	N/A	Pre-application
22-Jun-20	Tsleil-Waututh Nation	Email	Terra Archaeology	TWN Representative	Terra Archaeology sent a summary of the archaeological survey completed that day to TWN.	N/A	N/A	Pre-application
22-Jun-20	Squamish Nation	Monitoring	Cyrus Baker-Balis, Ecologic Consultants	N/A	Cyrus participated in fieldwork with Terra Archaeology. He did not share any concerns about the Project.	N/A	N/A	Pre-application
22-Jun-20	Musqueam Indian Band	Email	MIB	Terra Archaeology	MIB archaeologist confirmed receipt of archaeological survey summary.	N/A	N/A	Pre-application
25-Jun-20	Halalt First Nation	Email	Eliza Bethune, Hemmera	Referrals, HFN Morgan Tanner, Hemmera	Eliza initially acknowledged that it had been some time since the last communications regarding Cascadia Phase 4. Subsequently, Eliza commented that Hemmera wanted to confirm that CP had submitted a Category C PER Application to the Vancouver Fraser the Port and a Fisheries Act Application to Fisheries and Oceans Canada. Eliza reported that CP submitted these applications on June 4 and that both applications were in the review process.  Eliza also mentioned that by the time the review process was completed, CP anticipated that both DFO and the Port would begin consultations. Eliza also offered her support if the HFN's team needed anything from CP or if they wanted to set up a meeting, share information or clarify any questions they may have regarding Cascadia Phase 4.	N/A	N/A	Pre-application
3-Jul-20	Cowichan Tribes	Phone	Celine Lee, Hemmera	No answer	Automated message still in place stating that Cowichan Tribes is closed due to COVID-19 restrictions.	N/A	N/A	Pre-application
3-Jul-20	Halalt First Nation	Email	Celine Lee, Hemmera	Raven August, HFN cc: Joe Van Humbeck, CP Kiley Gibson, CP	Hemmera sent a follow-up email to see if the referrals team had any questions/concerns about Cascadia Phase 4.	N/A	N/A	Pre-application
3-Jul-20	Lake Cowichan First Nation	Email	Celine Lee, Hemmera	Carole Livingstone, LCFN cc: Joe Van Humbeck, CP Kiley Gibson, CP	Sent follow-up email to see if the referrals team has any questions/concerns about the Cascadia Phase 4.	N/A	N/A	Pre-application
3-Jul-20	Lyackson First Nation	Email	Celine Lee, Hemmera	Reception, LFN cc: Joe Van Humbeck, CP Kiley Gibson, CP	Hemmera sent a follow-up email to see if the referrals team has any questions/concerns about Cascadia Phase 4.	N/A	N/A	Pre-application
3-Jul-20	Penelakut Tribe	Email	Celine Lee, Hemmera	Denise J., PT cc: Joe Van Humbeck, CP Kiley Gibson, CP	Sent follow-up email to see if the referrals team has any questions/concerns about Cascadia Phase 4.	Letter, Project Location KMZ	N/A	Pre-application
3-Jul-20	Seabird Island Band	Email	Celine Lee, Hemmera	Danielle Gabriel, SIB cc: Joe Van Humbeck, CP Kiley Gibson, CP	Sent follow-up email to see if the referrals team has any questions/concerns about Cascadia Phase 4.	N/A	N/A	Pre-application
3-Jul-20	Squamish Nation	Email	Celine Lee, Hemmera	Denise Jensen, SN cc: Joe Van Humbeck, CP Kiley Gibson, CP	Sent follow-up email to see if the referrals team has any questions/concerns about Cascadia Phase 4.	N/A	N/A	Pre-application
3-Jul-20	St'uminus First Nation	Email	Celine Lee, Hemmera	Ronda Jordan, SFN cc: Joe Van Humbeck, CP Kiley Gibson, CP	Sent follow-up email to see if the referrals team has any questions/concerns about Cascadia Phase 4.	N/A	N/A	Pre-application
3-Jul-20	Tsleil-Waututh Nation	Email	Celine Lee, Hemmera	Melanie Walker, TWN cc: Michelle George, TWN Cora denHartigh, TWN Jessica Steele, TWN	Sent follow-up email to see if the referrals team has any questions/concerns about Cascadia Phase 4.	N/A	N/A	Pre-application
3-Jul-20	Tsleil-Waututh Nation	Email	Cora denHartigh, TWN	Celine Lee, Hemmera cc: Melanie Walker, TWN	Cora responded that "this project is of high concern to the Nation, however, these project documents are still undergoing review." She also requested that future correspondence be directed to the referrals email (referrals@twnation.ca).	N/A	N/A	Pre-application



## Engagement Log

Date	Indigenous Community	Method	Sender/Attendee	Recipient	Description	Attachment(s)	Current Actions	Project Phase
3-Jul-20	Tsleil-Waututh Nation	Email	Celine Lee, Hemmera	Cora denHartigh, TWN cc: Melanie Walker, TWN	Celine responded that she noted the project was of high concern to the TWN and that she looked forward to TWN's review. She confirmed that future correspondence would be sent to the referrals email.	N/A	N/A	Pre-application
9-Jul-20	Halalt First Nation	Email	Raven August, HFN	Celine Lee, Hemmera	Halalt First Nation (HFN) responded that there are no outstanding questions or concerns, at this time.	N/A	N/A	Pre-application
13-Jul-20	Tsleil-Waututh Nation	Email	Terra Archaeology	Cheryl Perich, TWN	Terra Archaeology informed TWN that they had closer look at the lithics collected from the Cascadia Phase 4 area, one of which is cultural (a fine-grained volcanic, platform remnant bearing flake) – the others are non-cultural. Terra Archaeology is developing an archaeological management plan for this site once information is received from the geotechnical testing. Although no geotechnical tests have been or will be placed in the vicinity of the site, Terra Archaeology hopes information from these tests will allow them to make an informed recommendation for how to proceed and confirmed sharing this recommendation with TWN before finalizing plans for any additional work.	N/A	N/A	Pre-application
13-Jul-20	Squamish Nation	Email	Terra Archaeology	Denise Jensen, SN cc: Louise Williams, SN Robyn Ewing, Aspect Heritage Consulting Kim Meyer, Terra Archaeology	Description of archeological survey completed at Burrard Inlet in Burnaby, and the finding of an artifact. Terra Archaeology said an archeological management plan would be developed for the site once information from the geotechnical testing was received.	Photo of artifact embedded in email	N/A	Pre-application
13-Jul-20	Kwikwetlem First Nation	Email	Terra Archaeology	Nicole Oakes, KFN	Terra Archaeology said Nick had a closer look at the lithics collected from the Cascadia Phase 4 area. One of which is cultural (a fine-grained volcanic, platform remnant bearing flake) – the others are non-cultural. Terra Archaeology informed Nicole that they were developing an archaeological management plan for this site once information from the geotechnical testing is received. Although no geotechnical tests have been or will be placed in the vicinity of the site, it is hoped that information from these tests will allow Terra Archaeology to make a recommendation for how to proceed and confirmed discussing this recommendation with KFN before finalizing plans for any additional work.	N/A	N/A	Pre-application
17-Jul-20	Tsleil-Waututh Nation	Email	Lauren Bell, TWN	Celine Lee, Hemmera cc: Melanie Walker, TWN	Laura notified Celine that rocks on the shore along the west side of Capitol Hill have been causing disturbance to the water currents in Burrard Inlet and asked Celine to confirm if this change in turbidity is related to work being undertaken by CP or whether it was present before the proposed construction work. Laura had a few follow-up questions related to this and asked that Celine get back to her so she can update the community and address their concerns. She also addresses TWN's consultation preferences around ecological studies in Burrard Inlet.	N/A	N/A	Pre-application
17-Jul-20	Tsleil-Waututh Nation	Email	Celine Lee, Hemmera	Lauren Bell, TWN cc: Melanie Walker, TWN	Celine thanked Lauren for her email and let her know that she was confirming information and would send a more detailed response as soon as possible.	N/A	N/A	Pre-application
17-Jul-20	Tsleil-Waututh Nation	Email	Lauren Bell, TWN	Celine Lee, Hemmera cc: Melanie Walker, TWN	Lauren provided a preliminary review of the project (see Issues and Concerns tab).	Image and map of Burrard Inlet turbidity source	N/A	Pre-application
22-Jul-20	Tsleil-Waututh Nation	Email	Celine Lee, Hemmera	Lauren Bell, TWN cc: Melanie Walker, TWN	Celine confirmed receipt of Lauren's email and indicated that she would provide a more detailed response asap.	N/A	N/A	Pre-application
27-Jul-20	Halalt First Nation	Email	Celine Lee, Hemmera	Raven August, HFN	Hemmera thanked HFN for the reply.	N/A	N/A	Pre-application
27-Jul-20	Tsleil-Waututh Nation	Email	Celine Lee, Hemmera	Lauren Bell, TWN cc: Melanie Walker, TWN Joe Van Humbeck, CP Kiley Gibson, CP Joshua Jodoin, Hemmera	Celine provided a more detailed response to Lauren regarding rocks near Capitol Hill and offsetting, including requesting a virtual Offsetting Workshop in August.	N/A	N/A	Pre-application
27-Jul-20	Musqueam Indian Band	Email	Celine Lee, Hemmera	Erin Larocque, MIB cc: Joe Van Humbeck, CP Kiley Gibson, CP Joshua Jodoin, Hemmera Morgan Tanner, Hemmera	Celine shared that the team is currently considering offsetting options and proposed coordinating a virtual Offsetting Workshop in August.	N/A	N/A	Pre-application
27-Jul-20	Squamish Nation	Email	Celine Lee, Hemmera	Denise Jensen, SN cc: Joe Van Humbeck, CP Kiley Gibson, CP Joshua Jodoin, Hemmera	Celine shared that the team is currently considering offsetting options and proposed coordinating a virtual Offsetting Workshop in August 2020.	N/A	N/A	Pre-application

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Date	Indigenous Community	Method	Sender/Attendee	Recipient	Description	Attachment(s)	Current Actions	Project Phase
27-Jul-20	Squamish Nation	Email	Denise Jensen, SN	Celine Lee, Hemmera cc: Joe Van Humbeck, CP Kiley Gibson, CP Joshua Jodoin, Hemmera	Denise responded that she would forward the email to her team.	N/A	N/A	Pre-application
27-Jul-20	Kwikwetlem First Nation	Email	Celine Lee, Hemmera	Craig Orr, KFN cc: Robert Corman, KFN Sarah Prien, KFN Joe Van Humbeck, CP Kiley Gibson, CP Joshua Jodoin, Hemmera	Celine shared that the CP/Hemmera team is currently considering offsetting options and proposed coordinating a virtual Offsetting Workshop in August.	N/A	N/A	Pre-application
27-Jul-20	Kwikwetlem First Nation	Email	Craig Orr, KFN	Celine Lee, Hemmera	Craig responded that a meeting on August 10, 2020 - August 12, 2020 would work for him.	N/A	N/A	Pre-application
27-Jul-20	Kwikwetlem First Nation	Email	Celine Lee, Hemmera	Craig Orr, KFN	Celine asked which times would work best for Craig.	N/A	N/A	Pre-application
27-Jul-20	Kwikwetlem First Nation	Email	Craig Orr, KFN	Celine Lee, Hemmera	Craig suggested meeting on August 11, 2020 at 10 am.	N/A	N/A	Pre-application
29-Jul-20	Kwikwetlem First Nation	Email	Celine Lee, Hemmera	Craig Orr, KFN	Celine proposed August 11, 2020 at 11:00 am instead of 10:00 am.	N/A	N/A	Pre-application
29-Jul-20	Kwikwetlem First Nation	Email	Craig Orr, KFN	Celine Lee, Hemmera	Craig confirmed that date would work for him.	N/A	N/A	Pre-application
29-Jul-20	Kwikwetlem First Nation	Email	Celine Lee, Hemmera	Craig Orr, KFN	Celine asked if she should include Robert Corman and Sarah in the invitation.	N/A	N/A	Pre-application
29-Jul-20	Kwikwetlem First Nation	Email	Craig Orr, KFN	Celine Lee, Hemmera	Robert confirmed that Celine should include Robert Corman and Sarah.	N/A	N/A	Pre-application
4-Aug-20	Tsleil-Waututh Nation	Email	Celine Lee, Hemmera	Lauren Bell, TWN cc: Melanie Walker, TWN Kate Menzies, TWN	Celine confirmed sharing the TWN fee schedule and requested that Lauren resend the cost-estimate dated November 4, 2019. Celine also provided further details about the Offsetting Workshop.	N/A	N/A	Pre-application
4-Aug-20	Kwikwetlem First Nation	Email	Celine Lee, Hemmera	Craig Orr, KFN Robert Corman, KFN Sarah, KFN	Celine sent official invitation for offsetting workshop on August 11, 2020 at 11:00 am.	N/A	N/A	Pre-application
4-Aug-20	Musqueam Indian Band	Phone	Celine Lee, Hemmera	Erin Larocque, MIB	Celine phoned to ask about interest in offsetting workshop (no answer).	N/A	N/A	Pre-application
4-Aug-20	Musqueam Indian Band	Email	Celine Lee, Hemmera	Erin Larocque, MIB	Celine sent a follow-up email to Erin regarding organizing an offsetting workshop for the beginning of August.	N/A	N/A	Pre-application
4-Aug-20	Tsleil-Waututh Nation	Email	Celine Lee, Hemmera	Lauren Bell, TWN	Celine sent a follow-up email to Lauren regarding organizing an offsetting workshop for the beginning of August.	N/A	N/A	Pre-application
4-Aug-20	Tsleil-Waututh Nation	Email	Lauren Bell, TWN	Celine Lee, Hemmera cc: Melanie Walker, TWN Kate Menzies, TWN	Lauren thanked Celine for her reassurance regarding the rocks near Capitol Hill and discussed details around Capacity Funding Agreements.	N/A	N/A	Pre-application
5-Aug-20	Musqueam Indian Band	Email	Erin Larocque, MIB	Celine Lee, Hemmera	Erin confirmed that MIB would be interested in reviewing the draft Offsetting Plan and confirmed getting back to Celine about the offsetting workshop.	N/A	N/A	Pre-application
5-Aug-20	Tsleil-Waututh Nation	Email	Lauren Bell, TWN	Celine Lee, Hemmera cc: Melanie Walker, TWN Kate Menzies, TWN	Details around Capacity Funding Agreements were discussed.	N/A	N/A	Pre-application
5-Aug-20	Tsleil-Waututh Nation	Email	Celine Lee, Hemmera	Lauren Bell, TWN cc: Melanie Walker, TWN Kate Menzies, TWN	Details around Capacity Funding Agreements were discussed.	N/A	N/A	Pre-application
5-Aug-20	Tsleil-Waututh Nation	Email	Melanie Walker, TWN	Celine Lee, Hemmera, Lauren Bell TWN cc: Kate Menzies, TWN	Details around Capacity Funding Agreements were discussed.	N/A	N/A	Pre-application
5-Aug-20	Tsleil-Waututh Nation	Email	Celine Lee, Hemmera	Melanie Walker, TWN cc: Lauren Bell, TWN Kate Menzies, TWN	Details around Capacity Funding Agreements were discussed.	N/A	N/A	Pre-application
5-Aug-20	Tsleil-Waututh Nation	Email	Melanie Walker, TWN	Celine Lee, Hemmera cc: Lauren Bell, TWN Kate Menzies, TWN	Melanie thanked Celine.	N/A	N/A	Pre-application
6-Aug-20	Kwikwetlem First Nation	Email	Annie Coetzee, KFN	Celine Lee, Hemmera	Annie confirmed that she will be away on vacation.	N/A	N/A	Pre-application
6-Aug-20	Kwikwetlem First Nation	Email	Celine Lee, Hemmera	Robert Corman, KFN cc: Craig Orr, KFN Annie Coetzee, KFN	Celine asked Robert if it was okay to move forward with the workshop with just Craig and Sarah in attendance.	N/A	N/A	Pre-application
6-Aug-20	Kwikwetlem First Nation	Email	Sarah Prien, KFN	Celine Lee, Hemmera cc: Craig Orr, KFN Annie Coetzee, KFN Robert Corman, KFN	Sarah asked if there was an agenda to review.	N/A	N/A	Pre-application
6-Aug-20	Kwikwetlem First Nation	Email	Celine Lee, Hemmera	Sarah Prien, KFN cc: Craig Orr, KFN Annie Coetzee, KFN Robert Corman, KFN	Celine provided a tentative agenda for their upcoming meeting.	N/A	N/A	Pre-application

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Date	Indigenous Community	Method	Sender/Attendee	Recipient	Description	Attachment(s)	Current Actions	Project Phase
6-Aug-20	Kwikwetlem First Nation	Email	Sarah Prien, KFN	Celine Lee, Hemmera Matt Henderson, Ecologic Consultants cc: Craig Orr, KFN Annie Coetzee, KFN Robert Corman, KFN	Sarah thanked Celine for the tentative agenda and introduced Matt Henderson. She explained that KFN would only be able to meet without Robert if Matt was available to attend.	N/A	N/A	Pre-application
6-Aug-20	Kwikwetlem First Nation	Email	Celine Lee, Hemmera	Sarah Prien, KFN Matt Henderson, Ecologic Consultants cc: Craig Orr, KFN Annie Coetzee, KFN Robert Corman, KFN	Celine thanked Sarah for the update and said she would forward the meeting invitation.	N/A	N/A	Pre-application
6-Aug-20	Kwikwetlem First Nation	Email	Matt Henderson, Ecologic Consultants	Celine Lee, Hemmera cc: Sarah, KFN Craig Orr, KFN Annie Coetzee, KFN Robert Corman, KFN	Matt confirmed his attendance to the upcoming meeting.	N/A	N/A	Pre-application
6-Aug-20	Kwikwetlem First Nation	Email	Celine Lee, Hemmera	Robert Corman, KFN cc: Craig Orr, KFN Annie Coetzee, KFN Sarah, KFN	Robert confirmed that the workshop should move forward without him. He also added that Matt would be present for the meeting.	N/A	N/A	Pre-application
7-Aug-20	Tsleil-Waututh Nation	Email	Celine Lee, Hemmera	Melanie Walker, TWN, Lauren Bell, TWN cc: Kate Menzies, TWN Joe Van Humbeck, CP Kiley Gibson, CP	Celine confirmed that her team was available to meet TWN on Tuesday August 11, 2020 at 3:00 pm for the Offsetting Workshop. Details around Capacity Funding Agreements were discussed.	N/A	N/A	Pre-application
7-Aug-20	Tsleil-Waututh Nation	Email	Melanie Walker, TWN	Celine Lee, Hemmera Lauren Bell, TWN cc: Kate Menzies, TWN Joe Van Humbeck, CP Kiley Gibson, CP	Details around Capacity Funding Agreements were discussed.	N/A	N/A	Pre-application
7-Aug-20	Tsleil-Waututh Nation	Email	Lauren Bell, TWN	Joe Van Humbeck, CP cc: Melanie Walker, TWN Kate Menzies, TWN Celine Lee, Hemmera	Details around Capacity Funding Agreements were discussed.	N/A	N/A	Pre-application
7-Aug-20	Tsleil-Waututh Nation	Email	Celine Lee, Hemmera	Melanie Walker, TWN cc: Lauren Bell, TWN Kate Menzies, TWN Joe Van Humbeck, CP Kiley Gibson, CP	Celine said she was looking forward to meeting and working with Melanie and her team. In the future, Celine will liaise with Lauren and Kate for Cascadia Phase 4.	N/A	N/A	Pre-application
7-Aug-20	Tsleil-Waututh Nation	Email	Lauren Bell, TWN	Celine Lee, Hemmera Melanie Walker, TWN cc: Kate Menzies, TWN Joe Van Humbeck, CP Kiley Gibson, CP	Details around Capacity Funding Agreements were discussed.	N/A	N/A	Pre-application
7-Aug-20	Musqueam Indian Band	Email	Celine Lee, Hemmera	Erin Larocque, MIB	Celine let Erin know that she would send a draft Offsetting Plan to MIB when it's ready for review. Celine asked if Erin's team was available to meet next Wednesday or Thursday for the Offsetting Workshop.	N/A	1. Hemera/CP to send MIB the draft Offsetting Plan	Pre-application
11-Aug-20	Tsleil-Waututh Nation	Meeting	Brittany John, TWN Kate Menzies, TWN Lauren Bell, TWN Lindsey Ogston, TWN Kiley Gibson, CP Celine Lee, Hemmera Jim Roberts, Hemmera Joshua Jodoin, Hemmera Trevor Welton, Hemmera	N/A	CP/Hemmera met with TWN to: -Provide a Cascadia Phase 4 update -Describe anticipated fish habitat effects -Review preliminary offsetting opportunities -Discuss offsetting opportunities of interest to TWN -Discuss the outcome (i.e. integration of feedback)	N/A	1. Hemmera/CP to share draft Biophysical Assessment with TWN 2. Hemmera/CP to share draft PER application with TWN	Pre-application
11-Aug-20	Kwikwetlem First Nation	Meeting	Craig Orr, KFN Sarah Prien, KFN Matt Henderson, Ecologic Consultants Joe Van Humbeck, CP Kiley Gibson, CP Celine Lee, Hemmera Jim Roberts, Hemmera Joshua Jodoin, Hemmera Trevor Welton, Hemmera	N/A	CP/Hemmera met with KFN to: -Provide a Cascadia Phase 4 update -Describe anticipated fish habitat effects -Review preliminary offsetting opportunities -Discuss offsetting opportunities of interest to KFN -Discuss the outcome (i.e. integration of feedback)	N/A	1. Hemmera/CP to share draft Biophysical Assessment with KFN 2. Hemmera/CP to share draft PER application with KFN	Pre-application



## Engagement Log

Date	Indigenous Community	Method	Sender/Attendee	Recipient	Description	Attachment(s)	Current Actions	Project Phase
12-Aug-20	Tsleil-Waututh Nation	Email	Terra Archaeology	Cheryl Perich, TWN	Terra Archaeology informed TWN that they would be doing follow-up subsurface testing around the location of the isolated find identified by the field crew on June 22, 2020 and asked if there was someone from TWN available for remote monitoring (or to join in the field). Terra Archaeology explained the purpose of the additional work and attached the site map submitted to the Archaeology Branch (Arch Branch).	Site map submitted to the Arch Branch	N/A	Pre-application
12-Aug-20	Kwikwetlem First Nation	Email	Terra Archaeology	Nicole Oakes, KFN	Terra Archaeology let Nicole know that they plan on completing some follow-up subsurface testing around the location of the isolated find identified by the field crew on June 22 and asked if someone from KFN would like to join this work. Terra Archaeology also explained the purpose of the additional work and attached the site map submitted to the Arch Branch.	Site map submitted to the Arch Branch	N/A	Pre-application
12-Aug-20	Squamish Nation	Email	Terra Archaeology	Matt Henderson, Ecologic Consultants Chrystal Nahanee, SN cc: Louise Williams, SN Robyn Ewing, Aspect Heritage Consulting Kim Meyer, Terra Archaeology Denise Jensen, SN Greg Morrissey, Ecologic Consultants	Terra Archaeology let Matt and Chrystal know that they were planning to do some follow-up subsurface testing on August 20, 2020 around the location of the isolated find identified by the field crew on June 22, 2020. The purpose of the work was to complete the evaluation of the site, DhRr-895, to assess potential impacts from Cascadia Phase 4.	Site map submitted to the Arch Branch	N/A	Pre-application
12-Aug-20	Squamish Nation	Email	Matt Henderson, Ecologic Consultants	Ewan Anderson, Terra Archaeology Chrystal Nahanee, SN cc: Louise Williams, SN Robyn Ewing, Aspect Heritage Kim Meyer, Terra Denise Jensen, SN	Matt let Terra Archaeology know that SN would be able to provide a monitor for the one day of the follow-up subsurface testing.	N/A	N/A	Pre-application
13-Aug-20	Tsleil-Waututh Nation	Email	Lauren Bell, TWN	Joe Van Humbeck, CP cc: Kate Menzies, TWN Celine Lee, Hemmera	Details around Capacity Funding Agreements were discussed.	N/A	N/A	Pre-application
13-Aug-20	Tsleil-Waututh Nation	Email	Joe Van Humbeck, CP	Lauren Bell, TWN cc: Celine Lee, Hemmera Kate Menzies, TWN	Joe informed Lauren he was leaving for vacation and details around Capacity Funding Agreements were discussed.	N/A	N/A	Pre-application
13-Aug-20	Tsleil-Waututh Nation	Email	Cheryl Perich, TWN	Ewan Anderson, Terra Archaeology cc: Kim Meyer, Terra Archaeology	TWN asked Terra Archaeology to complete additional information for their monitor request.	N/A	N/A	Pre-application
13-Aug-20	Tsleil-Waututh Nation	Email	Terra Archaeology	Cheryl Perich, TWN cc: Kim Meyer, Terra Archaeology	Terra Archaeology provided additional information about upcoming monitoring on August 20, 2020.	N/A	N/A	Pre-application
13-Aug-20	Kwikwetlem First Nation	Email	Nicole Oakes, KFN	Terra Archaeology	Nicole let Terra Archaeology know that KFN will defer field technician participation next week to other Indigenous communities and asked to be updated on progress and results.	N/A	N/A	Pre-application
13-Aug-20	Kwikwetlem First Nation	Email	Terra Archaeology	Nicole Oakes, KFN	Terra Archaeology confirmed sending KFN an update on the additional subsurface testing around the location of the isolated find identified by the field crew on June 22, 2020.	N/A	N/A	Pre-application
17-Aug-20	Musqueam Indian Band	Email	Celine Lee, Hemmera	Erin Larocque, MIB	Celine let Erin know that the following Tuesday-Friday worked for her team for the Offsetting Workshop if that was of interest to MIB Fisheries.	N/A	N/A	Pre-application
18-Aug-20	Musqueam Indian Band	Email	Erin Larocque, MIB	Celine Lee, Hemmera	Sarah confirmed Fisheries interest in participating in the Offsetting Workshop. She said next week should be fine, but noted she would have to get back to Celine with availability because a community member passed away.	N/A	1. Hemmera/CP to set up Offsetting meeting with Erin Larocque	Pre-application
18-Aug-20	Musqueam Indian Band	Email	Celine Lee, Hemmera	Erin Larocque, MIB	Celine thanked Sarah for letting her know and passed on her condolences about the death in the community.	N/A	N/A	Pre-application
18-Aug-20	Squamish Nation	Email	Terra Archaeology	Matt Henderson, Ecologic Consultants Chrystal Nahanee, SN cc: Louise Williams, SN Robyn Ewing, Aspect Heritage Consulting Kim Meyer, Terra Denise Jensen, SN Greg Morrissey, Ecologic Consultants	Terra Archaeology let Ecological Consultants know that they would be meeting a CP flagger at the Confederation Park parking lot off of Penzance Drive in Burnaby on Thursday and asked if Cyrus would be available or someone else. The work would be to complete an assessment of archaeological site DhRr-895 and would involve excavating subsurface tests in the vicinity of the original find location to determine whether subsurface archaeological remains were present.	N/A	N/A	Pre-application

### Engagement Log

Date	Indigenous Community	Method	Sender/Attendee	Recipient	Description	Attachment(s)	Current Actions	Project Phase
18-Aug-20	Squamish Nation	Email	Matt Henderson, Ecologic Consultants	Ewan Anderson, Terra Archaeology cc: Robyn Ewing, Aspect Heritage Consulting Kim Meyer, Terra Archaeology Denise Jensen, SN Greg Morrissey, Ecologic Consultants Chrystal Nahanee, SN	Ecologic Consultants responded to Terra Archaeology's request for Cyrus to attend the site visit, indicating he may be able to attend but they would have to confirm closer to the date of the site visit.	N/A	N/A	Pre-application
19-Aug-20	Squamish Nation	Email	Terra Archaeology	Matt Henderson, Ecologic Consultants cc: Robyn Ewing, Aspect Heritage Consulting Kim Meyer, Terra Archaeology Denise Jensen, SN Greg Morrissey, Ecologic Consultants Chrystal Nahanee, SN	Terra Archaeology let Ecologic Consultants know that they were receiving conflicting information regarding where they would meet the CP flagger for the site visit and archaeological site assessment work. Terra Archaeology requested if Cyrus or another field tech could make it, but couldn't find the team, to call Ewan.	N/A	N/A	Pre-application
19-Aug-20	Squamish Nation	Email	Terra Archaeology	Matt Henderson, Ecologic Consultants cc: Robyn Ewing, Aspect Heritage Consulting Denise Jensen, SN Greg Morrissey, Ecologic Consultants Chrystal Nahanee, SN	Terra Archaeology confirming the meeting location with the CP flagger for the site visit and archeological site assessment work.	N/A	N/A	Pre-application
19-Aug-20	Squamish Nation	Email	Matt Henderson, Ecologic Consultants	Ewan Anderson, Terra Archaeology cc: Robyn Ewing, Aspect Heritage Consulting Denise Jensen, SN Greg Morrissey, Ecologic Consultants Chrystal Nahanee, SN	Ecologic Consultants let Terra Archaeology know none of their monitors would be available for the site visit and archeological site assessment work; Matt asked if he could swing by instead.	N/A	N/A	Pre-application
19-Aug-20	Squamish Nation	Email	Terra Archaeology	Matt Henderson, Ecologic Consultants cc: Robyn Ewing, Aspect Heritage Consulting Denise Jensen, SN Greg Morrissey, Ecologic Consultants Chrystal Nahanee, SN	Terra Archaeology let Ecologic Consultants know that they would have to coordinate with the CP flagger if Matt were to attend site because they only had a 3-hour window to complete the works (which had to be chaperoned).	N/A	N/A	Pre-application
19-Aug-20	Squamish Nation	Email	Matt Henderson, Ecologic Consultants	Ewan Anderson, Terra Archaeology cc: Robyn Ewing, Aspect Heritage Consulting Denise Jensen, SN Greg Morrissey, Ecologic Consultants Chrystal Nahanee, SN	Ecologic Consultants confirmed with Terra Archaeology that they would not be attending the site visit and archeological site assessment work due to the time constraints and complexity of coordinating with the chaperone.	N/A	N/A	Pre-application
19-Aug-20	Kwikwetlem First Nation	Email	Celine Lee, Hemmera	Craig Orr, KFN Sarah Prien, KFN Matt Henderson, Ecologic Consultants cc: Joe Van Humbeck, CP Kiley Gibson, CP Joshua Jodoi, Hemmera Tim Edgell, Hemmera	Celine thanked Craig, Sarah, and Matt for meeting to discuss offsetting and Cascadia Phase 4 in general. Celine asked if KFN (1) anticipates proposing specific offsetting option(s) and/or (2) would prefer that Hemmera's team provide details on specific option(s) for review and comment (prior to completion of the draft Offsetting Plan. She added that Hemmera/CP would send the draft Offsetting Plan and draft Aquatic Effects Assessment (AEA) for formal review and comment. She also offered to set up a call between KFN and fisheries biologist from Hemmera to further discuss Offsetting options.	Offsetting Workshop Presentation, Map of Potential Offsetting Locations (standalone version of the map in the presentation), draft Meeting Minutes	N/A	Pre-application
19-Aug-20	Tsleil-Waututh Nation	Email	Celine Lee, Hemmera	Katie Menzies, TWN Lauren Bell, TWN Brittany John, TWN Lindsey Ogston, TWN cc: Joe Van Humbeck, CP Kiley Gibson, CP Joshua Jodoi, Hemmera Tim Edgell, Hemmera	Celine thanked Katie, Lauren, Brittany, and Lindsey for meeting to discuss offsetting and Cascadia Phase 4 in general. Celine asked if TWN 1 anticipates proposing specific offsetting option(s) and/or would prefer that Hemmera's team provide details on specific option(s) for review and comment (prior to completion of the draft Offsetting Plan. She added that Hemmera/CP would send the draft Offsetting Plan and draft AEA for review and comment. She also offered to set up a call between TWN and fisheries biologist from Hemmera to further discuss Offsetting options.	Offsetting Workshop Presentation, Map of Potential Offsetting Locations (standalone version of the map in the presentation), draft Meeting Minutes	1.Hemmera/CP to send draft Offsetting Plan for review and comment to Lauren at TWN.	Pre-application
21-Aug-20	Squamish Nation	Email	Terra Archaeology	Matt Henderson, Ecologic Consultants cc: Robyn Ewing, Aspect Heritage Consulting Denise Jensen, SN Greg Morrissey, Ecologic Consultants Chrystal Nahanee, SN	Terra Archaeology provided details on the field work completed on Aug 20, 2020. Six shovel tests were excavated in the vicinity of the surface find, arranged in a 5 m-spaced, 3 x 2 grid covering the upper half of the exposed beach, and centered on the surface find location. All excavated materials were water screened through 6 mm mesh. Terra Archaeology described the sediments/materials that were encountered and details of the visual assessment at the exposed area on either side of Rainbow Creek, and didn't find any additional archeological remains. No further archaeological work was recommended, but Terra Archaeology did recommend a Chance Find Procedure be in place prior to construction activities.	Four photos of testing, survey and excavation work	N/A	Pre-application
21-Aug-20	Kwikwetlem First Nation	Email	Terra Archaeology	Nicole Oakes, KFN	Terra Archaeology provided a summary on the additional subsurface testing around the location of the isolate find identified by the field crew on June 22, 2020.	N/A	N/A	Pre-application

## Engagement Log

Date	Indigenous Community	Method	Sender/Attendee	Recipient	Description	Attachment(s)	Current Actions	Project Phase
21-Aug-20	Kwikwetlem First Nation	Email	Craig Orr, KFN	Celine Lee, Hemmera Sarah Prien, KFN Matt Henderson, Ecologic Consultants cc: Joe Van Humbeck, CP Kiley Gibson, CP Joshua Jodoin, Hemmera Tim Edgell, Hemmera	Craig thanked Celine and mentioned that he thought it was a good meeting. He said he would personally prefer Hemmera to provide more details on specific offsetting options. He would also like to see more detail on species/habitats to be enhanced, productivity estimates, feasibility, and location with respect to KFN's core territory. He thinks a great outcome would be to enhance herring spawning and productivity in Burrard Inlet. Craig said he would appreciate more information on the reef structures Joe mentioned. He suggested a call with Tim might be the first order of business. Craig had no amendment to the meeting minutes.	N/A	N/A	Pre-application
24-Aug-20	Kwikwetlem First Nation	Email	Celine Lee, Hemmera	Craig Orr, KFN cc: Joe Van Humbeck, CP Kiley Gibson, CP Sarah Prien, KFN Matt Henderson, Ecologic Consultants Joshua Jodoin, Hemmera Tim Edgell, Hemmera	Celine thanked Craig for reviewing the minutes, and for letting Hemmera/CP know his preferences for next steps. She said she would follow up with Craig regarding the reef structures as soon as possible as well as touch base with Tim about a call.	N/A	N/A	Pre-application
27-Aug-20	Tsleil-Waututh Nation	Email	Lauren Bell, TWN	Celine Lee, Hemmera Kate Menzies, TWN Brittany John, TWN Lindsey Ogston, TWN cc: Joe Van Humbeck, CP Kiley Gibson, CP Joshua Jodoin, Hemmera Tim Edgell, Hemmera	Lauren thanked Celine for sharing the presentation, map and minutes for the offsetting workshop. Lauren confirmed that TWN prefer to review and comment on any specific options that Hemmera suggest as opposed to bringing suggestions to Hemmera. Lauren and team also provided additions to the meeting minutes that Celine listed in her last email.	N/A	N/A	Pre-application
28-Aug-20	Tsleil-Waututh Nation	Email	Celine Lee, Hemmera	cc: Lauren Bell, TWN Lindsey Ogston, TWN Kate Menzies, TWN Brittany John, TWN Joe Van Humbeck, CP Kiley Gibson, CP Joshua Jodoin, Hemmera Tim Edgell, Hemmera	Celine thanked Lauren for sharing her preference to review and comment on specific options, as well as identifying additional TWN priorities. She confirmed that Hemmera will provide further details regarding offsetting options as soon as possible, and update and redistribute the meeting minutes early next week.	N/A	N/A	Pre-application
28-Aug-20	Tsleil-Waututh Nation	Email	Joe Van Humbeck, CP	Denise Bessette, CP cc: Lauren Bell, TWN Kate Menzies, TWN Celine Lee, Hemmera Kiley Gibson, CP	Joe approved the attached PREQ.	PREQ	N/A	Pre-application
1-Sep-20	Tsleil-Waututh Nation	Email	Lauren Bell, TWN	Joe Van Humbeck, CP Denise Bessette, CP cc: Kate Menzies, TWN Celine Lee, Hemmera Kiley Gibson, CP	Details around Capacity Funding Agreements were discussed.	N/A	N/A	Pre-application
2-Sep-20	Tsleil-Waututh Nation	Email	Joe Van Humbeck, CP	Lauren Bell, TWN Denise Bessette, CP cc: Celine Lee, Hemmera Kate Menzies, TWN Kiley Gibson, CP	Details around Capacity Funding Agreements were discussed.	N/A	N/A	Pre-application
3-Sep-20	Tsleil-Waututh Nation	Email	Celine Lee, Hemmera	Lauren Bell, TWN cc: Joe Van Humbeck, CP Kiley Gibson, CP Joshua Jodoin, Hemmera Tim Edgell, Hemmera Kate Menzies, TWN Brittany John, TWN Lindsey Ogston, TWN	Celine provided Lauren with the updated Offsetting Workshop Meeting Minutes. Celine noted that Hemmera/CP will provide the draft AEA and further details regarding offsetting within the coming weeks.	Offsetting Workshop Aug 11 Final Meeting Minutes	1.Hemmera/CP to send the draft Aquatic Effects Assessment to Lauren.	Pre-application
3-Sep-20	Kwikwetlem First Nation	Email	Celine Lee, Hemmera	Craig Orr, KFN cc: Joe Van Humbeck, CP Kiley Gibson, CP Joshua Jodoin, Hemmera Tim Edgell, Hemmera Matt Henderson, Ecologic Consultants	Celine provided Craig with the updated Offsetting Workshop Meeting Minutes. Celine confirmed that she hadn't yet been in touch to arrange a follow-up discussion, as they were investigating the feasibility of different offsetting options. Celine noted that Hemmera/CP will provide the draft AEA and further details regarding offsetting within the coming weeks.	Offsetting Workshop Aug 11 Final Meeting Minutes	N/A	Pre-application



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Date	Indigenous Community	Method	Sender/Attendee	Recipient	Description	Attachment(s)	Current Actions	Project Phase
3-Sep-20	Tsleil-Waututh Nation	Email	Lauren Bell, TWN	Celine Lee, Hemmera cc: Joe Van Humbeck, CP Kiley Gibson, CP Joshua Jodoin, Hemmera Tim Edgell, Hemmera Kate Menzies, TWN Brittany John, TWN Lindsey Ogston, TWN	Lauren thanked Celine for the updated minutes and said she looks forward to reviewing the draft AEA and Offsetting Plans once they become available.	N/A	N/A	Pre-application
8-Sep-20	Tsleil-Waututh Nation	Email	Celine Lee, Hemmera	Lauren Bell, TWN cc: Joe Van Humbeck, CP Kiley Gibson, CP Joshua Jodoin, Hemmera Tim Edgell, Hemmera Kate Menzies, TWN Brittany John, TWN Lindsey Ogston, TWN	Celine responded to Lauren's previous email on September 3, 2020.	N/A	N/A	Pre-application
14-Sep-20	Musqueam Indian Band	Email	Celine Lee, Hemmera	Erin Larocque, MIB Eliza Bethune, Hemmera	Celine hoped the community is well and was checking to see if MIB still had an interest in meeting with CP regarding offset planning.	N/A	N/A	Pre-application
15-Sep-20	Tsleil-Waututh Nation	Email	Lauren Bell, TWN	Joe Van Humbeck, CP Denise Bessette, CP cc: Celine Lee, Hemmera Kate Menzies, TWN Kiley Gibson, CP	Details around Capacity Funding Agreements were discussed.	N/A	N/A	Pre-application
21-Sep-20	Musqueam Indian Band	Email	Erin Larocque, MIB	Celine Lee, Hemmera Eliza Bethune, Hemmera	Erin let Celine know that a prominent Musqueam community member passed away and as a result a number of meetings were pushed back. Erin asked Celine what timelines look like so she can get a sense of when they would need to meet by. She said she would check with Fisheries on whether there is still interest and capacity.	N/A	N/A	Pre-application
23-Sep-20	Tsleil-Waututh Nation	Email	Joe Van Humbeck, CP	Lauren Bell, TWN Denise Bessette, CP cc: Celine Lee, Hemmera Kate Menzies, TWN Kiley Gibson, CP	Details around Capacity Funding Agreements were discussed.	N/A	N/A	Pre-application
23-Sep-20	Kwikwetlem First Nation	Email	Celine Lee, Hemmera	Craig Orr, KFN cc: Sarah Prien, KFN Morgan Tanner, Hemmera	Celine provided an update on the Cascadia Phase 4 offset planning and explained that CP/Hemmera would like to share the offsetting concept designed with KFN's feedback via a 1-hour videoconference meeting. Celine also notified Craig this was her last week with Hemmera and that Morgan Tanner would be taking over communications for Cascadia Phase 4.	N/A	N/A	Pre-application
23-Sep-20	Squamish Nation	Email	Celine Lee, Hemmera	Denise Jensen, SN cc: Morgan Tanner, Hemmera	Celine explained that Cascadia Phase 3 had artificial reef construction taking place during the week of September 29, 2020 – October 6, 2020 as part of the offsetting program and asked if SN would like to receive any field reports from these activities. She added that CP/Hemmera are still available to meet to discuss the proposed offsetting activities Cascadia Phase 4. Celine also notified Denise this was her last week with Hemmera and that Morgan Tanner would be taking over communications for Cascadia Phase 4.	N/A	N/A	Pre-application
23-Sep-20	Tsleil-Waututh Nation	Email	Celine Lee, Hemmera	Lauren Bell, TWN cc: Kate Menzies, TWN Morgan Tanner, Hemmera	Celine shared that Hemmera's team had developed an offsetting concept for Burrard Inlet based on TWN's feedback and requested that TWN meet with CP/Hemmera to discuss the proposed offsetting concept. She also noted that it was her last week with Hemmera and that Morgan Tanner would be taking over communications for Cascadia Phase 3 and 4.	N/A	N/A	Pre-application
23-Sep-20	Musqueam Indian Band	Email	Celine Lee, Hemmera	Erin Larocque, MIB Morgan Tanner, Hemmera	Celine said she was sorry to hear about the passing of Bud Sparrow and thanked Erin for making the time to get in touch. She explained that CP/Hemmera have recently developed an offsetting concept and would be happy to share with the MIB Fisheries team to present and discuss this as early as next week. Celine also let Erin know that this was her final week with Hemmera.	N/A	N/A	Pre-application
24-Sep-20	Kwikwetlem First Nation	Email	Craig Orr, KFN	Celine Lee, Hemmera Sarah Prien, KFN Morgan Tanner, Hemmera	Craig wished Celine luck at her new position. Craig added that there was more potential for offsetting options and explained his interest in the rockfish option. He also shared his availability to meet with CP for the following week.	N/A	N/A	Pre-application

## Engagement Log

Date	Indigenous Community	Method	Sender/Attendee	Recipient	Description	Attachment(s)	Current Actions	Project Phase
24-Sep-20	Squamish Nation	Email	Denise Jensen, SN	Celine Lee, Hemmera cc: Morgan Tanner, Hemmera	Denise confirmed that SN would like to receive field reports. No mention of any Cascadia Phase 4 activities.	N/A	N/A	Pre-application
24-Sep-20	Squamish Nation	Email	Celine Lee, Hemmera	Denise Jensen, SN cc: Morgan Tanner, Hemmera	Celine confirmed that CP/Hemmera would send field reports after the reef construction. No follow-up on Cascadia Phase 4 activities.	N/A	1.Hemmera/CP to send SN field reports after the reef construction.	Pre-application
2-Oct-20	Tsleil-Waututh Nation	Email	Lauren Bell, TWN	Joe Van Humbeck, CP cc: Kate Menzies, TWN Denise Besette, CP Kiley Gibson, CP Morgan Tanner, Hemmera	Details around Capacity Funding Agreements were discussed.	N/A	N/A	Pre-application
2-Oct-20	Tsleil-Waututh Nation	Email	Lauren Bell, TWN	Morgan Tanner, Hemmera cc: Kate Menzies, TWN	Lauren introduced herself and Kate to Morgan. She asked if CP/Hemmera were available to meet on October 7, 2020 at 2:00 pm.	N/A	N/A	Pre-application
5-Oct-20	Kwikwetlem First Nation	Email	Morgan Tanner, Hemmera	Matt Henderson, Ecologic Consultants	Morgan let Matt know that there would be environmental monitoring for Cascadia Phase 4 construction and offsetting work starting in late 2021. She added that CP/Hemmera is working to establish regular meetings with KFN to provide Project updates.	N/A	N/A	Pre-application
6-Oct-20	Kwikwetlem First Nation	Phone	Morgan Tanner, Hemmera	Craig Orr, KFN	Morgan phoned Craig to discuss Cascadia Phase 4. KFN interests include: 1.Want to enhance rockfish 2.Want to enhance surf smelt seeding 3.Want to enhance ball kelp (it's herring spawning habitat) 4.Want to see offsetting in core territory vs Indian arm Joe Van Humbeck was to provide example on reef balls in Prince Rupert	N/A	N/A	Pre-application
8-Oct-20	Kwikwetlem First Nation	Email	Morgan Tanner, Hemmera	Craig Orr, KFN Sarah Prien, KFN	Morgan thanked Craig for calling earlier within the week. She asked if KFN would be available to meet with CP/Hemmera on October 21, 2020.	N/A	N/A	Pre-application
8-Oct-20	Tsleil-Waututh Nation	Email	Morgan Tanner, Hemmera	Lauren Bell, TWN cc: Kate Menzies, TWN Joe Van Humbeck, CP Kiley Gibson, CP Joshua Jodoin, Hemmera	Morgan provided CP/Hemmera's availability to meet with TWN in October 2020.	N/A	N/A	Pre-application
8-Oct-20	Kwikwetlem First Nation	Email	Craig Orr, KFN	Morgan Tanner, Hemmera Sarah Prien, KFN	Craig confirmed availability to meet with CP/Hemmera on October 21, 2020.	N/A	N/A	Pre-application
10-Oct-20	Musqueam Indian Band	Email	Erin Larocque, MIB	Celine Lee, Hemmera	Erin informed Celine that this week was tricky in terms of scheduling and said she would get back to Celine about the Offsetting Workshop if she heard from Fisheries.	N/A	N/A	Pre-application
13-Oct-20	Tsleil-Waututh Nation	Email	Lauren Bell, TWN	Morgan Tanner, Hemmera cc: Kate Menzies, TWN Joe Van Humbeck, CP Kiley Gibson, CP Joshua Jodoin, Hemmera	TWN proposed new meeting dates/times.	N/A	N/A	Pre-application
13-Oct-20	Tsleil-Waututh Nation	Email	Morgan Tanner, Hemmera	Lauren Bell, TWN cc: Kate Menzies, TWN Joe Van Humbeck, CP Kiley Gibson, CP Joshua Jodoin, Hemmera	Morgan thanked Lauren for getting back to her and let her know that she would discuss the meeting dates proposed by Lauren with CP.	N/A	N/A	Pre-application
14-Oct-20	Tsleil-Waututh Nation	Email	Morgan Tanner, Hemmera	Lauren Bell, TWN cc: Kate Menzies, TWN Joe Van Humbeck, CP Kiley Gibson, CP Joshua Jodoin, Hemmera	Morgan confirmed that October 28 at 1:00 pm worked for the CP/Hemmera team and would follow-up shortly with a Microsoft Teams meeting invite.	N/A	N/A	Pre-application
14-Oct-20	Stó:lō Nation	Email	Terra Archaeology	Cara Brendzy, Stó:lō	Terra Archaeology provided Stó:lō with a copy of the Archaeological Impact Assessment (AIA) conducted for Cascadia Phase 4 for their review and comment. Terra Archaeology noted they hope to send the AIA report to the Arch Branch on October 26, 2020, but if Stó:lō needed more time to review to let them know.	AIA Report	N/A	Pre-application
14-Oct-20	Squamish Nation	Email	Terra Archaeology	Matt Henderson, Ecologic Consultants cc: Robyn Ewing, Aspect Heritage Consulting Denise Jensen, SN Greg Morrissey, Ecologic Consultants Chrystal Nahanee, SN	Terra Archaeology shared the AIA report conducted for Cascadia Phase 4 and requested that SN review the report and provide any questions or comments by October 26, 2020.	AIA Report	N/A	Pre-application
14-Oct-20	Tsleil-Waututh Nation	Email	Terra Archaeology	Cheryl Perich, TWN cc: Kim Meyer, Terra Archaeology Evan Hardy, TWN	Terra Archaeology sent the AIA report conducted for Cascadia Phase 4 and requested that TWN review the report and provide any questions or comments by October 26, 2020.	AIA Report	N/A	Pre-application

## Engagement Log

Date	Indigenous Community	Method	Sender/Attendee	Recipient	Description	Attachment(s)	Current Actions	Project Phase
14-Oct-20	Kwkwetlem First Nation	Email	Terra Archaeology	Nicole Oakes, KFN	Terra Archaeology provided KFN with a copy of the AIA conducted for Cascadia Phase 4 for their review and comments. Terra Archaeology noted they hope to send the AIA report to the Arch Branch on October 26, 2020, but if KFN needed more time to review to let them know.	AIA Report	N/A	Pre-application
18-Oct-20	Kwkwetlem First Nation	Email	Craig Orr, KFN	Morgan Tanner, Hemmera Sarah Prien, KFN	Craig asked Morgan if the meeting between KFN and CP/Hemmera planned for October 21, 2020 could be moved as KFN was hoping to go on a trip to the upper watershed on Wednesday.	N/A	N/A	Pre-application
19-Oct-20	Musqueam Indian Band	Email	Morgan Tanner, Hemmera	Erin Larocque, MIB cc: Joe Van Humbeck, CP Kiley Gibson, CP	Morgan sent a follow-up from Celine's last email regarding Cascadia Phase 4. She asked if Erin's team was still interested in meeting with CP to discuss offsetting in the Burrard Inlet. She also offered to provide project information, if requested.	N/A	N/A	Pre-application
19-Oct-20	Squamish Nation	Email	Morgan Tanner, Hemmera	Denise Jensen, SN cc: Joe Van Humbeck, CP Kiley Gibson, CP	Morgan sent a follow-up to Celine's emails regarding Cascadia Phase 4 and asked if SN was interested in participating in an offsetting workshop. She added that CP is currently planning to send SN the Offsetting Plan for review once it has been drafted.	N/A	1.Hemmera/CP to send SN the Offsetting Plan for review.	Pre-application
19-Oct-20	Kwkwetlem First Nation	Email	Morgan Tanner, Hemmera	Craig Orr, KFN Sarah Prien, KFN	Morgan let Craig know that moving the meeting was not a problem. She offered to provide new meeting dates for next week and early November.	N/A	N/A	Pre-application
20-Oct-20	Kwkwetlem First Nation	Email	Morgan Tanner, Hemmera	Craig Orr, KFN Sarah Prien, KFN Joe Van Humbeck, CP Kiley Gibson, CP Tim Edgell, Hemmera Joshua Jodoin, Hemmera Trevor Welton, Hemmera Joe Walker, Hemmera	Morgan said they will look to reschedule the offsetting workshop meeting between CP/Hemmera and KFN on for the final week in October of first week in November as per Craig's request.	N/A	N/A	Pre-application
21-Oct-20	Kwkwetlem First Nation	Email	Morgan Tanner, Hemmera	Craig Orr, KFN Sarah Prien, KFN cc: Joe Van Humbeck, CP Kiley Gibson, CP	Morgan hoped Craig's field day was nice and asked if KFN was available to meet on November 2, 2020 or November 3, 2020 to discuss Cascadia Phase 4 offsetting.	N/A	N/A	Pre-application
22-Oct-20	Kwkwetlem First Nation	Email	Craig Orr, KFN	Morgan Tanner, Hemmera Sarah Prien, KFN cc: Joe Van Humbeck, CP Kiley Gibson, CP	Craig said he was available to meet either day, but had a meeting scheduled on November 3, 2020 at 9:00 AM.	N/A	N/A	Pre-application
22-Oct-20	Kwkwetlem First Nation	Email	Morgan Tanner, Hemmera	Craig Orr, KFN Sarah Prien, KFN cc: Joe Van Humbeck, CP Kiley Gibson, CP	Morgan confirmed CP/Hemmera's availability to meet with KFN on November 2, 2020.	N/A	N/A	Pre-application
23-Oct-20	Musqueam Indian Band	Email	Terra Archaeology	Referrals, MIB	Terra Archaeology provided MIB with the AIA Report via the Stewardship Portal Administrator.	AIA Report	N/A	Pre-application
23-Oct-20	Musqueam Indian Band	Email	Referrals, MIB	Terra Archaeology	Aviva said she has no concerns or comments about the report.	N/A	N/A	Pre-application
28-Oct-20	Tsleil-Waututh Nation	Meeting	Kate Menzies, TWN Lauren Bell, TWN Joe Van Humbeck, CP Kiley Gibson, CP Morgan Tanner, Hemmera Tim Edgell, Hemmera Trevor Welton, Hemmera	N/A	Hemmera/CP met with TWN to discuss the conceptual habitat design.	N/A	1.Morgan will provide a documents table with proposed review dates/timelines and page length to TWN to aid document review. 2.Morgan to inform Kate about the node locations after confirmation is received from the Port. 3.Kate and Lauren to update other TWN employees on the discussions and information presented today.	Pre-application
30-Oct-20	Tsleil-Waututh Nation	Email	Lauren Bell, TWN	Morgan Tanner, Hemmera Katie Menzies, TWN cc: Joe Van Humbeck, CP Kiley Gibson, CP Tim Edgell, Hemmera Trevor Welton, Hemmera	Lauren thanked Morgan for organizing the meeting on Wednesday and provided feedback from TWN.	N/A	N/A	Pre-application
2-Nov-20	Kwkwetlem First Nation	Email	Morgan Tanner, Hemmera	Matt Henderson, Ecologic Consultants	Morgan followed up with Matt to see if he was planning on attending the meeting between KFN and CP/Hemmera that afternoon.	N/A	N/A	Pre-application
2-Nov-20	Kwkwetlem First Nation	Email	Matt Henderson, Ecologic Consultants	Morgan Tanner, Hemmera	Matt thanked Morgan for the invite and noted his participation was not required during early discussions.	N/A	N/A	Pre-application



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2-Nov-20	Kwikwetlem First Nation	Meeting	Craig Orr, KFN Kiley Gibson, CP Morgan Tanner, Hemmera Tim Edgell, Hemmera Trevor Welton, Hemmera	N/A	Hemmera/CP met with KFN to discuss the draft conceptual habitat design.	N/A	1. Craig to provide comments from KFN on the draft conceptual offsetting design to Hemmera/CP. 2. Morgan to update Craig on discussions between CP/Hemmera with the Port when possible.	Pre-application
2-Nov-20	Kwikwetlem First Nation	Email	Morgan Tanner, Hemmera	Craig Orr, KFN cc: Kiley Gibson, CP Joe Van Humbeck, CP Sarah Prien, CP	Morgan thanked Craig for meeting and attached the presentation for his reference. She also included the TWN n contacts that CP presented to last week.	N/A	N/A	Pre-application
2-Nov-20	Kwikwetlem First Nation	Email	Craig Orr, KFN	Morgan Tanner, Hemmera cc: Kiley Gibson, CP Joe Van Humbeck, CP Sarah Prien, CP	Craig thanked Morgan for work on the plan.	N/A	N/A	Pre-application
9-Nov-20	Tsleil-Waututh Nation	Email	Morgan Tanner, Hemmera	Lauren Bell, TWN Kate Menzies, TWN cc: Joshua Jodoin, Hemmera Joe Van Humbeck, CP Kiley Gibson, CP	Morgan thanked Lauren and Kate for the meeting follow-up email. She attached the Offsetting Workshop presentation and draft Aquatics Effects Assessment (AEA) and presented some notes on the draft AEA and document review.	Offsetting Workshop Presentation and draft AEA	1. Hemmera/CP to let TWN know if the Project footprint changes are substantial and/or occur outside of the assessment buffer.	Pre-application
9-Nov-20	Kwikwetlem First Nation	Email	Morgan Tanner, Hemmera	Craig Orr, KFN Sarah Prien, KFN cc: Joshua Jodoin, Hemmera Joe Van Humbeck, CP Kiley Gibson, CP	Morgan thanked Craig and Sarah for meeting with Hemmera/CP and a attached the draft AEA. Morgan also included some notes on the draft AEA and the review.	draft AEA	1. Hemmera/CP to let KFN know if the Project footprint changes are substantial and/or occur outside of the assessment buffer.	Pre-application
10-Nov-20	Kwikwetlem First Nation	Email	Sarah Prien, KFN	Morgan Tanner, Hemmera cc: Robert Corman, KFN Craig Orr, KFN	Sarah thanked Morgan for keeping KFN informed and for understanding capacity issues they have been having. Sarah asked Hemmera/CP to provide a project-wide breakdown of the documents that KFN will be required to review.	N/A	1. Hemmera/CP to provide a project-wide breakdown of the documents that KFN will be required to review.	
16-Nov-20	Kwikwetlem First Nation	Email	Morgan Tanner, Hemmera	Sarah Prien, KFN Robert Corman, KFN Craig Orr, KFN	Morgan confirmed that Hemmera/CP will send a project-wide breakdown of the documents that KFN will be required to review.	N/A	N/A	Pre-application
17-Nov-20	Kwikwetlem First Nation	Email	Craig Orr, KFN	Morgan Tanner, Hemmera Sarah Prien, KFN cc: Robert Corman, KFN	Craig let Morgan know that he started looking at the AEA and asked if Hemmera could send a Word version of the document.	N/A	N/A	Pre-application
17-Nov-20	Kwikwetlem First Nation	Email	Morgan Tanner, Hemmera	Craig Orr, KFN Sarah Prien, KFN cc: Robert Corman, KFN	Morgan shared the Word version of the AEA document with Craig and asked that he please use track changes and the comment tool to provide feedback.	draft AEA	N/A	Pre-application
17-Nov-20	Tsleil-Waututh Nation	Email	Morgan Tanner, Hemmera	Lauren Bell, TWN Katie Menzies, TWN cc: Joe Van Humbeck, CP Kiley Gibson, CP Tim Edgell, Hemmera Trevor Welton, Hemmera	Morgan provided responses from CP/Hemmera to TWN's inquiries in follow-up to the Cascadia Phase 4 meeting where the habitat node concept was discussed.	N/A	N/A	Pre-application
17-Nov-20	Tsleil-Waututh Nation	Email	Lauren Bell, TWN	Morgan Tanner, Hemmera Katie Menzies, TWN cc: Joe Van Humbeck, CP Kiley Gibson, CP Tim Edgell, Hemmera Trevor Welton, Hemmera	Lauren thanked Morgan for providing response to TWN's concerns. Lauren also mentioned that she did not receive the draft AEA.	N/A	N/A	Pre-application
17-Nov-20	Tsleil-Waututh Nation	Email	Morgan Tanner, Hemmera	Lauren Bell, TWN Katie Menzies, TWN cc: Joe Van Humbeck, CP Kiley Gibson, CP Tim Edgell, Hemmera Trevor Welton, Hemmera	Morgan thanked Lauren for letting her know that she did not receive the draft AEA and said she would re-send the email from November 9, 2020 in two sets (one with the AEA and another with the October presentation).	N/A	N/A	Pre-application
17-Nov-20	Tsleil-Waututh Nation	Email	Morgan Tanner, Hemmera	Lauren Bell, TWN Kate Menzies, TWN cc: Joe Van Humbeck, CP Kiley Gibson, CP	Morgan forwarded the original email with the AEA to Lauren.	draft AEA	N/A	Pre-application
17-Nov-20	Tsleil-Waututh Nation	Email	Morgan Tanner, Hemmera	Lauren Bell, TWN Kate Menzies, TWN cc: Kiley Gibson, CP	Morgan tried to re-send just the AEA and noted to Kiley that Joe seemed to have received it.	draft AEA	N/A	Pre-application

## Engagement Log

Date	Indigenous Community	Method	Sender/Attendee	Recipient	Description	Attachment(s)	Current Actions	Project Phase
23-Nov-20	Kwkwetlem First Nation	Email	Morgan Tanner, Hemmera	Craig Orr, KFN Sarah Prien, KFN cc: Robert Corman, KFN Joe Van Humbeck, CP Mike LoVecchio, CP Kiley Gibson, CP Joshua Jodoin, Hemmera	Morgan attached the November 2, 2020 Offsetting Workshop meeting minutes and Geotechnical Report for review and comment. Morgan also shared a Comment Response Tracking Sheet for KFN's review and comment of Project documents.	November 2, 2020 Offsetting Workshop Meeting Minutes, Geotechnical Report, Comment Response Tracking Sheet	1. Craig to provide comments from KFN on the draft conceptual offsetting design to Hemmera/CP. 2. Morgan to update Craig on discussions between CP/Hemmera with the Port when possible. 3. Morgan to follow-up with Sarah on potential document review (including timelines and document length).	Pre-application
23-Nov-20	Tsleil-Waututh Nation	Email	Morgan Tanner, Hemmera	Lauren Bell, TWN Kate Menzies, TWN cc: Joe Van Humbeck, CP Kiley Gibson, CP Joshua Jodoin, Hemmera	Morgan attached the October 28, 2020 Offsetting Workshop meeting minutes and Geotechnical Report for review and comment. Morgan also shared a Comment Response Tracking Sheet for TWN's review and comment of Project documents.	October 28, 2020 Offsetting Workshop Meeting Minutes, Geotechnical Report, Comment Response Tracking Sheet	1. Morgan will provide a documents table with proposed review dates/timelines and page length to TWN to aid document review (targeting this week). 2. Morgan to inform Kate about the node locations after confirmation is received from the Port. 3. Kate and Lauren to update other TWN employees on today's discussion.	Pre-application
25-Nov-20	Tsleil-Waututh Nation	Email	Lauren Bell, TWN	Morgan Tanner, Hemmera Kate Menzies, TWN cc: Joe Van Humbeck, CP Kiley Gibson, CP Joshua Jodoin, Hemmera	Lauren thanked Morgan for sending documents for TWN's review and said the proposed deadlines work well for TWN's schedules. Lauren confirmed that TWN is happy with Hemmera/CP's responses to their concerns regarding the proposed Offsetting Plans. She hopes to provide comments on the AEA in early January.	N/A	N/A	Pre-application
2-Dec-20	Tsleil-Waututh Nation	Email	Morgan Tanner, Hemmera	Lauren Bell, TWN Kate Menzies, TWN cc: Joe Van Humbeck, CP Kiley Gibson, CP Joshua Jodoin, Hemmera	Morgan thanked Lauren for confirming the timing of TWN's document review and attached a memo with a table showing estimated timing for document delivery and review.	Document Review Table Memo	N/A	Pre-application
2-Dec-20	Kwkwetlem First Nation	Email	Morgan Tanner, Hemmera	Craig Orr, KFN Sarah Prien, KFN cc: Robert Corman, KFN Joe Van Humbeck, CP Kiley Gibson, CP Joshua Jodoin, Hemmera	Morgan attached a memo with a table showing estimated timing for document delivery and review.	Document Review Table Memo	1. Morgan to check-in on the review of the AEA and Geotech report.	Pre-application
3-Dec-20	Tsleil-Waututh Nation	Email	Morgan Tanner, Hemmera	Lauren Bell, TWN Kate Menzies, TWN cc: Joe Van Humbeck, CP Kiley Gibson, CP Joshua Jodoin, Hemmera	Morgan sent the Noise Assessment Checklist document for review and comment and asked if TWN could provide their review before February 1, 2021.	Noise Assessment Checklist	N/A	Pre-application
3-Dec-20	Kwkwetlem First Nation	Email	Morgan Tanner, Hemmera	Craig Orr, KFN Sarah Prien, KFN cc: Robert Corman, KFN Joe Van Humbeck, CP Kiley Gibson, CP Joshua Jodoin, Hemmera	Morgan sent the Noise Assessment Checklist document for review and comment and asked if KFN could provide their review before February 1, 2021.	Noise Assessment Checklist	N/A	Pre-application
17-Dec-20	Tsleil-Waututh Nation	Email	Lauren Bell, TWN	Morgan Tanner, Hemmera Kate Menzies, TWN cc: Joe Van Humbeck, CP Kiley Gibson, CP Joshua Jodoin, Hemmera	TWN had no comments on the Noise Assessment Checklist and confirmed that they would have some comments in the New Year for the Aquatic Effects Assessment.	N/A	N/A	Pre-application
17-Dec-20	Tsleil-Waututh Nation	Email	Morgan Tanner, TWN	Lauren Bell, TWN Kate Menzies, TWN cc: Joe Van Humbeck, CP Kiley Gibson, CP Joshua Jodoin, Hemmera	Morgan noted that TWN had no comments or concerns at this time on the Noise Assessment Checklist and said she would be sending an email out shortly with the Hydraulic Process and Alteration Report.	N/A	N/A	Pre-application
18-Dec-20	Kwkwetlem First Nation	Email	Morgan Tanner, Hemmera	Craig Orr, KFN Sarah Prien, KFN cc: Robert Corman, KFN Joe Van Humbeck, CP Kiley Gibson, CP Joshua Jodoin, Hemmera	Morgan sent the draft Hydraulic Process and Alteration Report and asked if comments could be provided before February 15, 2021.	draft Hydraulic Process and Alteration Report	N/A	Pre-application

## Engagement Log

Date	Indigenous Community	Method	Sender/Attendee	Recipient	Description	Attachment(s)	Current Actions	Project Phase
18-Dec-20	Tsleil-Waututh Nation	Email	Morgan Tanner, Hemmera	Lauren Bell, TWN Kate Menzies, TWN cc: Joe Van Humbeck, CP Kiley Gibson, CP Joshua Jodoiu, Hemmera	Morgan sent the draft Hydraulic Process and Alteration Report and asked if comments could be provided before February 15, 2021.	draft Hydraulic Process and Alteration Report	N/A	Pre-application
22-Dec-20	Kwikwetlem First Nation	Email	Craig Orr, KFN	Morgan Tanner, Hemmera Sarah Prien, KFN cc: Robert Corman, KFN Joe Van Humbeck, CP Kiley Gibson, CP Joshua Jodoiu, Hemmera	Craig thanked Morgan for sending the draft Hydraulic Process and Alteration Report and wished everyone a nice holiday.	N/A	N/A	Pre-application
4-Jan-21	Squamish Nation	Squamish Connect	Morgan Tanner, Hemmera	Kiley Gibson, CP Squamish Connect	Submission Reference number: 259. Morgan sent the draft Geotechnical Report to SN.	draft Geotechnical Report	N/A	Pre-application
5-Jan-21	Kwikwetlem First Nation	Email	Morgan Tanner, Hemmera	Craig Orr, KFN Sarah Prien, KFN cc: Robert Corman, KFN Joe Van Humbeck, CP Kiley Gibson, CP Joshua Jodoiu, Hemmera	Morgan asked Craig how his holiday went and mentioned the CP/Hemmera was looking forward to seeing KFN's response on the AEA, and the Hydraulics report. She asked if CP/Hemmera should assume there will be no comments on the draft Geotechnical Report or Noise Assessment Checklist.	N/A	N/A	Pre-application
11-Jan-21	Tsleil-Waututh Nation	Email	Morgan Tanner, Hemmera	Lauren Bell, TWN Kate Menzies, TWN cc: Joe Van Humbeck, CP Kiley Gibson, CP Joshua Jodoiu, Hemmera	Morgan sent a check-in email regarding TWN's review of the AEA and the draft Geotechnical Report.	N/A	N/A	Pre-application
11-Jan-21	Tsleil-Waututh Nation	Email	Lauren Bell, TWN	Morgan Tanner, Hemmera Kate Menzies, TWN cc: Joe Van Humbeck, CP Kiley Gibson, CP Joshua Jodoiu, Hemmera	Lauren thanked Morgan for following up and attached TWN's comments on the AEA. Lauren also confirmed that TWN has no comments on the Geotechnical Report and said TWN look forward to receiving responses to their AEA comments.	TWN's AEA Comments	N/A	Pre-application
11-Jan-21	Tsleil-Waututh Nation	Email	Morgan Tanner, Hemmera	Lauren Bell, TWN Kate Menzies, TWN cc: Joe Van Humbeck, CP Kiley Gibson, CP Joshua Jodoiu, Hemmera	Morgan thanked Lauren for sending TWN's AEA comments and confirming the status of the Geotechnical Report.	N/A	1.CP/Hemmera to respond to TWN's AEA Comments.	Pre-application
11-Jan-21	Musqueam Indian Band	Email	Morgan Tanner, Hemmera	Erin Larocque, MIB cc: Joe Van Humbeck, CP Kiley Gibson, CP	Morgan sent a follow-up email to Erin to see if MIB was still interested in meeting with CP to meet and discuss offsetting. Morgan confirmed that CP/Hemmera will send the draft Offsetting Plan for review, when it's available (targeting February 2021).	N/A	N/A	Pre-application
13-Jan-21	Kwikwetlem First Nation	Email	Sarah Prien, KFN	Morgan Tanner, Hemmera cc: Robert Corman, KFN Craig Orr, KFN	Sarah thanked Morgan for the phone call earlier during the week and attached KFN's comments on the AEA and asked to have information on future Project documentation requiring review by the end of the week.	KFN's AEA Comments	N/A	Pre-application
15-Jan-21	Kwikwetlem First Nation	Email	Morgan Tanner, Hemmera	Sarah Prien, KFN cc: Robert Corman, KFN Craig Orr, KFN Joe Van Humbeck, CP Joshua Jodoiu, Hemmera	Morgan thanked Sarah for providing KFN's comments on the AEA and said CP/Hemmera will begin response efforts shortly. She also confirmed that she would send an updated document review table next week.	N/A	N/A	Pre-application
9-Feb-21	Tsleil-Waututh Nation	Email	Morgan Tanner, Hemmera	Kate Menzies, TWN Eliza Bethune, Hemmera cc: Joe Van Humbeck, CP Kiley Gibson, CP Joshua Jodoiu, Hemmera	Morgan provided an update on the Cascadia Phase 4 document review table and confirmed responses will be provided to TWN's comments on the AEA by the end of the month.	N/A	N/A	Pre-application
9-Feb-21	Kwikwetlem First Nation	Email	Morgan Tanner, Hemmera	Craig Orr, KFN Sarah Prien, KFN Eliza Bethune, Hemmera cc: Joe Van Humbeck, CP Kiley Gibson, CP Joshua Jodoiu, Hemmera	Morgan provided an update on the Project's document review table.	N/A	N/A	Pre-application
12-Feb-21	Tsleil-Waututh Nation	Email	Kate Menzies, TWN	Eliza Bethune, Hemmera cc: Joe Van Humbeck, CP Kiley Gibson, CP Joshua Jodoiu, CP	Kate thanked Morgan for the notice of upcoming documents to review and for the document review table.	N/A	N/A	Pre-application



## Engagement Log

Date	Indigenous Community	Method	Sender/Attendee	Recipient	Description	Attachment(s)	Current Actions	Project Phase
22-Feb-21	Kwikwetlem First Nation	Email	Morgan Tanner, Hemmera	Sarah Prien, KFN Referrals, KFN cc: Robert Corman, KFN Joe Van Humbeck, CP Kiley Gibson, CP	Morgan attached the attached CP's draft Engagement Summary Report for Cascadia Phase 4, and mentioned that the PDF contained all figures and appendices. She also mentions that the word doc. contained the report body only.  Morgan also asked that if the KFN had any comments or feedback on the report, to please put it in the attached table. Morgan noted that per the 45 day review, Hemmera was expecting the KFN comments on or before April 8, 2021.			
26-Feb-21	Musqueam Indian Band	Meeting	Erin Larocque, MIB Morgan Tanner, Hemmera	N/A	Morgan and Erin met to discuss several CP projects including Cascadia Phase 4.	N/A	N/A	Pre-application
4-Mar-21	Tsleil-Waututh Nation	Email	Morgan Tanner, Hemmera	Kate Menzies, TWN cc: Kiley Gibson, CP Referrals, TWN	Morgan shared responses to TWN's comments on the AEA. The spreadsheet shows TWN's comment, CP's response, if the comment was incorporated into the AEA (and if not, why not), the current status of the comment, and any corresponding actions/due dates. Morgan asked to be notified if TWN would like to further reply or discuss a comment and explained the final AEA will be shared by the Vancouver Fraser the Port (the Port) during their consultation period. Morgan asked Kate to let her know if TWN would like CP to send a copy of the AEA directly to TWN for their records. An updated document-review-schedule was also included.	AEA Responses	N/A	Pre-application
4-Mar-21	Kwikwetlem First Nation	Email	Morgan Tanner, Hemmera	Referrals, KFN Sarah Prien, KFN cc: Robert Corman, KFN Craig Orr, KFN Kiley Gibson, CP	Morgan shared response to KFN's comments on the AEA. The spreadsheet shows KFN's comment, CP's response, if the comment was incorporated into the AEA (and if not, why not), the current status of the comment, and any corresponding actions/due dates. Morgan asked to be notified if KFN would like to further reply or discuss a comment and explained the final AEA will be shared by the Port during their consultation period. Morgan asked KFN to let her know if they would like CP to send a copy of the AEA directly to KFN for their records. An updated document-review-schedule was also included.	AEA Responses	N/A	Pre-application
9-Mar-21	Musqueam Indian Band	Email	Morgan Tanner, Hemmera	Erin Larocque, MIB cc: Joe Van Humbeck Mike LoVecchio	Morgan sent documents to Erin that had been discussed during their February 26, 2021 meeting.	Scheduler for CP Projects Map (PDF Figure 1)		Pre-application
12-Mar-21	Musqueam Indian Band	Email	Morgan Tanner, Hemmera	Erin Larocque, MIB cc: Joe Van Humbeck Mike LoVecchio	Erin thanked Morgan for the follow up materials. Erin to follow up with MIB's preferred next steps for each of CP's projects.	N/A	1. Erin to confirm which projects Musqueam would like to discuss further, or which projects require only milestone updates going forward.	Pre-application
12-Mar-21	Kwikwetlem First Nation	Email	Craig Orr, KFN	Morgan Tanner, Hemmera Referrals, KFN cc: Robert Corman, KFN Kiley Gibson	Craig asked if "no comments" on the geotechnical, noise and hydraulics reports could be reworded to reflect that these documents were reviewed by KFN and had no concerns.	N/A	N/A	Pre-application
12-Mar-21	Kwikwetlem First Nation	Email	Morgan Tanner, Hemmera	Craig Orr, KFN Referrals, KFN Sarah Prien, KFN cc: Robert Corman, KFN Kiley Gibson, CP	Morgan said Craig's suggestion is positive and can be easily implemented. She asked Craig if KFN agrees with new text in the document-review schedule.	N/A	N/A	Pre-application
12-Mar-21	Kwikwetlem First Nation	Email	Craig Orr, KFN	Morgan Tanner, Hemmera cc: Referrals, KFN Sarah Prien, KFN Robert Corman, KFN Kiley Gibson, CP	Craig confirmed that the new text in the document-review schedule worked for KFN.	N/A	N/A	Pre-application
16-Mar-21	Kwikwetlem First Nation	Email	Morgan Tanner, Hemmera	Sarah Prien, KFN cc: Robert Corman, KFN Craig Orr, KFN Referrals, KFN Joe Van Humbeck, CP	Morgan asked if the KFN team had availability over the next two weeks or in the beginning of April to meet and discuss the Project.	N/A	N/A	Pre-application
23-Mar-21	Tsleil-Waututh Nation	Email	Morgan Tanner, Hemmera	Kate Menzies, TWN cc: Kiley Gibson, CP Referrals, KFN Joshua Jodoim, Hemmera	Morgan sent the Navigational Impact Assessment and Marine Communications Plan for review and information and noted CP would appreciate receiving comments on or before Friday, May 7, 2021 (45 calendar days from today) via the attached excel table.	Marine Communications Plan, Navigational Impact Assessment, Comment Response Tracking Sheet	N/A	Pre-application

### Engagement Log

Date	Indigenous Community	Method	Sender/Attendee	Recipient	Description	Attachment(s)	Current Actions	Project Phase
23-Mar-21	Kwkwetlem First Nation	Email	Morgan Tanner, Hemmera	Craig Orr, KFN Referrals, KFN Sarah Prien, KFN cc: Robert Corman, KFN Kiley Gibson, CP Joshua Jodoin, Hemmera	Morgan sent the Navigational Impact Assessment and Marine Communications Plan for review and information and noted CP would appreciate receiving comments on or before Friday, May 7, 2021 (45 calendar days from today) via the attached excel table.	Marine Communications Plan, Navigational Impact Assessment, Comment Response Tracking Sheet	N/A	Pre-application
24-Mar-21	Tsleil-Waututh Nation	Email	Morgan Tanner, Hemmera	Kate Menzies, TWN cc: Kiley Gibson, CP Referrals, TWN Joshua Jodoin, Hemmera	Morgan sent the Construction Environmental Management Plan (CEMP) for TWN's review and information and provided an overview of the CEMP. Morgan also attached an excel table to support TWN's review and comments. Morgan explained that it may be redundant to share the FAA (FAA) Application for review. The Offsetting Plan and the Aquatics Effects Assessment make up the FAA Application, both are documents shared with TWN for review. That said, the FAA Application will be shared for TWN's information if TWN would like to see it prior to the Department of Fisheries and Oceans Canada (DFO) sharing it for their consultation. Morgan asked TWN to let her know if they agree with the proposed approach.	CEMP Comment Response Tracking Sheet	N/A	Pre-application
24-Mar-21	Tsleil-Waututh Nation	Email	Kate Menzies, TWN	Morgan Tanner, Hemmera cc: Referrals, TWN Kiley Gibson, CP Joshua Jodoin, Hemmera	Kate agreed with simply providing TWN with the Offsetting Plan and AEA for review and thanked Morgan for sending the CEMP.	N/A	N/A	Pre-application
24-Mar-21	Tsleil-Waututh Nation	Email	Morgan Tanner, Hemmera	Kate Menzies, TWN cc: Kiley Gibson, CP Referrals, TWN Joshua Jodoin, Hemmera	Morgan sent the Offsetting Plan for TWN's review and noted CP was anticipating comments on both the Offsetting Plan and CEMP on May 10, 2021. Morgan explained the Offsetting Plan still proposes a diverse habitat structure; however, instead of building diverse habitats in multiple locations as was discussed, the Port approved one location. Morgan also noted there are gaps in the document related to budget and final design, which have been highlighted in yellow.	Offsetting Plan	N/A	Pre-application
24-Mar-21	Tsleil-Waututh Nation	Email	Kate Menzies, TWN	Morgan Tanner, Hemmera cc: Referrals, TWN Kiley Gibson, CP Joshua Jodoin, Hemmera	Kate thanked Morgan for sending the Offsetting Plan and said the May 10, 2021 comment deadline will likely be okay and will let her know in advance if they foresee any issues with that. Kate confirmed it is disappointing to hear that the Port only approved one location and asked if there were any details on their rationale, or any other aspects of that discussion, that you can be shared.	N/A	N/A	Pre-application
24-Mar-21	Tsleil-Waututh Nation	Email	Morgan Tanner, Hemmera	Referrals, TWN	Morgan apologized for sending the March 23, 2021 email sharing the Navigation Impact Assessment and Marine Communications Plan to the KFN referrals address.	N/A	N/A	Pre-application
24-Mar-21	Kwkwetlem First Nation	Email	Morgan Tanner, Hemmera	Craig Orr, KFN Referrals, KFN cc: Sarah Prien, KFN Robert Corman, KFN Kiley Gibson, CP Joshua Jodoin, Hemmera	Morgan sent the Construction Environmental Management Plan (CEMP) for KFN's review and information and provided an overview of the CEMP. Morgan also attached an excel table to support KFN's review and comments. Morgan explained that she think it may be redundant to share the FAA Application for review. The Offsetting Plan and the Aquatics Effects Assessment make up the FAA Application, both are documents KFN will review. That said, the FAA Application will be shared for KFN's information if KFN would like to see it prior to DFO sharing it for their consultation. Morgan asked KFN to let her know if they agree with the proposed approach.	CEMP	N/A	Pre-application
24-Mar-21	Kwkwetlem First Nation	Email	Craig Orr, KFN	Morgan Tanner, Hemmera cc: Referrals, KFN Sarah Prien, KFN Robert Corman, KFN Kiley Gibson, CP Joshua Jodoin, Hemmera	Craig thanked Morgan and said he was keen to review the Offsetting Plan and did not anticipate any issues in getting comments back by the proposed date.	N/A	N/A	Pre-application
24-Mar-21	Kwkwetlem First Nation	Email	Morgan Tanner, Hemmera	Craig Orr, KFN Referrals, KFN cc: Sarah Prien, KFN Robert Corman, KFN Kiley Gibson, CP Joshua Jodoin, Hemmera	Morgan sent the Offsetting Plan for KFN's review and noted CP was anticipating comments on both the Offsetting Plan and CEMP on May 10, 2021. Morgan explained the Offsetting Plan still proposes a diverse habitat structure; however, instead of building diverse habitats in multiple locations as was discussed, the Port approved one location. Morgan also noted there are gaps in the document related to budget and final design, which have been highlighted in yellow.	Offsetting Plan	N/A	Pre-application

## Engagement Log

Date	Indigenous Community	Method	Sender/Attendee	Recipient	Description	Attachment(s)	Current Actions	Project Phase
25-Mar-21	Tsleil-Waututh Nation	Email	Morgan Tanner, Hemmera	Kate Menzies, TWN cc: Kiley Gibson, CP Referrals, TWN Joshua Jodoin, Hemmera	Morgan thanked Kate for confirming receipt of the Offsetting Plan and explained the Species at Risk and Invasive Species Assessment would be shared with TWN at the beginning of next week. Morgan said CP/Hemmera would not speak exactly to the Port's rational; but, believed the proposed locations were not favoured because they were either not available for offsetting due to other projects having priority, likely navigational issues, and potential conflicts with lease agreements.	N/A	N/A	Pre-application
25-Mar-21	Tsleil-Waututh Nation	Email	Kate Menzies, TWN	Morgan Tanner, Hemmera cc: Referrals, TWN Kiley Gibson, CP Joshua Jodoin, Hemmera	Kate said she appreciated the additional information provided by Morgan around the Port's habitat offsetting decision.	N/A	N/A	Pre-application
25-Mar-21	Kwikwetlem First Nation	Email	Morgan Tanner, Hemmera	Craig Orr, KFN cc: Referrals, KFN Sarah Prien, KFN Robert Corman, KFN Kiley Gibson, CP Joshua Jodoin, Hemmera	Morgan thanked Craig for confirming. She noted that the Species at Risk and Invasive Species Assessment would be available for KFN's review and comment in the following week.	N/A	N/A	Pre-application
25-Mar-21	Kwikwetlem First Nation	Email	Craig Orr, KFN	Morgan Tanner, Hemmera cc: Referrals, KFN Sarah Prien, KFN Robert Corman, KFN Kiley Gibson, CP Joshua Jodoin, Hemmera	Craig said no worries and to send the Species at Risk and Invasive Species Assessment when available.	N/A	N/A	Pre-application
29-Mar-21	Kwikwetlem First Nation	Email	Morgan Tanner, Hemmera	Sarah Prien, KFN Referrals, KFN	Morgan asked Sarah if she was available for a 10-15 min phone check-in (one-on-one) to see how she is doing and what, if any, activities could be scheduled between CP and KFN in the near future. Details around capacity funding were discussed.	N/A	N/A	Pre-application
1-Apr-21	Tsleil-Waututh Nation	Email	Morgan Tanner, Hemmera	Kate Menzies, TWN cc: Kiley Gibson, CP Referrals, TWN Joshua Jodoin, Hemmera	Morgan sent the Species at Risk and Invasive Species Assessments with the Vegetation Overview Plan Report and noted CP would appreciate comments on or before May 31, 2021.	Species at Risk and Invasive Species Assessments with the Vegetation Overview Plan Report	N/A	Pre-application
1-Apr-21	Tsleil-Waututh Nation	Email	Morgan Tanner, Hemmera	Kate Menzies, TWN cc: Kiley Gibson, CP Referrals, TWN Joshua Jodoin, Hemmera	Morgan apologized for the unfinished email that morning and provided an updated document review table in the body of the email. Morgan also shared that the Summary of Engagement comments are targeted for Thursday, April 8, 2021.	N/A	N/A	Pre-application
1-Apr-21	Kwikwetlem First Nation	Email	Morgan Tanner, Hemmera	Craig Orr, KFN cc: Referrals, KFN Kiley Gibson, CP Joshua Jodoin, Hemmera	Morgan sent the Species at Risk and Invasive Species Assessments with the Vegetation Overview Plan Report and noted CP would appreciate comments on or before May 31, 2021.	Species at Risk and Invasive Species Assessments with the Vegetation Overview Plan Report	N/A	Pre-application
5-Apr-21	Tsleil-Waututh Nation	Email	Morgan Tanner, Hemmera	Kate Menzies, TWN cc: Kiley Gibson, CP Referrals, TWN Joshua Jodoin, Hemmera	Morgan sent the Land Requirements Figure for TWN's review and comment and listed upcoming comment return dates for documents shared with TWN to date including: • Summary of Engagement • Marine Communications Plan; Navigational Impact Assessment • EEMP; Offsetting Plan • Species at Risk and Invasive Species Assessment • Land Requirements Figure	Land Requirements Figure	N/A	Pre-application
5-Apr-21	Kwikwetlem First Nation	Email	Morgan Tanner, Hemmera	Craig Orr, KFN cc: Referrals, KFN Kiley Gibson, CP Joshua Jodoin, Hemmera	Morgan sent the Land Requirements Figure for KFN's review and comment and listed upcoming comment return dates for documents shared with KFN to date including: • Summary of Engagement • Marine Communications Plan; Navigational Impact Assessment • EEMP; Offsetting Plan • Species at Risk and Invasive Species Assessment • Land Requirements Figure	Land Requirements Figure	N/A	Pre-application
5-Apr-21	Musqueam Indian Band	Email	Morgan Tanner, Hemmera	Erin Larocque, MIB cc: Eliza Bethune, Hemmera	Morgan sent the Offsetting Plan to MIB and asked Erin to let her know if MIB had any comments or questions.	Offsetting Plan	N/A	Pre-application
6-Apr-21	Tsleil-Waututh Nation	Email	Morgan Tanner, Hemmera	Kate Menzies, TWN cc: Kiley Gibson, CP Referrals, TWN Joshua Jodoin, Hemmera	Morgan provided a brief overview of the Marine Construction and Staging Plan and attached a copy for TWN's review and comment. Morgan confirmed that CP was anticipating comments on this document before Monday, May 24, 2021 and reviewed upcoming comment return dates for other Project documents.	Marine Construction and Staging Plan	N/A	Pre-application



## Engagement Log

Date	Indigenous Community	Method	Sender/Attendee	Recipient	Description	Attachment(s)	Current Actions	Project Phase
8-Apr-21	Musqueam Indian Band	Email	Erin Larocque, MIB	Morgan Tanner, Hemmera cc: Kayla Phillips, MIB Eliza Bethune, Hemmera	Erin let Morgan know that Figures 1A to 4 in the Offsetting Plan were blank and asked Morgan to resend the Offsetting Plan.	N/A	N/A	Pre-application
8-Apr-21	Musqueam Indian Band	Email	Morgan Tanner, Hemmera	Erin Larocque, MIB cc: Kayla Phillips, MIB Eliza Bethune, Hemmera	Morgan confirmed that she had relayed the missing figures back to the project manager and hoped to get an updated PDF to MIB as soon as possible. Morgan asked if MIB could continue their review without the figures, and come back to those sections once the document has been updated.	N/A	N/A	Pre-application
9-Apr-21	Musqueam Indian Band	Email	Morgan Tanner, Hemmera	Erin Larocque, MIB cc: Kayla Phillips, MIB Eliza Bethune, Hemmera	Morgan resent the Offsetting Plan to MIB.	N/A	N/A	Pre-application
9-Apr-21	Musqueam Indian Band	Email	Erin Larocque, MIB	Morgan Tanner, Hemmera cc: Kayla Phillips, MIB Eliza Bethune, Hemmera	Erin thanked Morgan for resending the Offsetting Plan.	N/A	N/A	Pre-application
22-Apr-21	Tsleil-Waututh Nation	Email	Morgan Tanner, Hemmera	Kate Menzies, TWN cc: Kiley Gibson, CP Referrals, TWN	Morgan wished Kate and the TWN community well with the latest wave of restrictions and asked if there been a vaccination clinic for the TWN community. Morgan also checked in on how document review was coming for the Project.	N/A	N/A	Pre-application
22-Apr-21	Tsleil-Waututh Nation	Email	Kate Menzies, TWN	Morgan Tanner, Hemmera cc: Kiley Gibson, CP Referrals, TWN	Kate thanked Morgan for the email and confirmed that the TWN community had received their first round of vaccinations. TWN confirmed that they had no comments on the Summary of Engagement Report. Kate confirmed she had the other TWN comments for the remaining documents, just needed to find the time to put them together and send them off.	N/A	N/A	Pre-application
22-Apr-21	Tsleil-Waututh Nation	Email	Morgan Tanner, Hemmera	Kate Menzies, TWN cc: Kiley Gibson, CP Referrals, TWN	Morgan thanked Kate for the quick response and expressed her happiness to hear TWN had received their first round of vaccinations. Morgan also thanked Kate for confirming no comments on the Summary of Engagement Report and was looking forward to receiving the comments on other documents. Morgan offered Hemmera's support compiling TWN's comments on other documents, if needed.	N/A	N/A	Pre-application
22-Apr-21	Tsleil-Waututh Nation	Email	Kate Menzies, TWN	Morgan Tanner, Hemmera cc: Kiley Gibson, CP Referrals, TWN	Kate appreciated Morgan's offer to support compiling TWN's comments on other documents, and thinks they will be able to do it and send them over to Hemmera shortly.	N/A	N/A	Pre-application
22-Apr-21	Kwikwetlem First Nation	Email	Morgan Tanner, Hemmera	Sarah Prien, KFN Referrals, KFN cc: Craig Orr, KFN Robert Corman, KFN Joe Van Humbeck, CP Kiley Gibson, CP	Morgan noted that the Summary of Engagement Report is the only report CP has not received KFN comments on and asked if they should still be expecting comments. She confirmed the Summary of Engagement Report would be updated prior to the Port PER Submission, to summarize the themes and comments heard from the reviews of all other Project documents.	N/A	N/A	Pre-application
22-Apr-21	Kwikwetlem First Nation	Email	Morgan Tanner, Hemmera	Sarah Prien, KFN Referrals, KFN cc: Robert Corman, KFN Joe Van Humbeck, CP Kiley Gibson, CP	Morgan mentioned that the Summary of Engagement Report was the only report that Hemmera had not received comments, and she asked if Hemmera should be expecting comments.  Morgan also mentioned that Hemmera was going to update the Summary of Engagement Report, prior to the Port PER Submission, to summarize the themes and comments heard from the reviews of all other Project documents.	N/A	N/A	Pre-application
28-Apr-21	Kwikwetlem First Nation	Email	Morgan Tanner, Hemmera	Referrals, KFN cc: Robert Corman, KFN	Morgan mentioned that she was happy to hear review was underway. The Port PER Category C Application, as well as the FAA submission to DFO, are scheduled for submission the last week of May. Please let me know what I can do to support your review of the funding letters, or the engagement summary.  Cheers,	Project footprint map	N/A	Pre-application

## Engagement Log

Date	Indigenous Community	Method	Sender/Attendee	Recipient	Description	Attachment(s)	Current Actions	Project Phase
28-Apr-21	Kwikwetlem First Nation	Email	Referrals, KFN	Morgan Tanner, Hemmera cc: Robert Corman, KFN Referrals, KFN	<p>Sarah, thanked Morgan for following up, and she asked to be reminded when the Port PER was due to be submitted.</p> <p>Sarah, also mentioned that she looked at the Engagement Summary document (56 pages!) and reviewed the consultation with the KFN to date, which began April 9, 2020. Sarah, noted that the Engagement summary confirms CP Rail's commitment to consultation with the Nation and the details of the engagement over the last year. Sarah also mentioned that, it showed Craig, Nicole and Matt's continued involvement and that she was going to forward it to them today for review. Sarah also mentioned that the KFN was going to have a dinner to get feedback from the KFN team.</p> <p>Sarah also noted that the proposed capacity agreement between CPR and KFN was under internal review and that KFN was working hard to get this, and the comments on the Engagement Summary back to Hemmera as soon as possible.</p>	N/A	N/A	Pre-application
3-May-21	Tsleil-Waututh Nation	Email	Kate Menzies, TWN	Morgan Tanner, Hemmera	Kate provided TWN's comments on the CEMP as well as the comment tracking form for the AEA. Kate asked if a subsequent draft of the CEMP will be shared with TWN as there were no figures or appendices. Kate confirmed that TWN did not have any comments on the Navigational Impact Assessment or the Marine Communications Plan. She shared that TWN was working on their Offsetting Plan comments.	N/A	N/A	Pre-application
5-May-21	Tsleil-Waututh Nation	Email	Morgan Tanner, Hemmera	Kate Menzies, TWN	Morgan confirmed that the CEMP will be shared again prior to construction and apologized that there weren't appendices or figures. Noted that TWN had no comments on the Navigational Impact Assessment or Marine Communications Plan. Morgan said CP hoped to submit the application to the Port and DFO in early June and would like to set a meeting to discuss the Offsetting Plan including TWN comments, what was submitted, and next steps in late-June. Morgan asked if this worked for Kate's team and noted documents that were still awaiting responses from TWN.	N/A	N/A	Pre-application
5-May-21	Tsleil-Waututh Nation	Email	Kate Menzies, TWN	Morgan Tanner, Hemmera	Kate thanked Morgan for her email and said she would await the CEMP appendices and figures. Kate noted the Offsetting Plan also did not include a map or description of the area where offsetting would occur and asked that this information be sent to TWN. Kate said TWN may need more time to submit comments as they are waiting to meet with their biologist.	N/A	N/A	Pre-application
6-May-21	Tsleil-Waututh Nation	Email	Morgan Tanner, Hemmera	Kate Menzies, TWN	Morgan shared the CEMP with figures/appendices. Morgan asked if she should hold off on advancing TWN's comments so they have an opportunity to review the figures and appendices.	CEMP	N/A	Pre-application
6-May-21	Tsleil-Waututh Nation	Email	Morgan Tanner, Hemmera	Kate Menzies, TWN	Morgan explained the CEMP was too big to send via email and shared the CEMP via drop-file link.	N/A	N/A	Pre-application
6-May-21	Tsleil-Waututh Nation	Email	Kate Menzies, TWN	Morgan Tanner, Hemmera	Kate confirmed receiving Morgan's email with the link and said Morgan should hold off on advancing TWN's comments. Kate said TWN would review the CEMP and then provide any additional comments.	N/A	N/A	Pre-application
6-May-21	Tsleil-Waututh Nation	Email	Morgan Tanner, Hemmera	Kate Menzies, TWN	Morgan asked Kate if TWN could send comments on the updated CEMP by the following Friday.	N/A	N/A	Pre-application
11-May-21	Musqueam Indian Band	Email	Erin Larocque, MIB	Morgan Tanner, Hemmera cc: Kayla Phillips, MIB	Erin said MIB had comments on the draft Offsetting Plan and asked for the Project timeline and if it was feasible to set aside time to meet.	N/A	N/A	Pre-application
11-May-21	Musqueam Indian Band	Email	Morgan Tanner, Hemmera	Erin Larocque, MIB cc: Kayla Phillips, MIB	Morgan said CP's the Port PER Category C submission was targeted for the end of the month and DFO FAA submission was targeted for the end of the month.	N/A	N/A	Pre-application
12-May-21	Musqueam Indian Band	Email	Kayla Phillips, MIB	Morgan Tanner, Hemmera Erin Larocque, MIB	Kayla shared MIB's comments on the Offsetting Plan. MIB expressed interest in being fully involved with the Project and would like to set up a meeting to discuss the Project and offsetting in particular.	MIB Offsetting Plan Comments	N/A	Pre-application
14-May-21	Musqueam Indian Band	Email	Morgan Tanner, Hemmera	Kayla Phillips, MIB Erin Larocque, MIB	Morgan thanked Kayla for sending MIB's comments on the Offsetting Plan and confirmed CP is starting to reply to those comments. Morgan confirmed CP will set up a meeting to discuss the Project and related offsetting. Morgan suggested meeting dates.	N/A	N/A	Pre-application
14-May-21	Musqueam Indian Band	Email	Kayla Phillips, MIB	Morgan Tanner, Hemmera Erin Larocque, MIB	Kayla requested Morgan send a couple of meeting time options.	N/A	N/A	Pre-application

### Engagement Log

Date	Indigenous Community	Method	Sender/Attendee	Recipient	Description	Attachment(s)	Current Actions	Project Phase
16-May-21	Tsleil-Waututh Nation	Email	Kate Menzies, TWN	Morgan Tanner, Hemmera	Kate submitted TWN's CEMP comments and noted they needed a few more days to put together comments on the Offsetting Plan.	TWN's CEMP Comments	N/A	Pre-application
17-May-21	Musqueam Indian Band	Email	Morgan Tanner, Hemmera	Kayla Phillips, MIB Erin Larocque, MIB	Morgan said she would be in touch with meeting dates and times once she heard back from her team.	N/A	N/A	Pre-application
17-May-21	Tsleil-Waututh Nation	Email	Morgan Tanner, Hemmera	Kate Menzies, TWN	Morgan asked if Kate could send the Offsetting Plan comments by Tuesday in order to wrap up permitting by the end of the month.	N/A	N/A	Pre-application
17-May-21	Tsleil-Waututh Nation	Email	Kate Menzies, TWN	Morgan Tanner, Hemmera	Kate said she would do her best to get the comments to Morgan by Tuesday.	N/A	N/A	Pre-application
18-May-21	Tsleil-Waututh Nation	Email	Morgan Tanner, Hemmera	Kate Menzies, TWN	Morgan checked in to see how long it would be before receiving TWN's Offsetting Plan comments so she can give some feedback to the CP/Hemmera team on when they can expect to start diving in.	N/A	N/A	Pre-application
18-May-21	Tsleil-Waututh Nation	Email	Kate Menzies, TWN	Morgan Tanner, Hemmera	Kate said she would send the comments later that day. She also noted there were a couple of outstanding comments TWN wanted to provide comments on, but they were unable to meet with their biologist until later in the week or the following week.	N/A	N/A	Pre-application
18-May-21	Tsleil-Waututh Nation	Email	Morgan Tanner, Hemmera	Kate Menzies, TWN	Morgan said it sounded good if TWN sent most comments that day and few comments later that week or the following week.	N/A	N/A	Pre-application
18-May-21	Tsleil-Waututh Nation	Email	Kate Menzies, TWN	Morgan Tanner, Hemmera	Kate thanked Morgan for patience on this. Attached were TWN's comments on the Offsetting Plan. Kate noted TWN was awaiting final comments from their environmental team and would send them as soon as they could.	TWN's Offsetting Plan Comments	N/A	Pre-application
19-May-21	Tsleil-Waututh Nation	Email	Morgan Tanner, Hemmera	Kate Menzies, TWN	Morgan thanked Kate and said she'll look for TWN's other comments.	N/A	N/A	Pre-application
25-May-21	Musqueam Indian Band	Email	Morgan Tanner, Hemmera	Kayla Phillips, MIB Erin Larocque, MIB	Morgan asked if MIB was available to meet during any of the listed meeting dates/times to discuss the Project.	N/A	N/A	Pre-application
25-May-21	Musqueam Indian Band	Email	Kayla Phillips, MIB	Morgan Tanner, Hemmera Erin Larocque, MIB	Kayla asked if Hemmera/CP could tentatively book a meeting on June 11th.	N/A	N/A	Pre-application
25-May-21	Musqueam Indian Band	Email	Morgan Tanner, Hemmera	Kayla Phillips, MIB Erin Larocque, MIB Joe Van Humbeck, CP Kiley Gibson, CP Tim Edgell, Hemmera Joe Walker, Hemmera Trevor Welton, Hemmera	Morgan sent out a meeting invite for June 11, 2021 from 1 to 2:30 pm to discuss the Offsetting Plan, nothing CP will provide the presentation and that this would be the first meeting regarding Offsetting discussion in detail. Morgan said she understood Kayla and Erin are confirming if this date/time works for the Musqueam team, and suggested she forward the invite to the team as required and to please let Morgan know if they have any specific questions or would like to discuss anything not captured in Musqueam's review comments (attached).	MIB Offsetting Plan Comments	N/A	Pre-application
26-May-21	Tsleil-Waututh Nation	Email	Kate Menzies, TWN	Morgan Tanner, Hemmera	Kate shared TWN's comments on the Species at Risk and Invasive Species Assessments and Vegetation Overview Plan Report. Kate asked if there will be further ground-truthing surveys and a final draft to be submitted since the plan included only desktop research.	TWN's Species at Risk and Invasive Species Assessments Comments, TWN's Vegetation Overview Plan Report Comments	N/A	Pre-application
26-May-21	Tsleil-Waututh Nation	Email	Morgan Tanner, Hemmera	Kate Menzies, TWN	Morgan thanked Kate for TWN's comments and said she touched base with the project manager, and he indicated that they will need all comments by noon on May 27, 2021 in order for them to be incorporated into the application submissions (the Port Cat C and DFO FAA). Morgan confirmed CP was awaiting TWN comments on a few reports and asked if there was an estimated time when these comments would be received. Morgan confirmed the Offsetting Plan and the Marine Construction and Staging Plan will be finalized once offsetting/construction is closer to starting (i.e., what gets submitted to the regulator isn't set in stone). Morgan said if TWN is interested and available CP/Hemmera can meet with TWN throughout the application review process to discuss details around offsetting, etc. Morgan said CP will continue communications and meetings as/when requested by any Indigenous community and relay comments from those conversations to the regulator to make sure they are considered and incorporated into regulator's review.	N/A	N/A	Pre-application
26-May-21	Tsleil-Waututh Nation	Email	Kate Menzies, TWN	Morgan Tanner, Hemmera	Kate thanked Morgan for the information and said TWN would not have the comments from their biologist by May 27, 2021 and will have to provide that feedback in their permit reviews. Kate confirmed TWN had no comments on the Land Requirements PDF and the Marine Construction and Staging Plan.	N/A	N/A	Pre-application



## Engagement Log

Date	Indigenous Community	Method	Sender/Attendee	Recipient	Description	Attachment(s)	Current Actions	Project Phase
26-May-21	Tsleil-Waututh Nation	Email	Morgan Tanner, Hemmera	Kate Menzies, TWN	Morgan apologized for the late notice on the timing and said she thought they had another week. Morgan confirmed TWN's preliminary comments will be responded to/incorporated prior to submission. Morgan asked if TWN would like to have a meeting mid-June to discuss the offsetting concept and application submission.	N/A	N/A	Pre-application
26-May-21	Tsleil-Waututh Nation	Email	Kate Menzies, TWN	Morgan Tanner, Hemmera	Kate thanked Morgan for acknowledging the very constrained timing window and said TWN looked forward to seeing how their comments were incorporated into the submission. Kate said TWN would prefer to wait until they have submitted final comments on the Offsetting Plan to give Hemmera/CP time to review their responses, prior to confirming a meeting. Kate said she was trying to limit TWN's time in meetings to issues resolution/discussion and clarification around responses.	N/A	N/A	Pre-application
31-May-21	Kwikwetlem First Nation	Email	Morgan Tanner, Hemmera	Client, CPR Rail  Sarah Prien, KFN Robert Corman, KFN Referrals, KFN cc: Joe Van Humbeck, CP Mike LoVecchio, CP	asked for confirmation on the following items: Morgan asked if the draft funding letter that was shared on April 9 is still in the hands of the Kwikwetlem team. Morgan also asked about the documents that were shared on April 5 and requested the Kwikwetlem team to please send their comments by May 21. Morgan informed that CP is proposing to construct a multi-modal, multi-commodity transload and logistics facility adjacent to its Vancouver Intermodal Facility in Pitt Meadows, British Columbia. The Project is being put forward to meet CP's regulatory obligation to handle the projected increased rail demand anticipated in Canada's largest trade gateway. The CPLPV Project remains on schedule to submit an application to the Canadian Transportation Agency for approval pursuant to Section 98 of the Canada Transportation Act before December 25, 2021.  Morgan also mentioned that a draft Terms of Reference (TOR) has recently been published, which can be found on the Project's Consultation and Engagement webpage. Morgan noted that if Kwikwetlem would like to review this document, Hemmera would anticipate comments on or before July 15, 2021.  Morgan also mentioned that CP is about to kick-off the second round of Public Engagement that will last for three weeks in June. If there is interest, the Kwikwetlem First Nation community was invited to participate in the open houses scheduled for June 8, June 16, and June 24. The open houses provided information on the technical and environmental studies for the Project, including potential mitigation approaches. Morgan also noted that there is also an opportunity to sign up for Project updates.	Project footprint map	N/A	Pre-application
31-May-21	Tsleil-Waututh Nation	Email	Morgan Tanner, Hemmera	Kate Menzies, TWN	Morgan, asked Kate to let her know when the TWN team wanted to meet next week. Morgan also noted that the dates proposed by TWH made sense to her and that she was going to touch base after the submission.	N/A	N/A	Pre-application
3-Jun-21	Kwikwetlem First Nation	Email	Sarah Prien, KFN	Morgan Tanner, Hemmera cc: Robert Corman, KFN Craig Orr, KFN Cassandra Harper, KFN	Sarah informed that Cassandra Harper was new to the Referrals Team and that she was assigned to CP projects. Sarah provided an overview of Cassandra's professional credentials and thanked Morgan for her patience and support to ensure adequate consultation and engagement with KFN on these projects.	N/A	N/A	Pre-application
7-Jun-21	Kwikwetlem First Nation	Email	Cassandra Harper, KFN	Morgan Tanner, Hemmera cc: Referrals, KFN	Cassandra thanked Morgan for welcoming her. Cassandra also mentioned that Craig did much of the review of Cascadia Phase 4 and asked for confirmation to make sure that there are no outstanding responses for this project, other than a meeting to review the changes made to the Offsetting Plan. Cassandra asked Morgan to provide the final copies of the FAA application to DFO and the PER application to the Port for KFN's records.	N/A	N/A	Post-application

## Engagement Log

Date	Indigenous Community	Method	Sender/Attendee	Recipient	Description	Attachment(s)	Current Actions	Project Phase
7-Jun-21	Kwikwetlem First Nation	Email	Morgan Tanner, Hemmera	Sarah Prien, KFN cc: Robert Corman, KFN Referrals, KFN Cassandra Harper, KFN Katherine Zilm, Hemmera	Morgan provided an update on several CP projects and noted she would send a specific meeting request to KFN to discuss Cascadia Phase 4.	N/A	N/A	Post-application
7-Jun-21	Kwikwetlem First Nation	Email	Morgan Tanner, Hemmera	Craig Orr, KFN Cassandra Harper, KFN cc: Robert Corman, KFN Referrals, KFN	Morgan noted that CP submitted both the FAA Application to DFO as well as the PER Application to the Port on Friday June 4, 2021. Morgan also told the KFN's team to let her know if they would like a copy of the submitted documents. Morgan also mentioned that per the Offsetting Plan, during design and final habitat balancing, a number of changes were made to the offsetting habitat size and configuration. Morgan mentioned that Hemmera wanted to present these changes and answer any questions. Additionally, she attached CP's responses to KFN comments on the multiple documents KFN reviewed.	Ph4_KFNComments.xlsx	N/A	Post-application
7-Jun-21	Tsleil-Waututh Nation	Email	Morgan Tanner, Hemmera	Kate Menzies, TWN	Morgan noted that CP submitted both the FAA Application to DFO as well as the PER Application to the Port on Friday June 4. Morgan also told the TWN's team to let her know if they would like a copy of the submitted documents. Morgan also mentioned that per the Offsetting Plan, during design and final habitat balancing, a number of changes were made to the offsetting habitat size and configuration. Morgan mentioned that Hemmera wanted to present these changes and answer any questions. Additionally, she attached CP's responses to KFN comments on the multiple documents TWN reviewed.	N/A	N/A	Post-application
7-Jun-21	Tsleil-Waututh Nation	Email	Morgan Tanner, Hemmera	Kate Menzies, TWN	Morgan noted that CP submitted both the FAA Application to DFO as well as the PER Application to the Port on Friday June 4. Morgan also told the TWN's team to let her know if they would like a copy of the submitted documents. Morgan also mentioned that per the Offsetting Plan, during design and final habitat balancing, a number of changes were made to the offsetting habitat size and configuration. Morgan mentioned that Hemmera wanted to present these changes and answer any questions. Additionally, she attached CP's responses to TWN comments on the multiple documents TWN reviewed. Morgan also asked when Kate was available to meet to discuss the submission, the updated Offsetting Plan, and any comment/responses on reviewed documents.	Ph4_TWNComments.xlsx	N/A	Post-application
7-Jun-21	Musqueam Indian Band	Email	Morgan Tanner, Hemmera	Kayla Phillips, MIB Erin Larocque, MIB	Morgan noted that CP submitted both the FAA Application to DFO as well as the PER Application to the Port on Friday June 4. Morgan also told the MIB's team to let her know if they would like a copy of the submitted documents. Morgan also mentioned that per the Offsetting Plan, during design and final habitat balancing, a number of changes were made to the offsetting habitat size and configuration. Morgan mentioned that Hemmera wanted to present these changes and answer any questions. Additionally, she attached CP's responses to MIB comments on the Offsetting Plan and she mentioned that they could discuss them in their Friday meeting. Morgan also included a draft of the Friday meeting agenda.	MIB Offsetting Plan Comment Responses	N/A	Post-application
8-Jun-21	Kwikwetlem First Nation	Email	Morgan Tanner, Hemmera	Cassandra Harper, KFN cc: Referrals, KFN Katherine Zilm, Hemmera	Morgan mentioned that Craig had already done all of the reviews of Cascadia Phase 4, and the only outstanding comments were those on the draft engagement summary. Morgan also reported that Sarah was trying to review the summary, but she wasn't aware of her progress. Morgan also mentioned that it was likely that she would have to upload the final applications to Hemmera's FTP site (due to size) and that she was going to share them with the Kwikwetlem team the next day.			Post-application
9-Jun-21	Kwikwetlem First Nation	Email	Morgan Tanner, Hemmera	Cassandra Harper, KFN cc: Referrals, KFN	Morgan informed Cassandra that she should receive an email from Hemmera File Drop with links to the Cascadia Phase 4 FAA Application to DFO and Cascadia Phase 4 Cat C PER Application to the Port.	Cascadia Phase 4 FAA and PER Applications	N/A	Post-application

## Engagement Log

Date	Indigenous Community	Method	Sender/Attendee	Recipient	Description	Attachment(s)	Current Actions	Project Phase
11-Jun-21	Musqueam Indian Band	Meeting	Erin LaRocque, MIB Kayla Phillips, MIB Morgan Guerin, MIB Kiley Gibson, CP Trevor Welton, Hemmera Tim Edgell, Hemmera Morgan Tanner, Hemmera	N/A	CP/ Hemmera met with the MIB to discuss Offsetting Concept details, comment responses, and regulatory schedules.	N/A	Morgan and Erin to follow-up directly to discuss next steps including capacity funding, comment-response review, and engagement efficiencies.	Post-application
14-Jun-21	Squamish Nation	Email	Morgan Tanner, Hemmera	Aaron Marchant, SN	Morgan, noted that CP submitted both the FAA Application to DFO as well as the PER Application to the Port on Friday June 4. Morgan also told the SN's team to let her know if they would like a copy of the submitted documents. Morgan also mentioned that the Chance Find Procedure was going to be provided in the updated CEMP (which will be updated prior to construction).	N/A	N/A	Post-application
14-Jun-21	Musqueam Indian Band	Email	Morgan Tanner, Hemmera	Kayla Phillips, MIB Erin Laroque, MIB Morgan Guerin, MIB cc: Trevor Welton, Hemmera Kiley Gibson, CP	Morgan thanked the MIB team for meeting last week, said it was a good conversation, and looked forward to the next. Morgan attached the Offsetting Plan which was submitted to the Port and DFO on June 4, 2021, as well as the slides from last week updated to show the proposed offsetting area in relation to the Project area. Morgan said she would send the draft minutes when ready with the actions discussed highlighted.	Updated Offsetting Plan 2021-June-11 MIB Meeting Updated PPT	N/A	Post-application
24-Jun-21	Musqueam Indian Band	Email	Morgan Tanner, Hemmera	Kayla Phillips, MIB Morgan Guerin, MIB Erin Laroque, MIB cc: Kiley Gibson, CP	Morgan thanked MIB for their time on June 11, 2021. She attached the draft meeting minutes and presentation for review and feedback, and shared some action items.	2021-June-11 MIB Meeting Minutes 2021-June-11 MIB Meeting PPT	1. Tim to review MIB's Offsetting comment-responses and ensure that information was added to the updated Offsetting Plan and update the comment-response sheet as required. 2. Morgan and Erin to follow-up directly to discuss next steps including capacity funding, comment-response review, and engagement efficiencies. 3. Morgan to send Erin, Kayla and Morgan G. the updated Offsetting Plan.	Post-application
25-Jun-21	Cowichan Tribes	Email	Eliza Bethune, Hemmera	CT cc: Eamon Gaunt, CT Natalie Anderson, CT Candace Charlie, CT Morgan Tanner, Hemmera	Eliza initially acknowledged that it had been some time since the last communications regarding Cascadia Phase 4. Subsequently, Eliza commented that Hemmera wanted to confirm that CP had submitted a Category C PER Application to the Vancouver Fraser the Port and a Fisheries Act Application to Fisheries and Oceans Canada. Eliza reported that CP submitted these applications on June 4, 2021 and that both applications were in the review process. Eliza also mentioned that by the time the review process was completed, CP anticipated that both DFO and the Port would begin consultations. Eliza also offered her support if the CT's team needed anything from CP or if they wanted to set up a meeting, share information or clarify any questions they may have regarding the Project.	N/A	N/A	Post-application
25-Jun-21	Stz'uminus First Nation	Email	Eliza Bethune, Hemmera	Ronda Jordan, SFN cc: Morgan Tanner, Hemmera	Eliza initially acknowledged that it had been some time since the last communications regarding Cascadia Phase 4. Subsequently, Eliza commented that Hemmera wanted to confirm that CP had submitted a Category C PER Application to the Vancouver Fraser the Port and a Fisheries Act Application to Fisheries and Oceans Canada. Eliza reported that CP submitted these applications on June 4, 2021 and that both applications were in the review process. Eliza also mentioned that by the time the review process was completed, CP anticipated that both DFO and the Port would begin consultations. Eliza also offered her support if the SFN's team needed anything or if they wanted to set up a meeting, share information or clarify any questions they may have regarding the Project.	N/A	N/A	Post-application



## Engagement Log

Date	Indigenous Community	Method	Sender/Attendee	Recipient	Description	Attachment(s)	Current Actions	Project Phase
25-Jun-21	Lyackson First Nation	Email	Eliza Bethune, Hemmera	Reception, TWN cc: Morgan Tanner, Hemmera	Eliza initially acknowledged that it had been some time since the last communications regarding Cascadia Phase 4. Subsequently, Eliza commented that Hemmera wanted to confirm that CP had submitted a Category C PER Application to the Vancouver Fraser the Port and a Fisheries Act Application to Fisheries and Oceans Canada. Eliza reported that CP submitted these applications on June 4 and that both applications were in the review process. Eliza also mentioned that by the time the review process was completed, CP anticipated that both DFO and the Port would begin consultations. Eliza also offered her support if the LFN's team needed anything or if they wanted to set up a meeting, share information or clarify any questions they may have regarding the Project.	N/A	N/A	Post-application
25-Jun-21	Lake Cowichan First Nation	Email	Eliza Bethune, Hemmera	Carole Livingstone, LCFN cc: Morgan Tanner, Hemmera	Eliza initially acknowledged that it had been some time since the last communications regarding Cascadia Phase 4. Subsequently, Eliza commented that Hemmera wanted to confirm that CP had submitted a Category C PER Application to the Vancouver Fraser the Port and a Fisheries Act Application to Fisheries and Oceans Canada. Eliza reported that CP submitted these applications on June 4, 2021 and that both applications were in the review process. Eliza also mentioned that by the time the review process was completed, CP anticipated that both DFO and the Port would begin consultations. Eliza also offered her support if LCFN's team needed anything or if they wanted to set up a meeting, share information or clarify any questions they may have regarding the Project.	N/A	N/A	Post-application
25-Jun-21	Seabird Island Band	Email	Eliza Bethune, Hemmera	D Gabriel, SIB cc: Morgan Tanner, Hemmera	Eliza initially acknowledged that it had been some time since the last communications regarding Cascadia Phase 4. Subsequently, Eliza commented that Hemmera wanted to confirm that CP had submitted a Category C PER Application to the Vancouver Fraser the Port and a Fisheries Act Application to Fisheries and Oceans Canada. Eliza reported that CP submitted these applications on June 4, 2021 and that both applications were in the review process. Eliza also mentioned that by the time the review process was completed, CP anticipated that both DFO and the Port would begin consultations. Eliza also offered her support if SIB's team needed anything or if they wanted to set up a meeting, share information or clarify any questions they may have regarding the Project.	N/A	N/A	Post-application
25-Jun-21	Kwikwetlem First Nation	Meeting	Kiley Gibson, CP Cassandra Harper, KFN Craig Orr, KFN Tim Edgell, Hemmera Trevor Welton, Hemmera Enrico Barbon, Hemmera Morgan Tanner, Hemmera Hana Val, Hemmera	N/A	CP/Hemmera met with KFN to discuss several CP projects including Cascadia Phase 4.	N/A	<ol style="list-style-type: none"> <li>1. CP and KFN to revisit the kelp monitoring discussion, specifically whether a 5-year monitoring program (common with FAAs) is sufficient to monitor site colonization</li> <li>2. CP to share offsetting construction cost projections with KFN when they are available.</li> <li>3. CP and KFN to revisit other potential opportunities for additional offsetting.</li> </ol>	Post-application
25-Jun-21	Penelakut Tribe	Email	Eliza Bethune, Hemmera	Denise, PT	Eliza noted that CP submitted both the FAA Application to DFO as well as the PER Application to the Port on Friday June 4, 2021. Once the permits are through the completeness review, CP anticipates both DFO and the Port will begin consultations. Eliza said that if Denise requires anything from CP, to please let Eliza know and she can organize a meeting, share information, or clarify any questions you may have regarding the Project.	N/A	N/A	Post-application
25-Jun-21	Halalt First Nation	Email	Eliza Bethune, Hemmera	Raven August, HFN	Eliza noted that CP submitted both the FAA Application to DFO as well as the PER Application to the Port on Friday June 4, 2021. Once the permits are through the completeness review, CP anticipates both DFO and the Port will begin consultations. Eliza said that if Raven requires anything from CP, to please let Eliza know and she can organize a meeting, share information, or clarify any questions you may have regarding the Project.	N/A	N/A	Post-application

## Engagement Log

Date	Indigenous Community	Method	Sender/Attendee	Recipient	Description	Attachment(s)	Current Actions	Project Phase
30-Jun-21	Seabird Island Band	Email	Eliza Bethune, Hemmera	Referrals, SIB	Eliza initially acknowledged that it had been some time since the last communications regarding Cascadia Phase 4. Subsequently, Eliza commented that Hemmera wanted to confirm that CP had submitted a Category C PER Application to the Vancouver Fraser the Port and a Fisheries Act Application to Fisheries and Oceans Canada. Eliza reported that CP submitted these applications on June 4, 2021 and that both applications were in the review process. Eliza also mentioned that by the time the review process was completed, CP anticipated that both DFO and the Port would begin consultations. Eliza also offered her support if SIB's team needed anything or if they wanted to set up a meeting, share information or clarify any questions they may have regarding the Project.	N/A	N/A	Post-application
30-Jun-21	Tsleil-Waututh Nation	Email	Morgan Tanner, Hemmera	Kate Menzies, TWN	Morgan apologized for her late response and she attached some written text, and a specific portion of the presentation showing a summary of the Offsetting Plan updates.	N/A	N/A	Post-application
12-Jul-21	Tsleil-Waututh Nation	Email	Kate Menzies, TWN	Morgan Tanner, Hemmera	Kate thanked Morgan for her email and mentioned that she did not answer before because she was on vacation. Kate also mentioned that the TWN was going to review the table and get back to you with any further comments/questions. Kate also asked for a summary of the changes to the habitat compensation plan and asked Morgan if Hemmera could send this summary to her before the meeting. Additionally, Sarah mentioned that she was not sure when she would be able to coordinate a meeting soon given the team's schedules over the next few weeks and that it would be helpful to take a look at the summary before the meeting.	N/A	N/A	Post-application
16-Jul-21	Tsleil-Waututh Nation	Email	Kate Menzies, TWN	Morgan Tanner, Hemmera	Kate thanked Morgan for sharing written text and a specific portion of the presentation showing a summary of the Offsetting Plan updates. Kate also mentioned that she was going to take a look and get back with comments.	N/A	N/A	Post-application
12-Oct-21	Kwikwetlem First Nation	Meeting	Cassandra Harper, KFN Craig Orr, KFN Kyle Robertson, KFN Joe Van Humbeck, CP Mike LoVecchio, CP Morgan Tanner, Hemmera Eliza Bethune, Hemmera	N/A	High-level discussion of Cascadia Phase 4 and upcoming work and actions.	N/A	<ol style="list-style-type: none"> <li>1. CP and KFN to revisit the kelp monitoring discussion, specifically whether a 5-year monitoring program (common with FAAs) is sufficient to monitor site colonization</li> <li>2. CP to share offsetting construction cost projections with KFN when they are available.</li> <li>3. CP and Kwikwetlem to revisit other potential opportunities for additional offsetting.</li> <li>4. CP to inform KFN of dive survey timelines/information as well as updates from discussions had with the Port regarding offsetting.</li> <li>5. Hemmera to liaise with KFN to confirm how to reduce document review efforts.</li> </ol>	Post-application
12-Nov-21	Kwikwetlem First Nation	Email	Cassandra Harper, KFN	Morgan Tanner, Hemmera cc: Sarah Prien, KFN Referrals, KFN	Cassandra thanked Morgan for meeting that day. Cassandra confirmed that she has email correspondence that implies Nicole was in discussions with Terra Archaeology regarding the AIA. She noted that KFN will discuss their records internally for meetings attended and asked Morgan if she could send any records she may have, as the only meetings they were able to confirm today were the Cascadia Phase 4 offsetting activities. Cassandra added a list of additional meetings she has on file.	N/A	N/A	Post-application
14-Nov-21	Kwikwetlem First Nation	Email	Morgan Tanner, Hemmera	Cassandra Harper, KFN cc: Sarah Prien, KFN Referrals, KFN	Morgan thanked Cassandra for the update and attached a meeting matrix detailing all the meetings between CP/Hemmera and KFN by project. Morgan asked Cassandra to let her know if her records do not match up. Morgan confirmed that Cassandra's records for the AIA can confirm comments were provided.	Kwikwetlem-CP Meeting Matrix	N/A	Post-application

## Engagement Log

Date	Indigenous Community	Method	Sender/Attendee	Recipient	Description	Attachment(s)	Current Actions	Project Phase
15-Nov-21	Kwikwetlem First Nation	Email	Morgan Tanner, Hemmera	Cassandra Harper, KFN cc: Sarah Prien, KFN Referrals, KFN	Morgan shared the October 12, 2021 draft meeting minutes for Kwikwetlem First Nation's review and edits, as well as listing out action items from the meeting and outstanding actions from Hemmera's collective notes.	2021-Oct-12 Kwikwetlem Draft Meeting Minutes	<ol style="list-style-type: none"> <li>1. CP and KFN to revisit the kelp monitoring discussion, specifically whether a 5-year monitoring program (common with FAAs) is sufficient to monitor site colonization</li> <li>2. CP to share offsetting construction cost projections with Kwikwetlem First Nation when they are available.</li> <li>3. CP and KFN to revisit other potential opportunities for additional offsetting.</li> <li>4. CP to inform KFN of dive survey timelines/information as well as updates from discussions had with the Port regarding offsetting.</li> <li>5. Hemmera to liaise with KFN to confirm how to reduce document review efforts.</li> </ol>	Post-application
20-Jan-22	Musqueam Indian Band	Email	Morgan Tanner, Hemmera	Kayla Phillips, MIB Erin Larocque, MIB Morgan Guerin, MIB cc: Kiley Gibson, CP Joe Walker, Hemmera Eliza Bethune, Hemmera	Morgan provided MIB with updates on the Project, specifically about the Port PER Category C Permit and FAA Applications in June 2021. Morgan explained that after resubmission, the Port informed CP the proposed offsetting location could no longer be used and after further discussion, two potential new offsetting locations were selected for further study: Berry Point and Barnet Marine Park. Morgan noted that the proposed habitat offsetting design shared with the MIB has not changed. Morgan said CP considers Berry Point favourable for replicating this offsetting design previously reviewed, and is waiting to hear back from Shellburn Terminal that the proposed offsetting will not adversely impact Shellburn's ongoing infrastructure or operations. Morgan said CP plans to resubmit the PER Category C Permit Application and FAA Application on February 11 ,2021, including a revised Offsetting Plan, which will be available for review and comment on February 4, 2022. Morgan apologized as this does not meet the 45-day review period that CP has been able to provide on pervious projects and for other documents on the project. Morgan invited MIB to meet with CP/Hemmera any time from now to February 11, 2022 to go through the changes together and get their comments. Morgan attached an overview of the Offsetting Plan, concept, and habitat that has been discussed to-date. Morgan added that she will be handing off engagement support activities to Eliza Bethune, but will continue to monitor the Project, connect with CP directly, and will always be here if Kayla, Erin, or anyone from MIB wanted to connect.	Offsetting Overview PPT Suggested Offsetting Locations	N/A	Post-application
20-Jan-22	Kwikwetlem First Nation	Email	Morgan Tanner, Hemmera	Cassandra Harper, KFN Craig Orr, KFN Referrals, KFN cc: Kiley Gibson, CP Joe Walker, Hemmera Eliza Bethune, Hemmera	Morgan provided the KFN with updates on the Project, specifically about the Port PER Category C Permit and FAA Applications in June 2021. Morgan explained that after resubmission, the Port informed CP the proposed offsetting location could no longer be used and after further discussion, two potential new offsetting locations were selected for further study: Berry Point and Barnet Marine Park. Morgan noted that the proposed habitat offsetting design previously shared has not changed. Morgan said CP considers Berry Point favourable for replicating the offsetting design previously reviewed, and is waiting to hear back from Shellburn Terminal that the proposed offsetting will not adversely impact Shellburn's ongoing infrastructure or operations. Morgan said CP plans to resubmit the PER Category C Permit Application and FAA Application on February 11 ,2021, including a revised Offsetting Plan, which will be available for review and comment on February 4, 2022. Morgan apologized as this does not meet the 45-day review period that CP has been able to provide on pervious projects and for other documents on the project. Morgan invited the KFN to meet with CP/Hemmera any time from now to February 11, 2022 to go through the changes together and get their comments. Morgan attached an overview of the Offsetting Plan, concept, and habitat that has been discussed to-date. Morgan added that she will be handing off engagement support activities to Eliza Bethune, but will continue to monitor the Project, connect with CP directly, and will always be here if Cassandra, Craig, or anyone from the KFN want to connect.	Offsetting Overview PPT Suggested Offsetting Locations 211206 Offsetting Habitat Locations Survey Final	N/A	Post-application



### Engagement Log

Date	Indigenous Community	Method	Sender/Attendee	Recipient	Description	Attachment(s)	Current Actions	Project Phase
25-Jan-22	Kwkwetlem First Nation	Email	Craig Orr, KFN	Morgan Tanner, Hemmera Cassandra Harper, KFN cc: Kiley Gibson, CP Joe Walker, Hemmera Eliza Bethune, Hemmera Referrals, KFN	Craig thanked Morgan and Eliza for the information and asked to be let know when the consideration of Berry Point is finalized. He noted that February 4 is fast approaching and Kwkwetlem First Nation will do all they can to review the latest Offsetting Plan in a timely fashion. He said they are still keen to see meaningful habitat work done in the Burrard Inlet, and would confer with the team to see if they need a meeting.	N/A	N/A	Post-application
25-Jan-22	Squamish Nation	Squamish Connect	Morgan Tanner, Hemmera	Aaron Marchant, SN	Morgan provided the SN with updates on the Project, specifically about the Port PER Category C Permit and FAA Applications in June 2021. Morgan explained that after resubmission, the Port informed CP the proposed offsetting location could no longer be used and after further discussion, two potential new offsetting locations were selected for further study: Berry Point and Barnet Marine Park. Morgan noted that the proposed habitat offsetting design previously shared has not changed. Morgan said CP considers Berry Point favourable for replicating the offsetting design previously shared, and is waiting to hear back from Shellburn Terminal that the proposed offsetting will not adversely impact Shellburn's ongoing infrastructure or operations. Morgan said CP plans to resubmit the PER Category C Permit Application and FAA Application on February 11, 2021, including a revised Offsetting Plan, which will be available for review and comment on February 4, 2022. Morgan apologized as this does not meet the 45-day review period that CP has been able to provide on previous projects and for other documents on the project. Morgan invited SN to meet with CP/Hemmera any time from now to February 11, 2022 to go through the changes together and get their comments. Morgan attached an overview of the Offsetting Plan, concept, and habitat that has been discussed to-date. Morgan added that she will be handing off engagement support activities to Eliza Bethune, and requested a SN account for her.	Offsetting Overview PPT Suggested Offsetting Locations	N/A	Post-application
26-Jan-22	Tsleil-Waututh Nation	Email	Eliza Bethune, Hemmera	Referrals, TWN cc: Brittany John, TWN	Eliza forwarded Morgan's email from the last week as it had been sent to the wrong referrals email address. In the original email, Morgan provided the TWN with updates on the Project, specifically about the Port PER Category C Permit and FAA Applications in June 2021. Morgan explained that after resubmission, the Port informed CP the proposed offsetting location could no longer be used and after further discussion, two potential new offsetting locations were selected for further study: Berry Point and Barnet Marine Park. Morgan noted that the proposed habitat offsetting design shared with the TWN has not changed. Morgan said CP considers Berry Point favourable for replicating this offsetting design previously reviewed, and is waiting to hear back from Shellburn Terminal that the proposed offsetting will not adversely impact Shellburn's ongoing infrastructure or operations. Morgan said CP plans to resubmit the PER Category C Permit Application and FAA Application on February 11, 2021, including a revised Offsetting Plan, which will be available for review and comment on February 4, 2022. Morgan apologized as this does not meet the 45-day review period that CP has been able to provide on previous projects and for other documents on the project. Morgan invited the TWN to meet with CP/Hemmera any time from now to February 11, 2022 to go through the changes together and get their comments. Morgan attached an overview of the Offsetting Plan, concept, and habitat that has been discussed to-date. Morgan added that she will be handing off engagement support activities to Eliza Bethune, but will continue to monitor the Project and connect with CP directly.	Offsetting Overview PPT Suggested Offsetting Locations	N/A	Post-application
2-Feb-22	Tsleil-Waututh Nation	Email	Clarice Celeste, TWN	Eliza Bethune, Hemmera cc: Brittany John, TWN	Clarice thanked Eliza for the update and said she would take the new proposed offsetting location to the team for review and get back to her. In the meantime, they look forward to receiving the redlined Offsetting Plan.	N/A	N/A	Post-application

### Engagement Log

Date	Indigenous Community	Method	Sender/Attendee	Recipient	Description	Attachment(s)	Current Actions	Project Phase
7-Feb-22	Musqueam Indian Band	Email	Morgan Tanner, Hemmera	Kayla Phillips, MIB Erin Larocque, MIB Morgan Guerin, MIB cc: Kiley Gibson, CP Joe Walker, Hemmera Eliza Bethune, Hemmera	Eliza let MIB know CP is now targeting distribution of the revised Offsetting Plan, including the redlined version, for the week of February 14 and will resubmit the PER Category C Permit and FAA Application the following week. Eliza noted that CP recognizes that MIB will be consulted by both the Port and DFO to provide feedback on the PER Category C Permit Application and FAA Application, respectively. The draft habitat design within the Offsetting Plan will not be finalized until the Port and DFO complete their duty to consult, thus leaving additional opportunities for Kwikwetlem First Nation to provide feedback outside of the 5 business days CP will provide starting the week of February 14th. CP welcomes the MIB's direct feedback during the Port and DFO's consultation periods. She added that CP will invite the MIB to send a field technician to participate (virtually or in-person) in the upcoming sediment sampling characterization program at the Project site.	Offsetting Overview PPT Suggested Offsetting Locations	N/A	Post-application
7-Feb-22	Tsilil-Waututh Nation	Email	Eliza Bethune, Hemmera	Clarice Celeste, TWN cc: Brittany John, TWN Kiley Gibson, CP Joe Walker, Hemmera Morgan Tanner, Hemmera	Eliza thanked Clarice for her email and let her know CP is now targeting distribution of the revised Offsetting Plan, including the redlined version, for the week of February 14 and will resubmit the PER Category C Permit and FAA Application the following week. Eliza noted that CP recognizes that TWN will be consulted by both the Port and DFO to provide feedback on the PER Category C Permit Application and FAA Application, respectively. The draft habitat design within the Offsetting Plan will not be finalized until the Port and DFO complete their duty to consult, thus leaving additional opportunities for TWN to provide feedback outside of the 5 business days CP will provide starting the week of February 14th. CP welcomes TWN direct feedback during the Port and DFO's consultation periods. She added that CP will invite TWN to send a field technician to participate (virtually or in-person) in the upcoming sediment sampling characterization program at the Project site.	N/A	N/A	Post-application
7-Feb-22	Kwikwetlem First Nation	Email	Eliza Bethune, Hemmera	Craig Orr, KFN cc: Morgan Tanner, Hemmera Cassandra Harper, KFN Kiley Gibson, CP Joe Walker, Hemmera Referrals, KFN	Eliza thanked Craig for his email and let him know CP is now targeting distribution of the revised Offsetting Plan for the week of February 14 and will resubmit the PER Category C Permit and FAA Application the following week. Eliza noted that CP recognizes that Kwikwetlem First Nation will be consulted by both the Port and DFO to provide feedback on the PER Category C Permit Application and FAA Application, respectively. The draft habitat design within the Offsetting Plan will not be finalized until the Port and DFO complete their duty to consult, thus leaving additional opportunities for KFN to provide feedback outside of the 5 business days CP will provide starting the week of February 14th. CP welcomes KFN's direct feedback during the Port and DFO's consultation periods. She added that CP will invite KFN to send a field technician to participate (virtually or in-person) in the upcoming sediment sampling characterization program at the Project site.	N/A	N/A	Post-application

# **APPENDIX C**

## **Project Introduction Letter**





Joe Van Humbeck  
System Manager Environmental Assessment  
Environmental Risk

7550 Ogden Dale Road SE  
Calgary Alberta  
Canada T2C 4X9

T 403 319 6530  
C 403 809 2530  
E Joe\_VanHumbeck@cpr.ca

[Insert date]

[Inset Indigenous group mailing address]

Dear Chief and Councillors,

**Re: Canadian Pacific Projects in Burrard Inlet and Pitt Meadows – Upcoming Activities**

Further to previous communications, Canadian Pacific (CP) continues to advance rail expansion projects in both Burrard Inlet and Pitt Meadows, British Columbia. These projects support the Greater Vancouver Gateway 2030 program objectives of removing bottlenecks in the transportation network to help the economy grow. As these projects progress, CP is committed to supporting meaningful consultation and maintaining mutually respectful relationships with communities and their leaders. Additional project information is provided below.

***Burrard Inlet Road and Rail Improvement Project: Phase 4 of the Viterra-Cascadia Terminal Capacity Expansion Project***

As part of the Vancouver Fraser Port Authority (VFPA) Burrard Inlet Road and Rail Improvement Project (BIRR), CP is starting planning for Phase 4 of the Viterra-Cascadia Terminal Capacity Expansion Project (Phase 4) along the south shore of Burrard Inlet, east of the Second Narrows Bridge in Burnaby, British Columbia (see **Figure 1**). Phase 4 builds on our Phase 3 project which is ongoing and includes building a 300-m track extension east of the Second Narrows Bridge.

Phase 4 will involve an additional 1,500-m extension to the third track. This will allow for assembly of 8,500-ft trains clear of the mainline track and reduce delays for other trains serving freight and passengers downtown. Phase 4 will also involve the installation of additional rail switches to the east of the track extension.



**Figure 1 Proposed Project Location (Phase 4)<sup>1</sup>**

To extend the track, CP will widen the existing rail bed by placing clean, engineered fill material into the intertidal and potentially subtidal marine environment in Burrard Inlet. Fill placement may result in adverse impacts to intertidal fish habitat and potentially subtidal fish habitat in the marine environment, which CP is committed to mitigating and/or offsetting. The method of construction has not yet been determined, but three potential options have been identified for further study: (1) water-based access using barges; (2) constructing a road either on CP property or in the intertidal zone westward from the public crossing at Penzance Drive; and, (3) constructing a new road to access the track from the Parkland Refinery. At this time, construction is proposed for late summer – fall of 2021 (see further schedule details in **Table 1**).

Prior to construction, several studies will be conducted, including archaeological screening, a geotechnical drilling program to characterize soil conditions, and a biophysical survey to characterize environmental conditions. These studies will support design, environmental assessment, and permitting activities.

Phase 4 will require approval from the VFPA through their Project and Environmental Review (PER) process, as well as a lease with the VFPA for the expanded track. Fisheries and Oceans Canada may also require an authorization under Section 35(2) of the *Fisheries Act* prior to construction. The *Fisheries Act* Authorization (FAA) will require offsetting for any effects to fish and fish habitat remaining after mitigation measures have been applied.

<sup>1</sup> Details on the location of infilling in Burrard Inlet will be provided as more information becomes available.

The tentative project schedule is as follows:

**Table 1 – Tentative Project Schedule (Phase 4)**

#	Description	Proposed Date(s)
1	Archaeological Screening	April/May 2020
2	Geotechnical Drilling Program	May 2020
3	Biophysical Assessments	April - July 2020
4	PER Application Preparation	Summer - Fall 2020
5	FAA Application Preparation	Summer - Fall 2020
6	Construction	Summer - Fall 2021

***Pitt Meadows Road and Rail Improvement Project***

The Vancouver Fraser Port Authority (VFPA) and CP are working together to reduce adverse impacts of growing rail and port-related traffic on Pitt Meadows through the Pitt Meadows Road and Rail Improvement (PMRR) Project. The PMRR project encompasses construction of: (1) a new four-lane underpass at Harris Road; (2) a new two-lane overpass at Kennedy Road; and, (3) new rail infrastructure which is the focus of this letter.

Specifically, CP is proposing to construct approximately 5,000 m of new rail siding from approximately the existing Kennedy Road crossing to the Maple Meadows West Coast Express commuter rail station (see **Figure 2**). The additional track will enable trains waiting to cross the Pitt River bridge to pull off of the mainline and let eastbound trains across. In addition, it will allow the assembly of eastbound intermodal trains clear of the mainline. It has not yet been determined if the new track will be constructed on the north, south, or both sides of the Right-of-Way. All options will require a new bridge crossing over the Katzie Slough. Construction is currently being planned, but a portion of construction works could begin as early as 2021. The work at the east end will occur in 2023/24 following construction of the underpass at Harris Road (see **Table 2** for further schedule details).





**Figure 2 Proposed Project Location (Rail Siding)**

In support of the rail expansion, CP will conduct several studies to inform project planning and any required assessments. An archaeological screening has been conducted on the north side of the track; depending on the location of the track, additional archaeological work may be required. A geotechnical drilling program and detailed environmental and community screening will also be conducted.

**Table 2 – Tentative Project Schedule (Rail Siding)**

Item	Description	Proposed Date(s)
1	Archaeological Screening	North Side Complete
2	Environmental and Community Screening	March – April 2020
3	Potential Additional Archaeological Screening	Summer 2020
4	Geotechnical Drilling Program	Spring 2020
5	Rail Siding Construction	2021-24

***Next Steps***

I would be happy to provide further information or discuss the projects described above. Please feel free to contact me by email at **Joe\_VanHumbeck@cpr.ca** or cell phone at **403-809-2530** if you have any questions or concerns.

Sincerely,

Joe Van Humbeck  
System Manager Environmental Assessment  
Canadian Pacific

# **APPENDIX D**

## **Heritage Inspection Permits**





**Musqueam Indian Band**

6735 SALISH DRIVE VANCOUVER,  
BC V6N 4C4  
TELEPHONE: 604-263-3261  
FAX: 604-263-4212

**MUSQUEAM INDIAN BAND  
Heritage Research/Investigation Permit**

PERMIT NUMBER: **MIB-2020-060-AIA**

This is to certify that the Musqueam Indian Band Council authorizes

**Ewan Anderson, Terra**

(Name of Permit Holder and Affiliation)

To conduct heritage research/investigation in Musqueam Traditional Territory.

**Cascadia Phase 4 AIA, Burnaby**

(Project Type and Location)

**CP Rail's proposed Cascadia Expansion**

(Development Description)

04/14/2020

(permit application date)

05/05/2021

(permit expiry date)

**UBC Laboratory of Archaeology**

(Name of approved repository)

Subject to the following conditions:

1. The Permit Holder will adhere to all Musqueam Indian Band policies relating to heritage resources.
2. The Permit Holder will adhere to the standards and guidelines accepted by the Musqueam Indian Band.
3. The Permit Holder is subject to all policies outlined in the permit application.
4. Other: **NA**

  
\_\_\_\_\_ / 2020/05/05

(Musqueam Band Archaeologist or Designate) / Date (year/month/date)

**Other Terms:**

This permit is subject to review, revision, extension or cancellation at the discretion of the Band Manager or other person designated by Musqueam.

The Permit Holder will:

- Contact the Musqueam Indian Band archaeologist Aviva Rathbone or designate before commencing work.
- Notify Musqueam and apply for a permit amendment should investigation procedures change.
- Take all possible steps to avoid archaeological site disturbance. This includes avoiding site mitigation if possible.
- Observe and record as necessary archaeological site information, identify and document intact cultural deposits where encountered, provide a detailed listing of all references used as source materials.
- Stop all work and immediately contact Musqueam Band archaeologist Aviva Rathbone or designate if intact cultural deposits or ancestral remains are encountered (intact burial or isolated bone fragments) or a change in field methods is contemplated.
- Collect all surface cultural materials that may be disturbed by the investigation and proposed construction, or those subject to adverse impact or unauthorized collection, and provide the Band an analysis and site location of those artifacts observed or collected.
- As necessary, document site damage and site potential locations.
- Complete a draft report and provide a copy to Musqueam for review before finalization.
- Include in the report details on observations of the fieldwork including reference to extent of archaeological materials, descriptions of disturbed or intact cultural material encountered, site significance, recommendations for site avoidance or mitigation, and site impact management.
- Relate the report and map of the field area to current data collected and where appropriate to existing data on these locations and to similar maps of the surrounding area.
- At least one member of the Musqueam community will assist in the field work as a field technician unless other arrangements have been made with Musqueam.
- Report periodically to Musqueam Indian Band Archaeologist Aviva Rathbone or designate, on the status and nature of research to date.
- Receipt of this permit confirms payment of the permit application fee of \$315 for small project and \$525 for large projects (GST # 131222804)



Tseil-Waututh Nation  
*Children of TAKaya - Wolf Clan*



**Cultural Heritage Investigation Permit**

**CHIP Number Issued: 2020-074**

**Permit Issue Date: June-16-20**

**Permit Expiry Date: June-16-21**

**Applicant Name: Ewan Anderson**

**Applicant Company Affiliation: Terra Archaeology Ltd**

**Applicant Project/File Number: 20-1347-002**

**Proponent: Hemmera, Morgan Tanner**

**HCA Permit (or Application) Number: 2018-0282 (Blanket)**

**TWN Project Number: 19-044**

**TWN Project Name: Cascadia Phase 4**

**Application Received (Date): May-15-20**

**Type of Application: Regular Project**

**Total Application Fee Paid: \$315.00 (\$300.00+GST)**

**Cheque or EFT Number: 7017**

**TWN Contact: Alessandria Testani (archaeology@twnation.ca)**

**Approval Stamp:**



GST No. 133551465

This permit acts as a receipt of payment for the above-listed permit application fee.  
At Permit Expiry Date, if final report has not been submitted to TWN please contact us for renewal.



June 1, 2020

Ewan Anderson

Terra Archaeology Limited  
[ewan@terraarchaeology.com](mailto:ewan@terraarchaeology.com)

Dear Shana,

Your permit application for the project entitled **Cascadia Phase 4 AIA** has been reviewed and accepted under the terms of the *Stó:lō Heritage Policy Manual (2003 v1.1)* - maintained by Stó:lō Research and Resource Management Centre on behalf of the Stó:lō Nation and Stó:lō Tribal Council. You have been assigned **Stó:lō Heritage Investigation Permit #2020-081** for this project, as noted on the following permit document.

Please note that issuance of this permit is separate and apart from the consultation process associated with any development proposal(s) to which this project is linked. The issuance of this permit in no way contributes to or in any way relieves the project proponent's consultative duties with First Nations. This document is issued as a result of having satisfied the process of technical review associated with the proposed program of archaeological investigation, in accordance with the *Stó:lō Heritage Policy Manual (2003 v1.1)*. If you have any questions or comments, please feel free to contact me at the above address.

Sincerely,

Cara Brendzy, B.A., B.App.GIS, B.Tech.ForensicInvestigation, RPCA  
Project Archaeologist/GIS Specialist  
Stó:lō Research and Resource Management Centre  
604-824-5107  
[cara.brendzy@stolonation.bc.ca](mailto:cara.brendzy@stolonation.bc.ca)





# STÓ:LŌ



## HERITAGE INVESTIGATION PERMIT

No. 2020-081

**Permittee:** Ewan Anderson

**Project:** Cascadia Phase 4 AIA

**Permit Issuance/Expiry Dates:** June 1, 2020 / December 31, 2020

### Stó:lō Heritage Investigation Permit - Terms and Conditions:

1. The permit holder is responsible for ensuring that all staff working on this project are familiar with the Stó:lō Heritage Policy Manual (a copy of this document will be provided upon request).
2. The permit holder will hire at least one Stó:lō community member **to be arranged by the SRRMC** to assist in conducting this project.
3. In the event that human remains are identified at any time during the course of this project, the permit holder must immediately cease and stabilize any disturbance of the remains, and call (604-824-5107) or email (admin@srrmcentre.com) the Stó:lō Research & Resource Management Centre (SRRMC) – representing the Stó:lō Nation & Tribal Council - of the nature and location of the remains, and implement any instructions provided regarding the treatment of the remains.
4. *Prior* to the production of the final report, the permit holder will provide the SRRMC Archaeology Department an opportunity to review and comment on results/findings and management recommendations relating to this project.
5. Implementation and inclusion of editorial comments made by Stó:lō Nation, Stó:lō Tribal Council, and/or SRRMC representatives with regard to management recommendations and/or any other portion of the project report will be negotiated between the permit holder and the archaeology staff at SRRMC, *prior* to report finalization.
6. The permit holder shall provide the SRRMC Archaeology Department with **one hard copy and one digital copy** of the final report (***including the Stó:lō Heritage Permit number on the cover***) for this project, *prior* to the expiration of this permit. All final reports are expected to meet or exceed the reporting standards developed by the provincial Archaeology Branch. In the event that provincial reporting standards and/or guidelines are not applicable to this project, the permit holder is responsible for developing such standards/guidelines in consultation with SRRMC Archaeology Department.
7. The permit holder shall provide the SRRMC Archaeology Department one copy of any updated or newly recorded British Columbia Archaeological Site Inventory Form(s) resultant from the project. Site forms should be submitted with the final report as electronic files.
8. Any application for extension of this permit must be made at least 30 days prior to the permit expiry date.
9. Reasonable amendments to this permit may be requested in writing on an 'as needed' basis.
10. A representative(s) of the Stó:lō Nation, Stó:lō Tribal Council, and/or the SRRMC may at any time inspect any project being conducted under this permit.
11. The permit holder shall provide the SRRMC Archaeology Department with one completed copy of the *Heritage Investigation Project Summary Form* upon submission of the final report.
12. Any project-related disturbance(s) of archaeological sites / project area must be mitigated (i.e., returned to their pre-existing state) upon completion of the project.
13. Failure to comply with any of the above permit conditions may affect future permit eligibility.
14. If the Stó:lō Material Cultural Repository is the chosen project repository, the Permit Holder is responsible for repository fees.
15. A local or First Nation repository will be assigned to a project, unless an alternative repository is required to keep collections together.

Permit Signatory 

Dated: June 1, 2020



May 13, 2020

Ewan Anderson  
Terra Archaeology Limited  
Suite 303 – 45 Bastion Street  
Victoria, BC

Dear Ewan Anderson:

***RE: AIA for Cascadia Capacity Expansion Phase 4 Project***

With reference to your application dated April 14, 2020 on the above noted project, please find enclosed Permit #20-0125 for your records. This permit covers your work plan as described in your application covering the period between May 13, 2020 and December 31, 2020.

We acknowledge receipt of your cheque in the amount of \$300.00 to cover the fees for this permit.

Trusting your investigation will be/has been successful and we await your report upon completion. Please be aware that our office will require (2) copies of the 'Final Report/s', as identified on page 3 of the enclosed permit.

Sincerely,

**SQUAMISH NATION**

Peter Baker

encl. - permit #20-0125



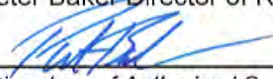
<b>PERMIT NUMBER</b>	<b>20-0125</b>
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<b>PERMIT PERIOD</b>	<b>20</b>	<b>05</b>	<b>13</b>	<b>to</b>	<b>20</b>	<b>12</b>	<b>31</b>
	<b>YY</b>	<b>MM</b>	<b>DD</b>		<b>YY</b>	<b>MM</b>	<b>DD</b>

# ARCHAEOLOGICAL INVESTIGATION PERMIT

Peter Baker Director of Rights and Title

**ISSUED BY:**

  
(Signature of Authorized Squamish Nation Official)

**ISSUE DATE:**

May 13, 2020

**ISSUED TO:**

Ewan Anderson <i>(Name of Permit Holder)</i>	Terra Archaeology Limited <i>(Company Name)</i>
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Is hereby authorized to conduct an Archaeological Investigation as described in the Application by the permit holder dated 

yy/mm/dd	2020	04	14
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 subject to the terms and conditions set out on the reverse-side of this Permit as well as the additional conditions below.

### ADDITIONAL TERMS AND CONDITIONS

Check off complete, if applicable:

1. A Squamish Nation Representative is to be employed in the investigation by the permit-holder.

2. The permit-holder is to deposit artifacts, samples and other archaeological materials generated by this investigation, in trust for Squamish Nation with:

**Royal British Columbia Museum – Contact Genevieve Hill 1-250-387-2499**

(Name of Institution or other trustee)

**TERMS AND CONDITIONS**

1. This Archaeological Investigation Permit is valid only for the permit period indicated. The permit period may be extended by Squamish Nation upon receipt from the permit holder of a written application for an extended permit period 30 days before expiry.
2. The permit-holder must advise Squamish Nation of any changes in the investigation as described in the Permit Application prior to implementing the changes. Prior to the permit-holder implementing any changes, approval in writing is required by the Squamish Nation. Failure to advise Squamish Nation of such changes may terminate the Permit.
3. A person designated by Squamish Nation may at any time inspect any investigation being conducted under Permit, including records or materials recovered under the authority of the Permit.
4. Upon completion of any investigation involving excavations, the permit-holder shall ensure all sites are restored as nearly as possible to their former condition, to the satisfaction of Squamish Nation.
5. The permit-holder must provide Squamish Nation with a copy of all reports, thesis, dissertations, papers and any other statements of findings of the investigation within 60 days of completion. If no final reports or findings are generated, the permit-holder must inform Squamish Nation in writing of the objectives, methods and results of the investigation.
6. The permit-holder must provide Squamish Nation with a copy of all field notes, forms, photographs and other original documents resulting from the investigation.
7. **The permit-holder must be present “on site” for at least 80% of all fieldwork undertaken under this Permit.**
8. If human remains are found, the permit-holder must contact Squamish Nation immediately and must not disturb the remains until authorized by Squamish Nation.
9. The permit-holder must contact Squamish Nation regarding the “ethnic significance” of any archaeological remains found.
10. The permit holder must facilitate weekly progress updates for projects conducted over multiple weeks, and end of day summaries where cultural materials and/or archaeological features of significant interest are recovered.

Note: SQUAMISH NATION REQUIRES (2) COPIES OF THE “FINAL REPORT”

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**SUBMIT ‘INTERIM REPORTS’ AND ‘FINAL REPORTS’ TO:**

**Denise Jensen**

**Squamish Nation**

415 West Esplanade, North Vancouver, V7M 1A6

Telephone: 604-982-0510 Fax: 606 982-0515

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# **APPENDIX D**

## **Extended Photo Log**



**Photo 1** Overview of the Project area to the west of the refinery. Photo facing southeast.



**Photo 2** Overview of the Project area to the east of the refinery. Photo facing southeast.



**Photo 3** Anthropogenic structure located along the Crabtown Creek watercourse alignment; facing south (June 19, 2020).



**Photo 4** Crabtown Creek culvert outlet to the Burrard Inlet; facing north (June 19, 2020).





**Photo 5** Starfish Creek discharging into grated manhole south of the existing rail track (June 19, 2020).



**Photo 6** Starfish Creek perched culvert outlet to the Burrard Inlet shoreline; looking north (June 19, 2020).





**Photo 7** Looking at Structure-1 drainage conveyance structure (June 19, 2020).



**Photo 8** Culvert outlet. Photo facing north.



**Photo 9** Looking north at the CMC inlet and wetted depression conditions (June 19, 2020).



**Photo 10** Looking northeast at the CMC outlet (June 19, 2020).





**Photo 11** Looking downstream from T-1 towards the Burrard Inlet (June 19, 2020).



**Photo 12** Looking upstream from T-2 at characteristic channel conditions (June 19, 2020).



**Photo 13** Concrete box culvert inlet (June 19, 2020).



**Photo 14** Concrete box culvert outlet (June 19, 2020).





**Photo 15** Representative image of riparian stand to the west of the refinery. Photo facing east.



**Photo 16** Representative photo of riparian stand to the east of the refinery. Photo facing south.





**Photo 17** Red alder tree (*Alnus rubra*) to the west of the refinery. Photo facing southeast.



**Photo 18** English ivy and invasive Himalayan blackberry surrounding larger trees to the west of the refinery. Photo facing south.





**Photo 19** Large big leaf maple trees to the east of the refinery. Photo facing south.



**Photo 20** Riparian stand adjacent to culvert outflow east of the refinery. Photo facing southeast.





**Photo 21** Western sword ferns interspersed with red alder east of the refinery. Photo facing south.



**Photo 22** Representative substrate within the fucus band east of the refinery.





**Photo 23** Representative substrate from the low intertidal zone east of the refinery.



**Photo 24** Bedrock substrate in the lower intertidal west of the refinery. Photo facing west.





**Photo 25** Representative lower intertidal substrate west of the refinery. Photo facing south.



**Photo 26** Gaper clams (*Macoma spp.*) sampled during infaunal survey.





**Photo 27** Cockle (*Cardiidae* spp.) sampled during the infaunal survey.



**Photo 28** Characteristic substrate in the subtidal zone east of the refinery. Photo taken June 14<sup>th</sup>, 2020.





**Photo 29** Characteristic substrate in the shallow subtidal zone west of the refinery. Photo taken June 13<sup>th</sup>, 2020.



**Photo 30** Characteristic substrate in the deep subtidal zone west of the refinery. Photo taken June 13<sup>th</sup>, 2020



**Photo 31** Dungeness crab (*Metacarcinus magister*) east of the refinery. Photo taken June 14<sup>th</sup>, 2020.





**Photo 32** Leather star (*Dermasterias imbricata*) located west of the refinery. Photo taken June 13<sup>th</sup>, 2020.



**Photo 33** Ochre star (*Pisaster ochraceus*) located west of the refinery. Photo taken June 13<sup>th</sup>, 2020.

# **APPENDIX E**

## **Dive Survey Results**

# Dive Survey Results

Common name	Latin name
<b>Algae</b>	
Black pine	<i>Neorhodomela larix</i>
Branching coralline seaweed	<i>Corallina sp.</i>
Bull kelp	<i>Nereocystis leutkeana</i>
Diatoms	Diatom mat
Five-ribbed kelp	<i>Costaria costata</i>
Graceful green hair	<i>Cladophora sericea</i>
Pink encrusting coralline seaweed	<i>Coralline crust sp.</i>
Porphyra sp.	<i>Porphyra sp.</i>
Red filamentous	<i>Rhodymenia sp.</i>
Ribbon kelp	<i>Alaria marginata</i>
Rockweed	<i>Fucus distichus/garderni</i>
Rusty rock	<i>Hildenbrandia rubra</i>
Sea cauliflower	<i>Leathesia marina</i>
Sea lace	<i>Microcladia coulteri</i>
Sea lettuce	<i>Ulva lactuca</i>
Splendid iridescent seaweed	<i>Mazzaella splendens</i>
Split kelp	<i>Saccharina bongardiana</i>
Stiff-stiped kelp	<i>Laminaria setchellii</i>
Succulent seaweed	<i>Sarcodiotheca guadichaudii</i>
Sugar kelp	<i>Saccharina latissima</i>
Turkish towel	<i>Chondracanthus exasperatus</i>
Turkish washcloth	<i>Mastocarpus papillatus</i>
Unknown iridescent seaweed	<i>Mazzaella sp.</i>
Unknown red blade	-
Unknown red filamentous	-
Wireweed	<i>Sargassum muticum</i>
<b>Invertebrates</b>	
Acorn barnacle	<i>Balanus glandula</i>
Amphipod	Family Grammarus
Cockle	<i>Cardiae spp.</i>
Decorator crabs	<i>Majoidae spp.</i>
Dungeness crab	<i>Metacarcinus magister (Cancer magister)</i>



Flatworm	<i>Notoplana sanguinea</i>
Green ribbon worm	<i>Emplectonema gracile</i>
Green shore crab	<i>Carcinus maenas</i>
Hole (siphons)	-
Horse clam	<i>Tresus sp.</i>
Ladybug	-
Leather star	<i>Dermasterias imbricate</i>
Lined limpet	<i>Tectura fenestrata</i>
Mottled star	<i>Evasterias troschelii</i>
Ochre star – adult	<i>Pisaster ochraceus</i>
Ochre star – juvenile	<i>Pisaster ochraceus juv.</i>
Orange ribbon worm	<i>Tubulanus polymorphus</i>
Orange sea cucumber	<i>Cucumaria miniate</i>
Orange sponge	-
Pacific blue mussel	<i>Mytilus trossulus</i>
Piddock	<i>Zirfaea pilsbryi</i>
Purple ribbon worm	<i>Paranemertes peregrina</i>
Purple shore crab	<i>Hemigrapsus nudus</i>
Red rock crab	<i>Cancer productus</i>
Rockweed isopod	<i>Pentidotea wosnesenskii</i>
Snail	-
White ribbon worm	-
<b>Fish</b>	
Starry flounder	<i>Platichthys stellatus</i>
Tube-snout	<i>Aulorhynchus flavidus</i>