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Engineering

GLOBAL PERSPECTIVE.
LOCAL FOCUS.

REPORT

Ministry Of Environment and Climate Change Strategy

Hatzic Emergency Work Program Pattison Creek



FEBRUARY 2024



Platinum
member

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Ministry Of Environment and
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Figure 1-1 Pattison Creek Overview

2

1 INTRODUCTION

1.1 Purpose of Report

This report documents the completion of emergency construction and sediment removal works on Pattison Creek, immediately downstream (south) of Sylvester Road Bridge, Hatzic Valley, just east of Mission, B.C.

Associated Engineering (B.C.) Ltd. (Associated) was retained by the BC Ministry of Environment and Climate Change Strategy (ENV) to lead the technical aspects of this project, with PWC acting as ENV's client representative.

Note that the works are located on crown land and private property.

1.2 Background

Bank erosion and sediment deposition occurred within Pattison Creek, adjacent to Sylvester Road, during the November 2021 regional flood event, resulting from multiple atmospheric rivers through southwest BC. Rainfall within the mountainous upper watershed of Pattison Creek mobilized large volumes of rock debris and sediment; deposition of the mobilized debris and sediment occurred within the stream channel, ranging from boulders no greater than 1 metre diameter to fine streambed materials, thereby reducing the channel capacity.

ENV/PwC commissioned QP assessments and tech memos (**Appendix A**) that outlined the need for emergency sediment removal and bank repairs. This work was subsequently approved and completed under the technical direction of Associated with oversight from PwC. The intent of this work was to restore conditions to "pre-flood conditions" by repairing damaged banks and removing sediment.

1.3 Location

The Project location is in the Hatzic Valley, in the southern, lowland portion of the Fraser Valley Regional District, British Columbia.

The Pattison Creek project site is located at approximately 49°13'27" N and 122°13'31" W, adjacent to 12172 Sylvester Road, and approximately 8.5 kilometres north of Highway 7 (Lougheed Highway).

Legal Description:

Portion of Plan 13275, being SW Quarter of Section 19, Township 21, and

Portion of Plan 6149, being Section 24, Township 18 and

Crown Lands of Township all of New Westminster Land District

And refer to Priority site# S-CR-12 of the BC Ministry of Environment & Climate Change Strategy see Figure 1-1.

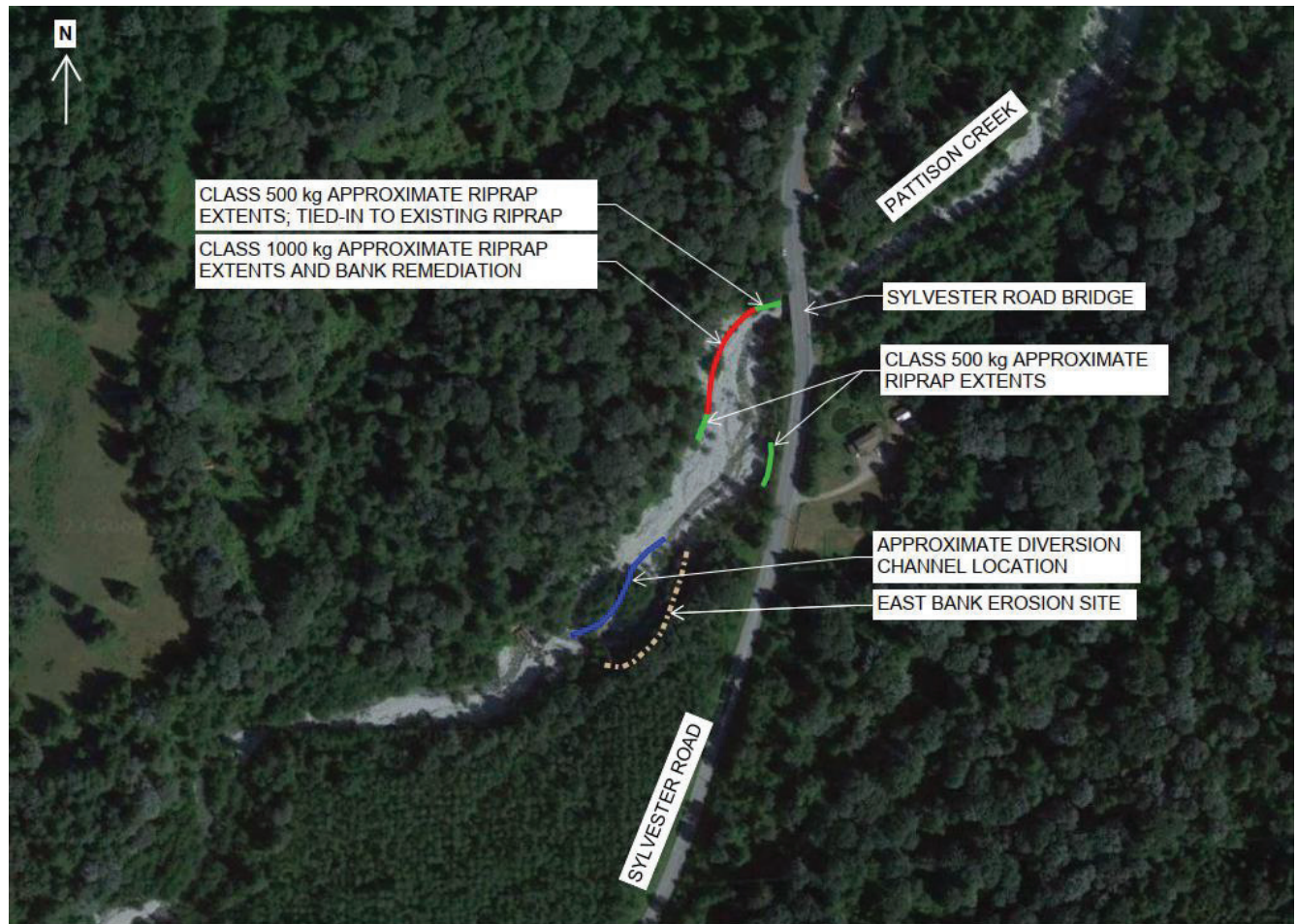
1.4 Scope

The scope of work for this recovery project is generally described as follows:

- Sediment and debris removal.
- Bank repairs and erosion protection to current codes and standards.
- Channel realignment (additional, discussed further in **Section 2**).

Sediment removal works were performed throughout nearly 200 metres of channel immediately downstream (south) of Pattison bridge on Sylvester Road. The upstream extent of sediment removal works terminated at the underside of the bridge; refer to **Figure 1-1** below for a site overview.

Figure 1-1 Pattison Creek Overview



1.5 Project Team

The Associated project team included:

- Program Manager – Jamie Fitzgerald, ASCT, P.Eng.
- Engineer of Record – Andrew Wiens P.Eng.
- Field Engineer – Trevor Friedmann P.Eng.
- Project Coordinator – Dianna Christopoulos.
- Contract Administration – Eric Finney, P.Eng.
- Site Inspector– Lorne Semenowich BCLS.

Subconsultant support was provided by Leq'a'mel First Nation, from Deroche, B.C. for Archaeological/Cultural Resource Management with the following staff:

- Rick McKamey – Environmental Lead.
- Jason Thompson – Environmental Monitor.
- Tina Pederson - Environmental Monitor Coordinator.

The general contractor for the work was Summit Earthworks Inc., with the following key staff:

- Ed Jones – VP Operations.
- Jamie De Groot – Project Manager.
- Geoff Ratcliff – Site Superintendent.
- Matthew Joyce – Sartori Environmental Inc.

On behalf of the client, project direction was provided by the following:

- PWC Project Manager – Tim Stanley.
- Project Sediment Manager – Fred Bjork.
- ENV – BC Ministry of Environmental and Climate Change Strategy, Victoria, BC-Thyren Jacobs.
- Ministry of Forests, Victoria – Malissa Smith, Assistant Water Manager.

2 DESIGN

2.1 Site Condition

Prior to commencement of work, the damaged right channel bank downstream of Pattison Bridge did not appear sufficient to contain channel flows approximately 1.5-2.0 metres above the existing channel thalweg. Deposited debris and sediment appeared to have aggraded the channel bed, resulting in the apparent reduction of channel capacity. Additionally, erosion was identified on the left channel bank, at the base of the Sylvester Road embankment, immediately east of the Sylvester Road Bridge. Expansive erosion sites, often 50 metres in length, were also identified further downstream on the left (east) channel bank.

Additionally, the channel thalweg had established against the left channel bank toe, actively undermining and eroding the exposed slope face approximately 150 m. downstream of the Sylvester Road Bridge. As a result, the low-flow channel was realigned to follow the middle of the overall channel footprint (see diversion channel noted in **Figure 1-1**).

2.2 Design Objective

The general design objective was to restore the site to pre-flood conditions as nearly as practical.

Given the site conditions mentioned above, the key design objectives were:

- Repair of the channel capacity by removing sediment.
- Repair of the damaged channel banks to current codes and standards.
- Repair of erosion protection on Sylvester Road to current codes and standards.

The design drawings are contained in Appendix B.

3 PERMITTING & APPROVALS

3.1 First Nations Consultation

The project is located within the traditional territory of the Leq'a'mel First Nation. Two First Nations Cultural Monitors (Jason & Tina) alternated on site from December 12th, 2022 to final walk through on Thursday, February 2nd, 2023.

Monitors were on site to observe and report the re-construction of the creek as per Associated drawings and field fits as per field engineer.

The First Nations Cultural monitors found no archaeological finds during the construction activities.

3.2 Environmental

The Fisheries Act is the main federal legislation for Canadian fisheries management through the conservation and protection of fish and fish habitat (RSBC 1985, c.F-14), and is administered by Fisheries and Oceans Canada (DFO). In accordance with Sections 34.4(2)(c) and 35(2)(c) of the Act, an authorization is required for any activity that may result in death of fish and harmful alteration, disruption or destruction of fish habitat. Sediment removal and bank protection works were anticipated to result in a HADD of habitat for fish in Pattison Creek, and an emergency Fisheries Act Authorization was issued by DFO on October 27, 2022, for all 12 impacted sites in the Hatzic Valley (22-HPAC-01308; Appendix Xi).

The provincial Water Sustainability Act protects the quality of water, fish and wildlife habitat, and the rights of licensed water users (SBC 2014, c15) and is administered by Ministry of Forests (FOR). Under Section 11 of the Act, any activities that result in "changes in or about a stream" require notification or approval. A Change Approval for Changes In and About a Stream on Pattison Creek was granted by FOR on December 14, 2022 (2010103; Appendix Xii) and additional area granted via amendment on January 6, 2023.

All instream works were to be conducted under the oversight of a Qualified Professional and in accordance with regulatory authorizations and approvals, the Pattison Creek – Sediment Removal and Bank Protection Environmental Management Plan (Associated Environmental, 2022), applicable DFO Codes of Practice, and provincial guidance in the "Requirements and Best Management Practices for Making Changes In and About A Stream in British Columbia" (2022).

The Construction Environmental Management Plan was prepared by Sartori Environmental in November 2022 under Fisheries Act Emergency Authorization #22-HPAC-01308, Water Sustainability Act (Change Approval#2010138) and subsequent amendment of January 6, 2022. Field work was done under best management practices and applicable environmental regulations.

Satori Environmental submitted their final Construction Environmental Management Plan on January 23, 2023.

3.3 Archeological

Leq'a'mel First Nation

- Provided cultural, archeological and environmental monitors to review the work daily, keeping records and submitting daily reports.

3.4 Other Approvals

Transportation Management Plan supplied by 604 Traffic Control Ltd., Chilliwack, B.C. for mobilization/demob of equipment, and delivery of rip rap.

4 CONSTRUCTION

4.1 Contract Award

The Province set the following requirements for contractor selection. The contractors were to be:

- Qualified to undertake instream work, with:
- Preferences for:
 - Local companies.
 - Indigenous companies and employees.

Additionally, we had identified the work as high priority and urgent due to expected precipitation pattern changes with the seasonal shift to fall.

For these reasons, we recommended local contractor be awarded to complete the work, Summit Earthworks Inc. Summit Earthworks had immediate availability and have previous experience in the expected type of work. Contract awarded under GS23EPFLOOD0092 – Summit Earthworks, Mission, BC. The Contractor Assessment is contained in **Appendix E**.

Approach to Construction

Activities along Pattison Creek occurred on both private land, for which permission from the landowner was obtained (Appendix G), and crown land. A Permit over Crown Land was included in the provincial Change Approval application for instream works and access to the south extent of the project area.

The main goals of the project were to remove sediment and increase capacity of the lower sections of Pattison Creek and to address the diversion channel in the downstream sections of the creek.

Generally, sediment removal was split into two sections:

- First section was near the bridge that armouring was required.
- Second section was the southerly area which required a channel diversion.

Summit Earthworks retained Satori Environmental Inc. out of North Vancouver to be their environmental monitor for the Pattison Creek.

4.2 Quality Control

Associated

- Provided daily inspection and review of the engineering components of the work.
- Tracked construction activities to support progress payment development.
- Provided engineering input and decision-making support.
- Kept daily reports of construction activities and contractor forces.

Summit Earthworks

- Prime Contractor responsible for site management, safety, coordination, overall delivery of the construction and subcontracted environmental monitoring to Satori Environmental.

Satori Environmental

- Developed Construction Environmental Management Plan.
- Provided spill response plan.
- Designed and implemented environmental measures for protecting aquatic life, fish salvage, managing spills, providing erosion and sediment control, and monitoring of water quality parameters.
- Kept daily records of work completed and pertinent information.

Leq'a: mel First Nation

- Provided cultural and environmental monitors to review the work daily, keeping records and submitting daily reports.

Construction reports from Associated, Satori, and Leq'a:mel are provided in **Appendix H**.

4.3 Changes During Construction

The following changes from design were implemented during construction:

- Class 1000 kg riprap was installed along the restored right channel bank, approximately 25 metres to 80 metres downstream of Sylvester Road Bridge, including Class 25 kg riprap filter layer per construction drawings.
- Class 500 kg riprap was installed along the restored right channel bank, approximately 10 metres to 15 metres downstream of Sylvester Road Bridge, as well as approximately 80 metres to 90 metres downstream of Sylvester Road Bridge. Installation included a Class 25 kg riprap filter layer per construction drawings.
- Recommended that Section 11 was increased (from 130m to 200m alignment length southerly) to include realignment of the existing low-flow channel and thalweg, as well as regrading of the adjacent channel bed. Budget increased for Environmental monitoring and design services occurred under Change Order #9 but not the overall construction budget affected. Realignment was performed to:
 - Help prevent continued erosion and undermining of the existing left channel bank in low-flow conditions.
 - Reduce mobilization of small sediment causing issues further downstream.
 - Minimize project cost while still reducing bank erosion; no riprap imported or excavated channel material to be exported.

In addition to the design changes implemented, the contractual changes implemented include:

- Change Order 1 – Delay Claim in December.
- Change Order 2 – Lock Blocks were acquired to restrict the general public to vehicle access ramp built.
- Change Order 3 – Invoices for rip rap & aggregate supply not originally included in contract.
- Change Order 4 – Security of site equipment and unit rates not originally included in contract.
- Change Order 5 – Equipment Changes and unit rates not originally included in contract.
- Change Order 6 – Mega Bags supply and unit rates not originally included in contract.
- Change Order 7 – Surveying requirement and unit rates not originally included in contract.

- Change Order 8 – Wood Waste requirement and unit rates not originally included in contract.
- Change Order 9 – Additional scope for environmental completion reporting to satisfy environmental permitting requirements.

4.4 Construction Monitoring

Environmental

Full time environmental monitoring was conducted by Sartori Environmental Inc. (Sartori) during instream works. As the environmental monitor (EM), Sartori was responsible for working with the Contractor(s) to develop measures to protect the environment, to respond to environmental incidents as they occurred, and ensure adherence to the requirements of the Construction Environmental Management Plan (CEMP) prepared by Sartori, environmental permit conditions and any applicable regulations. The CEMP is contained in **Appendix X**.

Environmental Inspection Reports (EIR) were prepared by Sartori and submitted to Associated every week, and were augmented by Daily Environmental Monitoring Reports submitted by Leq'a:mel First Nation. Daily environmental inspection reports are contained in **Appendix H**.

4.5 Project Completion

A final walkthrough was completed on February 2nd, 2023 by representatives of Summit Earthworks, Sartori Environmental, and Leq'a:mel First Nation, and Associated.

Substantial completion of the contract occurred on January 6th, 2023 for Richco Contracting, and January 19th, 2023 for Jake's Construction. Certificates of completion were issued those same days and notices posted to site in accordance with the BC Builder's Lien Act on March 2nd, 2023. These documents are included in **Appendix I**.

Record survey data was provided by Vector Geomatics and record drawings were produced (see **Appendix M**).

4.6 Summary of Key Dates

Table 4-1 Summary Of Key Dates

	Summit Earthworks (GS23EPFLOOD0092)
Contract signed	December 12, 2022
Pre-Construction Meeting	December 6, 2022
Summit mobilized to site	December 14, 2022
Work suspended (snow storm)	December 20, 2022
Site work restart	January 3, 2023
Final walk through	February 2, 2023
Certificate of Completion Issued	March 1, 2023
Lien Holdback Release	April 25, 2023

CERTIFICATION PAGE

This report presents the project summary for the Ministry Of Environment and Climate Change Strategy Hatzic Emergency Work Program Pattison Creek.

Respectfully submitted,

Associated Engineering (B.C.) Ltd.
Engineers & Geoscientists BC Permit Number 1000163

Prepared by:



Trevor Friedmann, P.Eng.
Water Resources Engineer

Reviewed by:



Andrew Wiens, P.Eng.
Senior Water Resources Engineer

APPENDIX A – AIC SITE ASSESSMENT TECH DEMO

Initial site assessment reports for areas of immediate concern (AIC) to allow the Province of BC to review and consider risks, potential consequences, and to prioritize urgent mitigation measures, including removal of sediments introduced by the 2021 Atmospheric River event (and other potential mitigation measures).

Please see folder for further information.

APPENDIX B - DESIGN SKETCHES/DRAWINGS

Design drawings submitted as part of the regulatory applications.

Please see folder for further information.

APPENDIX C - ENVIRONMENTAL APPROVAL DOCUMENTS

All the required environmental permits for this work including DFO, WSA Section 11 ,etc. are contained in this appendix.

Please see folder for further information.

APPENDIX D - ARCHEOLOGICAL PERMITS

The Province of BC obtained a Heritage Investigation Permit for flood recovery activities.

This Multi-Assessment Permit (MAP) will support government's response to and recovery from the widespread damage caused by 2021's catastrophic rain events and resulting flooding and landslides in the south and coastal regions of British Columbia. Various Provincial Ministries and Local Governments are tasked with responding to emergency events, restoring infrastructure, cleaning up debris and environmental contamination, and maintaining public health.

Please see folder for further information.

APPENDIX E - CONTRACTOR ASSESSMENT

This letter summarizes the process selecting and recommending suitable contractors for the flood recovery work.

Please see folder for further information.

APPENDIX F - CONTRACT DOCUMENT

Major Works contract between the Contractor and The Ministry of Environment and Climate Change Strategy.

Please see folder for further information.

APPENDIX G - ACCESS AGREEMENT

Land access agreement between the landowners/homeowners and The Ministry of Environment and Climate Change Strategy.

Please see folder for further information.

APPENDIX H - FIELD REVIEW REPORTS

All construction field reports from the Contractor, AE, Cultural Monitor and Environmental Monitor.

Please see folder for further information.

APPENDIX I - SUBSTANTIAL PERFORMANCE

- Certificate of Substantial Performance
- Deficiencies Letter
- Builders Lien Act (BLA) Certificate of Completion
- Notice of BLA Certificate of Completion

Please see folder for further information.

APPENDIX J - FINAL PROGRESS PAYMENT AND CLOSEOUT DOCUMENTS

- Release of Builders' Lien holdback (final progress payment)
- Certificate of Total Performance

Please see folder for further information.

APPENDIX K - CONTRACTOR PAYMENT SUPPORT INFORMATION

Progress claims from the contractor to The Ministry of Environment and Climate Change Strategy. Progress payment certificates prepared by AE.

Please see folder for further information.

APPENDIX L - BEFORE AND AFTER CONSTRUCTION PHOTOGRAPHS & PARAGRAPH OF WORKS FOR ENV

Before and after photos of the construction works.

Please see folder for further information.

APPENDIX M - RECORD DRAWINGS

Final record drawings of the completed construction work.

Please see folder for further information.

APPENDIX N - ENVIRONMENTAL MONITORING REPORT

Environmental Monitoring Reports from the contractors environmental monitor.

Please see folder for further information.

APPENDIX O - ARCHEOLOGICAL MONITORING REPORT

The project relied on a chance find procedure. Leqamel First Nation staff were engaged to monitor the site during construction and identified chance finds when found. This appendix contains their Inspection Reports.

Please see folder for further information.

Appendix A

June 24, 2022
AE File: 2022-2462-00

TEL: 604.293.1411
FAX: 604.291.6163
www.ae.ca

Fred Bjork, P.Eng.
Price Waterhouse Coopers
Submitted via email: fred.bjork@pwc.com

**Re: PRELIMINARY SITE ASSESSMENT OF POTENTIAL AREAS OF IMMEDIATE CONCERN
PWC SITE ID: S-CR-12 - PATTISON CREEK NEAR SYLVESTER RD BRIDGE, HATZIC, BC**

Dear Mr. Bjork:

The purpose of this high level and preliminary assessment of identified potential Areas of Immediate Concern is to allow the Province of BC to review and consider risks, potential consequences, and to prioritize urgent mitigation measures, including removal of sediments introduced by the 2021 Atmospheric River event (and other potential mitigation measures). The objective is to avoid hydraulic restrictions in the waterways and associated flooding due to the upcoming 2022 spring freshet, which may cause additional damage to riverbeds, banks, and infrastructure, and pose a significant threat to the safety of people, properties, infrastructure, and the environment.

1 SITE INFORMATION

Site ID: S-CR-12

Location: 49.224318, -122.225164

Site Description: Pattison Creek near Sylvester Road, Hatzic, BC

Local Government Agency: Fraser Valley Regional District (FVRD)

Waterbody: Pattison Creek

The site location is shown in **Figure 1** and **Figure 2** located at the end of the letter.

2 SITE HAZARD

2.1 HAZARD ASSESSMENT METHODOLOGY

The assessment, as summarised in this letter for the noted Area of Immediate Concern, follows the following general methodology and approach:

1. High level senior engineering level experience and judgement, review of available relevant reference information, site visits and visual inspections, and communication with relevant stakeholders;
2. Risk assessment; and
3. Identification and advice on prioritized and appropriate mitigation measures (if any), their required timing, and further work required to validate such advice.

Associated Engineering (AE) completed the assessment of the above-noted site, based on site visits completed on April 4 and April 5, 2022, and a review of the background data noted in [Section 3](#).

2.2 HAZARD ASSESSMENT SUMMARY

The November 2021 Atmospheric River resulted in significant flooding and widespread sediment deposition throughout Pattison Creek. Sediment from the steeper upstream portions of the Hatzic Lake watershed were transported to and deposited throughout downstream reaches of Pattison Creek and Lagace Creek.

Based on a review of previous assessments of Pattison Creek, it appears that sediment deposition is a regular occurrence during high-flow events (NHC, 2005). High flows are generated during fall and winter storms, such as an atmospheric river, rather than a freshet (snowmelt) event.

During our site assessment of the Sylvester Road Bridge across Pattison Creek, we noted the following:

1. Hydraulic capacity of the Sylvester Road Bridge opening appears acceptable;
2. Riprap erosion protection at the Sylvester Road Bridge appears acceptable;
3. Sediment deposition has occurred downstream of the Sylvester Road Bridge; and
4. Downstream of the bridge, the right (west) bank has been raised in the past to reduce the risk of a channel avulsion. This bank has been heavily eroded which presents an increased risk of a channel avulsion.

We anticipate that a channel avulsion at this location would result in flows leaving Patterson Creek and flowing west (downhill) across the alluvial fan to Lagace Creek. This would likely result in significant sediment and debris deposition in Lagace Creek. The Patterson Creek alluvial fan is undeveloped within the area of concern. However, we anticipate that an avulsion into Lagace Creek would create a hazard to public safety and infrastructure in upstream and downstream areas along Lagace Creek. Based on our site review, we anticipate a risk of additional berm erosion and channel avulsion during lower flow events, such as the freshet.

3 PRELIMINARY RISK EVALUATION

The Preliminary Risk Evaluation for the site is shown in [Table 3-1](#). The risk key is enclosed for ease of reference.

Table 3-1
Preliminary Risk Evaluation

Category	Preliminary Risk Evaluation	Anticipated Consequence
Public Health and Safety	High	A channel avulsion from Patterson Creek to Lagace Creek may result in public safety risks to areas both upstream and downstream.
River Capacity	Very High	Sediment deposition and bank erosion has significantly increased the risk of a channel avulsion from Patterson Creek into Lagace Creek.
Environmental	Medium	A channel avulsion would result in noticeable loss of vegetation. The presence of rare species or culturally valued sites is unknown.
Infrastructure	Very High	A channel avulsion may partially block Lagace Creek and result in flooding of upstream areas. A channel avulsion is expected to mobilize additional sediment and debris which would also negatively impact downstream areas of Lagace Creek. Private property would be at risk both upstream and downstream.

Based on the preliminary risk evaluation noted above, we assess the risk to be **Very High**. On this basis, we confirm that the site rating should remain as an Area of Immediate Concern.

The Preliminary Risk Evaluation is based on the following currently available information:

1. Background Reports:
 - a. Northwest Hydraulic Consultants. (2005, June). Flood Damage Recovery Plan. *Lagace Creek, Hatzic Valley*;
 - b. Associated Engineering. (1992, August). *Hatzic Prairie Drainage Study Volume 1*;
 - c. Stirling Geoscience Ltd. (2021, December 16). *Hatzic Prairie Creek Assessment and Preliminary High-Level Mitigation Cost Estimate, Hatzic Prairie, BC – Draft*.
2. Site Assessment completed on April 4/5, 2022;
3. Phone Conversation with Jamie Stirling, P.Eng. on April 6, 2022;
4. Google Satellite Imagery;
5. Discussions with FVRD staff; and
6. Debris assessment mapping and GIS base data (hydrology, provided by Emergency Management BC).

4 SITE OPINION AND ADVICE

Based on the hazard and risk assessment, it is our opinion that Site S-CR-12 is an Area of Immediate Concern (AIC), requiring further assessment, emergency work and potential mitigation measures to be implemented as soon as possible:

Emergency Works (ASAP):

1. Remove sediment within Pattison Creek downstream of the Sylvestor Road Bridge; and
2. Repair the right (west) bank of Pattison Creek to reduce the risk of a channel avulsion. The repair work includes installation of riprap erosion protection.

Long-Term Holistic Solutions (to current Codes and Standards):

1. Complete a hydraulic capacity assessment of the existing channel;
2. Restore the channel's capacity by:
 - a. Coordinating with MoTI, FVRD, and environmental regulators;
 - b. Removing sediment and vegetation downstream of Sylvester Road. Extents to be determined as part of the hydraulic assessment; and
 - c. Completing channel improvements to current Codes and Standards, based on the results of the hydraulic capacity assessment.

5 CLOSURE

Please contact Andrew Wiens at 403-863-4009 if there are additional questions or concerns.

Yours truly,

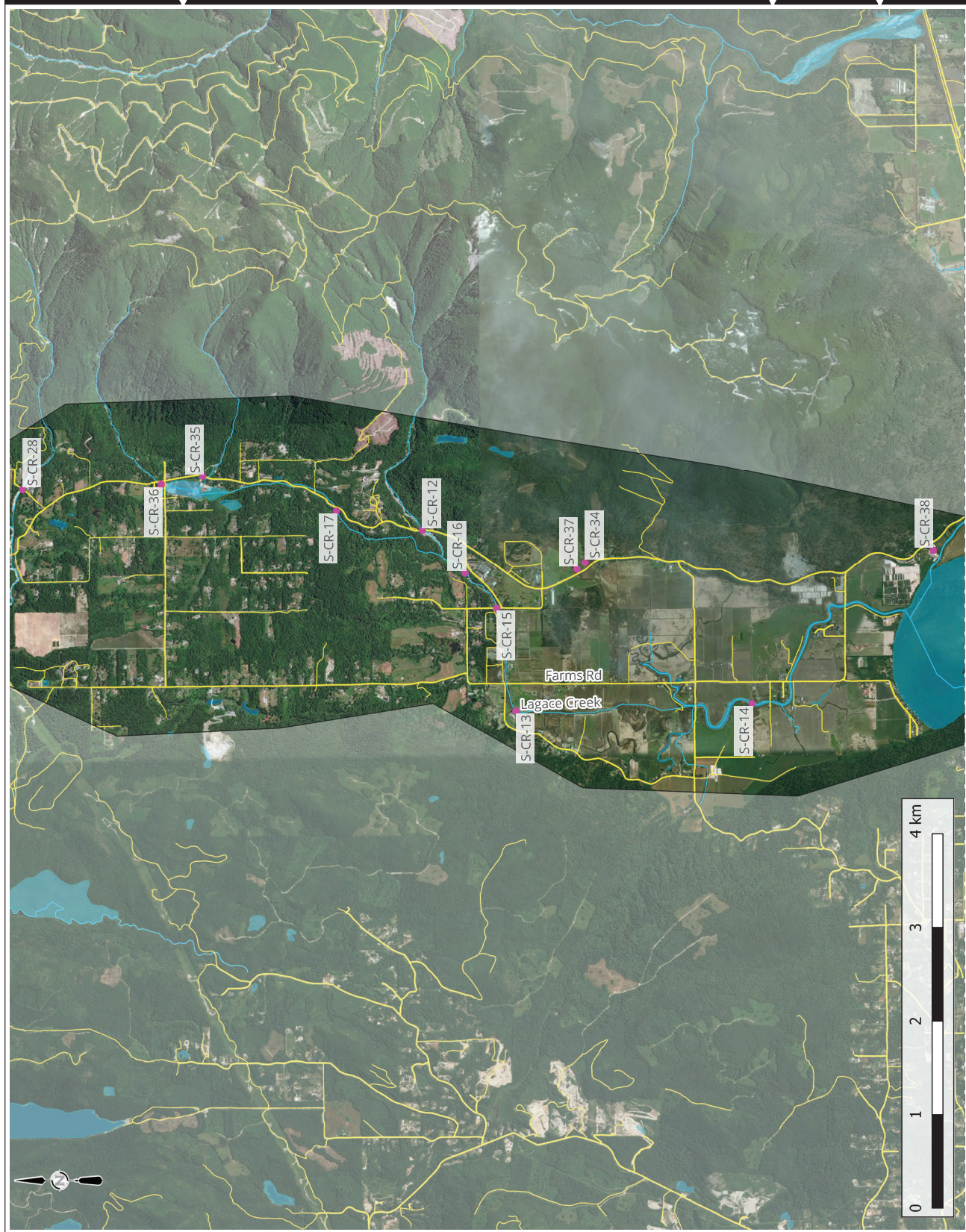
Prepared by:

Reviewed by:

Carmen Janzen, P.Eng.
Project Engineer

Andrew Wiens, P.Eng. (BC)
Senior Water Resources Engineer

CJ/AW/fd/jg



Legend

Roads

— Watercourse

Waterbodies

Problem Location (Site)

NOTE: AERIAL IMAGERY PROVIDED BY BING
AERIAL MAY NOT REFLECT CURRENT CONDITIONS
DUE TO FLOOD EVENTS SINCE THE DATE OF
COLLECTION

PROJECT LOCATION



FIGURE 1

PRICEWATERHOUSE COOPERS
BC MINISTRY OF ENVIRONMENT

WATERWAY SEDIMENT ASSESSMENT
PWC HATZIC PRARIE SITE OVERVIEW

SCALE	APPROVED	DATE	REV	DESCRIPTION

20222462-00
AS SHOWN
A. WIENS
20220531
A
ISSUED FOR FINAL



Associated
Engineering



Legend

- Roads
- Watercourses
- Waterbodies
- Problem Location (Site)

NOTE: AERIAL IMAGERY PROVIDED BY BING
AERIAL MAY NOT REFLECT CURRENT CONDITIONS
DUE TO FLOOD EVENTS SINCE THE DATE OF
COLLECTION

PROJECT LOCATION



FIGURE 2

PRICE WATERHOUSE COOPERS	20222462-00
BC MINISTRY OF ENVIRONMENT	AS SHOWN
WATERWAY SEDIMENT ASSESSMENT	A. WIENS
PW/C SITE S-CR-12	20220427
PATTISON CREEK AT SYLVESTER RD BRIDGE	A
AE PROJECT No.	ISSUED FOR FINAL
SCALE	
APPROVED	
DATE	
REV	
DESCRIPTION	



IF NOT 25 mm ALIQUOT SCALES

SCALE(S) SHOWN ARE INTENDED FOR THE (1:1000) SIZE DIMENSIONS THAT ARE NOTED OTHERWISE

PLOT DATE: 04/26/2022 07:10:05 PM
DRAWN BY: [Name] CHECKED BY: [Name] DATE: 04/26/2022 07:10:05 PM

Enclosure A – Risk Matrix

Risk Evaluation and Response						
	Consequence Rating	Very Low	Low	Medium	High	Very High
Indices	Public Health and Safety	Minor disruption to few.	Minor, short term disruption to local community or moderate disruption to few.	Moderate disruption to local community, or substantial disruption to few.	Moderate, long term disruption to local community.	Substantial, long term disruption to region.
	River Capacity	Flow contained within the channel	Flow temporarily floods adjacent land	Flow floods adjacent lands resulting in prolonged flooding	Partial avulsion of flow resulting in flooding, erosion and scour damage to adjacent land and infrastructure	Full avulsion of flow resulting in flooding, erosion and scour damage to adjacent land and infrastructure
	Environmental	No noticeable loss or deterioration of habitat, species, unique landscapes, or culturally valued sites.	Small, short term loss or deterioration of important, unique, rare, or endangered habitat, species, landscapes, or culturally valued sites. Moderate, recoverable loss or damage of less valued habitat, species, landscapes, or sites.	Moderate temporary or small permanent loss or deterioration of important, unique, rare, or endangered habitat, species, landscapes, or culturally valued sites. Moderate loss or damage of less valued habitat, species, landscapes, or sites.	Moderate permanent loss or deterioration of important, unique, rare, or endangered habitat, species, landscapes, or culturally valued sites.	Major permanent loss or deterioration of important, unique, rare, or endangered habitat, species, landscapes, or culturally valued sites.
	Infrastructure	No infrastructure impacted	Impacts to infrastructure (minor erosion or scour, some debris accumulation, partial infilling, etc.) are not expected to have an impact of the operation of the infrastructure.	Impacts to infrastructure (erosion or scour, debris accumulation, infilling, etc.) leave infrastructure vulnerable	Impacts to infrastructure (erosion or scour, debris accumulation, infilling, etc.) should be repaired post-freshet	Impacts to infrastructure (erosion or scour, debris accumulation, infilling, etc.) will likely result in failure or irreparable damage to the infrastructure - repairs should commence pre-freshet
	Annual Exceedance Probability	Very Low	Low	Medium	High	Very High
Very Likely	>0.2	M	H	H	VH	VH
Likely	0.2-0.1	L	M	H	H	VH
Moderate	0.1-0.02	L	L	M	H	H
Unlikely	0.02-0.005	VL	L	L	M	H
Very unlikely	<0.005	VL	VL	L	L	M
Risk Key		VH	Very High	Risk is unacceptable short-term (before next flood season); Risk reduction required		
		H	High	Risk is unacceptable medium-term; Risk reduction plan must be developed and implemented in a reasonable time frame		
		M	Medium	Risk may be tolerable; more detailed review required		
		L	Low	Risk is tolerable; monitor		
		VL	Very Low	Risk is broadly acceptable; no further review needed		

Enclosure B – Site Photos



Pattison Creek:
Viewing Upstream from Sylvester Road Bridge



Pattison Creek:
Viewing Downstream from Sylvester Road Bridge



Right Bank of Pattison Creek:
Downstream of Sylvester Road



Riprap on Left Bank upstream of Sylvester Road Bridge



Deposition in Pattison Creek below Sylvester Road Bridge

Appendix B



FIGURE 2

PRICewaterHOUSE COOPERS BC MINISTRY OF ENVIRONMENT	WATERWAY SEDIMENT ASSESSMENT		
PWC SITE S-CR-12		AE PROJECT No.	20222462-00
PATISON CREEK AT SYLVESTER RD BRIDGE		SCALE	AS SHOWN
		APPROVED	A. WIENS
		DATE	20220427
		REV	A
		DESCRIPTION	ISSUED FOR FINAL



Appendix C



November 21, 2022

Job Number: 2010103

Ministry of Environment and Climate Change Strategy
PO BOX 9047 STN PROV GOVT
VICTORIA BC V8W 9E2

Dear Ministry of Environment and Climate Change Strategy,

Re: Change Approval - Changes In and About a Stream on Carrott Creek

A Change Approval for the above application has been granted and a *Water Sustainability Act* Section 11(1) Changes In and About a Stream Approval document verifying this is attached.

This Approval is to support urgent flood recovery works following the November 2021 Atmospheric River event which caused numerous issues including channel avulsions within Carratt Creek, erosion of protection berms along the watercourse, and damage of nearby properties. The works authorized herein are to address further threats to property and public safety.

This Change Approval does not authorize entry onto private or Crown owned land. Permission of the affected landowner must be obtained and should be in writing for your protection.

This approval does not constitute authority of any other agency. The holder of this approval shall have the necessary permits from other agencies concerned prior to the commencement of the works authorized herein. The permit holder is required to adhere to all other applicable Provincial and Federal Regulations.

A copy of this Approval (and associated plans/drawings listed on this Approval) must be available for inspection, upon request, at any location where the authorized changes in and about a stream are being undertaken.

This Approval requires the oversight of an appropriately Qualified Professional. For the purposes of this authorization, that professional must be an applied scientist or technologist, acting alone or together with another qualified professional. He or she must be registered and in good standing in British Columbia with an appropriate professional organization constituted under an Act, acting under that association's code of ethics and subject to disciplinary action by that association.

The holder of this approval shall ensure that any proposed development and/or changes do not impact traditional or special sites in accordance with the Heritage Conservation Act or the ability of First Nation community members to participate in traditional activities on the land and water.

Archaeological sites (both recorded and unrecorded) are protected under the Heritage Conservation Act and must not be altered or damaged without a permit from the Archaeology Branch. The holder of this approval must advise everyone who will be involved in ground-disturbance and construction that if archaeological materials are encountered, activities must be halted, and the Archaeology Branch contacted at 250-953-3334 for direction.

Section 105 of the Water Sustainability Act gives the recipient of this notice the right to appeal my decision. You may file an appeal within 30 days of the date indicated on this letter. Information on filing an appeal can be found on the Environmental Appeal Board WEB site at <http://www.eab.gov.bc.ca/>.

If you have any questions or concerns regarding the document issued or the content of this letter, please feel free to contact the South Coast Office at WaterActReferrals.LowerMainland@gov.bc.ca.

Sincerely,



Malissa Smith
Assistant Water Manager

Enclosure(s)



November 21, 2022

File Number: 2010103

APPROVAL

WATER SUSTAINABILITY ACT - Subsection 11(1) and 11(2)
(Changes in and about a stream)

The Ministry of Environment and Climate Change Strategy

is hereby authorized to make changes in and about a stream as follows:

- (a) The name of the stream is Carratt Creek.
- (b) The Changes to be made in and about the stream are:
 - 1. Excavate approximately 65,000 cubic meters of sediment and debris over an area of approximately 32,700 square meters over the full width of the channel to an average depth of approximately 2 meters along a 260 meter reach downstream of the bridge and 900 m upstream of the bridge;
 - 2. Removal of debris Jam;
 - 3. Bank restoration using imported fill placed at a slope of 2 horizontal to 1 vertical;
 - 4. Dike Restoration;
 - 5. Construction of a berm at the location of the channel avulsion;
 - 6. Approximately 700 meters of riprap erosion protection; and
 - 7. Installation of a temporary HESCO barrier on Crown Land to redirect surface flows into Carratt Creek.

All Within Lot 6, Plan 38835; and Lots 14 and 15, both within Plan 52158; and Lot 7, Except: Parcel A (Exp Plan 39603), Plan 38835, all within Section 31, Township 31; and Legal Subdivision 14, Section 33, Township 3, Range 2, W6M, Except Part Subdivided by Plan 24872, all within New Westminster District; as held under the attached Permit Over Crown Land No. 29581.

- (c) The works authorized in this Approval shall be completed on or before March 31, 2023.

- (d) Work in the stream and stream channel shall occur only during the periods outlined below, so that the fisheries interests are protected:
1. Instream work during the reduced risk instream work window shall occur during the period of August 1 to September 15; or
 2. Based on project justification and risk, instream work outside of the reduced risk instream work window (as stated above), subject to the following:
 - i) An appropriately qualified professional shall provide advice to the holder of this Approval on the timing of the work based on the nature of the works, environmental values (including fish, amphibians, wildlife, any listed species present), water quality, channel stability, weather conditions, water levels, and any other relevant factors); and
 - ii) The Qualified Professional shall also provide additional construction mitigation advice to the holder of this Approval, and daily or full-time supervision of all work in or near the stream; and
 - iii) Work must be timed and planned appropriately, the stream must be completely dry or have marginal flows for the duration of the construction activities; and
 - iv) The advice of the Qualified Professional on construction timing (as per (i) above) and mitigation measures (as per (ii) above), as well as the timing of work and the presence of the Qualified Professional, must be documented in writing. This documentation must be submitted as part of the post construction reporting for this project.
- (e) All works shall be completed within the designed project footprint and in accordance with the following:
1. Preliminary Site Assessment of Potential Areas of Immediate Concern PWC Site ID: S-CR-28 – Carratt Creet at Carratt Road Bridge, Hatzic, BC, prepared by Associated Engineering, June 24, 2022
 2. Revised for Section 11 Approvals Engineered Drawings Titled Waterway Sediment Assessment Proposed Emergency Work S-CR-28 Carratt Creek, prepared by Associated Engineering, dated November 4, 2022
 3. Environmental Management Plan, prepared by Associated Engineering, dated October 2022
- (f) All work shall be carried out in accordance with the “Requirements and Best Management Practices for Making Changes In and About A Stream in British Columbia” (2022). The Provincial guidance document can be found at the

following link: <https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/working-around-water/wsa-cias-requirements-bmps.pdf>

- (g) The holder of this Approval must hire an appropriately Qualified Professional to conduct Environmental Monitoring on all in-stream works authorized under this Approval. The Qualified Professional is responsible for observing the methods of construction and preparing information and reports on the compliance of the construction activities. The Qualified Professional shall:
1. Ensure all best management practices and mitigation measures are in place to avoid and minimize environmental impact on the land and on fish and fish habitat of the stream.
 2. Where applicable, assist in the isolation of the stream prior to the commencement of works.
 3. Implement and ensure erosion and sediment control measures are constructed, installed, and maintained appropriately for the full duration of instream works.
 4. Supervise all instream works authorized under this Approval.
 5. When the works involve temporary diversions to isolate the work site,
 - i) Monitor all diversion works daily to ensure pumps & flow bypasses are in proper working condition;
 - ii) Ensure diversion works that include pump intakes be screened for fish and aquatic species in accordance with the “Interim code of practice: End-of-pipe fish protection screens for small water intakes in freshwater” (Fisheries and Oceans Canada, 2020); and
 - iii) Ensure fish are prevented from entering the works.
 6. When the works involve dewatering or isolation of flow and the stream is known or suspected to contain fish and/or amphibians,
 - i) Attend the site prior to conducting any instream works to complete fish and wildlife search and salvage(s);
 - ii) Obtain any permits needed prior to undertaking the salvage(s); and
 - iii) Inspect the extraction area for fish stranding at least once after water levels have declined.
 7. Be granted authority to stop the work authorized under this Approval if deemed necessary to address risks to the environment. The Qualified Professional or their designate (specified in writing) must be on site during all phases of construction in and around the stream to ensure this component is upheld.
 8. Report any spills including detailed information such as time of day, staff involved, nature, cause, and degree of spill, recovery process deployed, and agencies notified which must include the Dangerous Goods Incident Report 24-hour phone line at 1-800-663-3456.

9. In the event of an environmental incident or non-compliance with any of the terms or conditions of this Approval, an appropriately Qualified Professional must immediately mitigate the situation. Within 48 hours, each incident must be reported to the Water Manager at SouthCoastWSAReporting@gov.bc.ca with the approval number in the subject line. The incident report shall describe mitigation measures employed and a rationale as to why works have resumed, or the next steps required before works may resume. The holder of this approval must follow the advice of the appropriately Qualified Professional.
- (h) Upon commencement of the project, work shall be pursued to completion as quickly as possible.
- (i) All proposed works shall be completed in isolation of the stream flows.
- (j) All equipment and machinery used in or near the stream channel:
1. Must be in good operating condition and free of leaks, excess oil and grease;
 2. Must have a spill containment kit readily accessible on-site; All staff must be trained in handling and applying a spill kit appropriately to any spills/incidents;
 3. Refueling must occur a minimum of 30 metres away from all streams; and
 4. Must use environmentally sensitive hydraulic fluids which are non-toxic to aquatic life and which are readily or inherently bio-degradable.
- (k) Sediment and Erosion Control measures to prevent the release of silt, sediment or sediment-laden water must be in place before starting works that may result in sediment mobilization the satisfaction of the environmental monitor, or if the channel is dry, erosion and sediment control materials must be on site and ready for deployment if required.
- (l) Care shall be exercised during all phases of the work to prevent the release of silt, sediment, sediment-laden water, raw concrete, concrete leachate, or any deleterious substances. All control measures must meet or surpass the Requirements and Best Management Practices for Making Changes in and About a Stream in British Columbia (2022). and the "Land Development Guidelines for the Protection of Aquatic Habitat" (Fisheries and Oceans Canada and the British Columbia, 1993).
- (m) All excavated material and debris shall be removed from the site or placed in a stable area above the high water mark of the stream. Mitigative measures must be applied to protect the excavated material and debris from erosion and reintroduction into the watercourse. These measures may include covering the

material with erosion blankets, seeding and planting with native vegetation, or as otherwise directed by a Qualified Professional.

- (n) All disturbed areas of the banks of the stream shall be restored using native vegetation suitable for the site conditions.
- (o) All rock used in the works shall be clean and free of sediment producing material, durable, non-acid generating and suitably graded.
- (p) The Creek alignment should be maintained and in no case should the excavation increase the overall width of the channel. No over excavation of the channel is permitted.
- (q) The finished channel should have a gentle U or V shape in the cross section with the stream bed left in a reasonably smooth state with no depressions that could strand fish.
- (r) The final bottom substrates should consist of minus 6-inch gravel similar to the composition of the excavated material. If fine grained soils such as clays and silts are encountered in the stream bed they should not be disturbed, and the depth of excavation should be adjusted to maintain a layer of gravel covering these substrates.
- (s) Large boulders and large woody debris should be retained in the channel for fish habitat where possible and under the direction of a qualified professional.
- (t) The holder of this Approval must provide a detailed post-construction report no later than December 1 in every year that works were completed. The report must be submitted by email to SouthCoastWSAReporting@gov.bc.ca and to the People of the River Reporting Office, with the approval file number listed in the subject line of the email and the title of the report. The report shall include a signed statement from an appropriately Qualified Professional summarizing:
 - 1. The in-stream works undertaken;
 - 2. The timing of those works;
 - 3. The total in-stream area directly affected, including a map highlighting the specific areas sediment was removed in each year;
 - 4. As-built drawings of the final works constructed;
 - 5. The quantity of gravel removed;
 - 6. Representative site photographs;
 - 7. Summary of aquatic species salvaged, if/where relevant;

8. Whether or not they observed or were otherwise aware of any non-compliance with the terms and conditions of this Approval; and
9. A description of any environmental incidents, non-compliance or other difficulties, and how these were addressed and reported.



Malissa Smith
Assistant Water Manager



Province of British Columbia

Water Sustainability Act

PERMIT AUTHORIZING THE OCCUPATION OF CROWN LAND

Permit No.: 29581

The holder of this permit, Ministry of Environment and Climate Change Strategy (14475), whose Change Approval authorizes changes in and about a stream (Mechanic Creek), is hereby authorized to occupy Crown Land by constructing, maintaining and operating the works as authorized in the Change Approval 2010103.

- (a) The Crown land which is authorized to be occupied under this permit is a portion of Lot 6, Plan 38835; and Lots 14 and 15, both within Plan 52158; and Lot 7, Except: Parcel A (Exp Plan 39603), Plan 38835, all within Section 31, Township 31; and Legal Subdivision 14, Section 33, Township 3, Range 2, W6M, Except Part Subdivided by Plan 24872, all within New Westminster District, the location of which is shown approximately on the plan attached to the said Change Approval.
- (b) The approximate dimensions of the Crown Land authorized to be occupied under this permit, are for: Works 2000 metres in length by 3 metres in width, having an area of .6 hectares.
- (c) Prior to cutting, destroying or clearing of any timber necessary to construct, maintain and operate the said works or the clearing of the said lands which may be flooded, the permittee shall apply for and obtain a licence to cut timber from the Ministry of Forests, District Manager. The amount of stumpage, royalty and/or compensation payable to the Crown in respect of trees, including merchantable or young growth, cut, removed, damaged, or destroyed by the permittee, shall be the sum or sums fixed by the Forest Service of the Province of British Columbia.
- (d) This permit is appurtenant to the land, mine, or undertaking to which the aforesaid Change Approval is appurtenant.
- (e) This permit shall become void if the Change Approval with respect to which the permit is issued should terminate, be abandoned or cancelled, or amended so as to render this permit unnecessary.
- (f) This permit is issued and accepted on the understanding that the permittee shall indemnify and save harmless the Government of the Province of British Columbia for all loss, damage to works, cost or expense suffered by the permittee by reason of the Crown

land or any portion thereof being submerged or damaged by erosion or otherwise affected by flooding.

- (g) The holder of this permit shall not be entitled to compensation if the Crown grants permits to other persons to occupy the land affected by this permit.
- (h) In the event of a dispute at any time with respect to the area or boundaries of the land affected by this permit, the holder shall, at his own expense, have the said land surveyed by a duly authorized surveyor.

A handwritten signature in black ink, appearing to read 'Malissa Smith', with a large, stylized loop at the end.

Malissa Smith
Assistant Water Manager

Appendix D



HERITAGE CONSERVATION ACT

APPLICATION FOR HERITAGE INVESTIGATION PERMIT

The undersigned hereby applies for a permit, under **Section 12.2** of the *Heritage Conservation Act*, to carry out a Heritage **Investigation** in accordance with the information requested on the reverse of this form.

Name: Sarah Fraser, A/Associate Deputy Minister	Company: Ministry of Forests, Lands and Natural Resource Operations and Rural Development (FLNRORD)
Address: 4th Floor, 545 Superior Capital Park, Victoria BC V8V 0C5	
Phone: 250-953-3334 (Archaeology Branch)	Email: Archpermitapp@gov.bc.ca

Permit expiry date:	May 31, 2023
Permit deliverables¹ due:	May 31, 2023

Financial responsibility for the assessment is assumed by the following proponent(s):

Name: Jeff Sheldrake, A/Assistant Deputy Minister, Coast Area	Company: FLNRORD
Address: 4th Floor - 2975 Jutland Road, Victoria, BC V8T 5J9	
Phone: (778) 974-5826	Email: Jeff.Sheldrake@gov.bc.ca

Name: Brent Persello, Environmental Services Manager	Company: Ministry of Transportation and Infrastructure (MoTI)
Address: 477 Columbia Street, Kamloops, BC V2C 2T3	
Phone: 778-362-4522	Email: Brent.Persello@gov.bc.ca

☒ Other Provincial Government or Local Government proponents with responsibilities for flood recovery activities may be added to this permit without an amendment, pending submission of a client certification and client endorsement, as appropriate, to the Archaeology Branch.

¹ Deliverables include: report(s), site records, shapefiles, repository acceptance as required – see Section 8

PERMIT APPLICANT'S CERTIFICATION

I certify that I am familiar with the provisions of the *Heritage Conservation Act* of British Columbia, and that I will abide by the terms and conditions listed herein, or any other conditions the Minister may impose, as empowered by said *Act*.

Permit Applicant's Certification

Date: December 14, 2021	Permit Applicant Name and title: Sarah Fraser A/Associate Deputy Minister, FLNRORD	Signature: 
--------------------------------	---	---

APPLICATION FOR HERITAGE INVESTIGATION PERMIT

Briefly summarize the project: This Multi-Assessment Permit (MAP) will support government's response to and recovery from the widespread damage caused by 2021's catastrophic rain events and resulting flooding and landslides in the south and coastal regions of British Columbia. Various Provincial Ministries and Local Governments are tasked with responding to emergency events, restoring infrastructure, cleaning up debris and environmental contamination, and maintaining public health.

The Associate Deputy Minister of the Ministry of Forests Lands and Natural Resource Operations (FLNRORD), South Area will hold the permit. Proponents will include representatives from FLNRORD and the Ministry of Transportation and Infrastructure (MoTI). Additional government proponents may be added to the permit without amendment. To expedite work, Ministries may undertake work for each other where that is more practicable (e.g., FLNRORD for MOTI projects).

The original permit study area is defined by the fifteen Natural Resource Districts affected by flooding (Figures 1-7):

Table 1. Natural Resource Regions and Districts included in permit

Area	Region	District	Figure(s)
North	Skeena	Coast Mountains	1
Coast	West Coast	North Island – Central Coast	1
		Campbell River	1
		South Island	1 & 2
	South Coast	Sunshine Coast	1
		Sea to Sky	1
		Chilliwack	1 & 3
South	Thompson-Okanagan	Cascades	1 & 4
		Okanagan-Shuswap	1 & 5
		Thompson Rivers	1

Area	Region	District	Figure(s)
South	Kootenay-Boundary	Selkirk	1 & 5
		Rocky Mountain	1 & 6
	Cariboo	100 Mile House	1
		Cariboo-Chilcotin	1 & 7
		Quesnel	1 & 7

As of November 26, 2021, the province has identified 14 landslides and 102 flood events (Figures 1-7) impacting MoTI infrastructure. While additional projects may be added to the permit by Notice of Intent by the Delegated Archaeologist, emergent situations with immediate threats to public or environment health and safety can be added to this permit by proponents without notice of intent, following approval by the Archaeology Branch.

The permit authorizes the investigation of archaeological sites, and areas suspected to contain archaeological sites, which may be impacted by ongoing weather-related impacts requiring emergency impact management, or by recovery work. Recovery work includes but is not limited to:

- relocation of debris and soil,
- slope and bank stabilization,
- removal of contaminated sediments and materials,
- cleaning and repair of infrastructure (i.e., fences, poles, ditches, culverts, road, bridges),
- clean-up of surface debris,
- geotechnical investigation,
- repair or construction of dykes or levees,
- construction of temporary structures, roads and facilities while repairs are completed,
- blasting, and
- gravel extraction.

Specifics about the nature and extent of works and affected infrastructure will be identified in the Notice of Intent, or, if in response to significantly emergent work, in the report summarizing the assessment.

The permit scope is broad, recognizing the nature of impacts and required work is not fully understood at the time of this application, but will unfold through the winter season. This is balanced with the need complete timely infrastructure repairs and clean up. The use of Archaeological Overview Assessments (AOAs) and Preliminary Field Reconnaissances (PFRs) to support and prioritize Archaeological Impact Assessment (AIA) efforts are encouraged in light of the volume of work that needs to be done. To support analysis of the impacts the 2021 floods had on archaeological sites, the final report will include the results of AOAs and PFRs. When appropriate, archaeologists have flexibility around the timing, nature and methods of the assessment (i.e., emergency, in advance, during

monitoring work, or on a post-impact basis) depending on the local conditions, type of site, safety, visibility and/or contamination. These considerations should be part of a workplan.

The permit structure is unique but considers the lessons and approaches of the Wildfire permits (2018-0375 and 2020-0034), to facilitate archaeological assessments following natural disasters on a provincial scale. This investigation permit, held by the Province, allows for assessments as and when-needed; government agencies who sign on as proponents may hire any number of eligible archaeologists to work under the permit. The archaeologist, referred to as a delegated archaeologist, is responsible for all of the permit's terms and conditions related to their contracted scope of work. Delegated archaeologists must meet eligibility requirements. Field Directors and Supervisors (per Bulletin 17) may be utilized by the delegated archaeologist, who is responsible for their work.

Where feasible, new land alterations will require assessment prior to construction/earth moving. If infeasible, a program of concurrent monitoring or post-impact assessment should be completed under this permit.

The Archaeology Branch must review and approve mitigation plans for all sites, including recommendations for systematic data recovery or additional HCA permits.

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1. FIELD PERSONNEL

The Archaeology Branch (the 'Branch') may approve the addition of Delegated Archaeologists without an amendment to the permit. Documentation of personnel roles by the Delegated Archaeologist will comply with [Bulletin 17](#) (e.g., roles and dates assumed).

Given the size and scope of the impacts, government agencies who sign onto the permit may contract a number of archaeologists to conduct assessments to work under permit to support the response to the 2021 fall floods. The archaeologists are referred to as delegated archaeologists because the responsibilities under the permit are delegated from the Province, who holds the Heritage Investigation Permit. Consequently, delegated archaeologists must be qualified and eligible to hold HCA permits in the project areas.

The proponents and delegated archaeologist(s) will consider comments from First Nations when making in-field decisions and management recommendations.

Additional comments: At the time of application, no Field Directors had been added to this permit.

Delegated archaeologists must be qualified and eligible to hold multiple permits in the culture area they are working in (i.e., not a novice permit holder; no overdue obligations).

2. PROPOSED PROJECT

This project is for:

☐

Research

☒

Resource Management

Maps that comply with Provincial [standards](#) are attached to this application. Attached maps include appropriate information (e.g., location of previous field studies, previously recorded archaeological sites, and/or modeled archaeological potential) as available.

Sector: Emergency Environmental Response

2.1 Location

Select land ownership type(s) and describe below.

Table 2. Location of Permit Area

Land Ownership	Description
☒ Other	<i>Locations affected by flooding and landslides under repair and remediation within the following Natural Resource Districts (Table 3; Figures 1-7), which may include private and Crown land</i>

Table 3. Natural Resource Districts of Permit

Area	Region	District	Figure(s)
North	Skeena	Coast Mountains	1
Coast	West Coast	North Island – Central Coast	1
		Campbell River	1
		South Island	1 & 2
	South Coast	Sunshine Coast	1
		Sea to Sky	1
		Chilliwack	1 & 3
South	Thompson-Okanagan	Cascades	1 & 4
		Okanagan-Shuswap	1 & 5
		Thompson Rivers	1
	Kootenay-Boundary	Selkirk	1 & 5
		Rocky Mountain	1 & 6
	Cariboo	100 Mile House	1
		Cariboo-Chilcotin	1 & 7
		Quesnel	1 & 7

2.2 Proposed Study Area

Describe project: Inventory and assessment of archaeological sites impacted by flooding and landslides as a result of 2021's catastrophic rainfall in southern and coastal British Columbia.

Are all locations to be assessed defined in this application?

☐ **Yes.** All spatial data (kml/kmz, shapefiles) submitted to the Branch via APTS.

☒ **No.** Explain how First Nations with an interest will be notified of proposed investigation areas:

The assessment locations are based on the extent of impacts from flooding, including areas adjacent required for repairs or clean up. At the time of application, additional “atmospheric rivers” are forecast, and further flooding events are anticipated in winter 2021/2022. As of November 26, 2021, the Province identified 15 landslides and 101 flood events, impacting MoTI infrastructure (Appendix 1; Figures 2-7), and more may be added as the extent of damage is identified.

Notifications will take the form of a “Notice of Intent” (NOI in accordance with the [Multi-Assessment Permit Policy](#)), with a minimum 30-day referral period, unless one of the following conditions occurs:

- 1) A project requires immediate action to support public or environmental health and safety,
- 2) A local consultation process with First Nations is established that waives or reduces the 30-day notification period

Note the following **additional requirements** for NOIs for this permit:

1. The NOI will clearly indicate the length of referral period.
 - Requests for expedited reviews will include a rationale.
2. NOIs will include a summary of recorded sites and related past archaeological studies. The summary will identify any concerns with the existing site record(s) for the project area.
3. NOIs will be sent to Indigenous Communities in the format they prefer, using their tracking numbers (when known), as well as via email to Archpermitapp@gov.bc.ca and archsiteform@gov.bc.ca, with the subject line “2021 Flood -NOI -**2021-0453**– Company - Project - <<Optional: unique identifier for company>>” to allow Branch staff to confirm the accuracy of the Provincial records in the vicinity of the project.
4. When AOAs or PFR studies have been conducted in response to these floods and landslides, a summary of those assessments will be included with the NOI, including mapping.
 - Non-permitted assessments relevant to the NOI (accessible by the delegated archaeologist) should also be included in NOIs.

☒ **Additional comments regarding permit area:** n/a

3. RELATED STUDIES

The following studies are known to exist within or near the proposed permit area: ☒

An Archaeological Overview Assessment (AOA):

- ☒ An archaeological predictive model

Details: Table 4 lists the GIS-based AOAs which can be accessed using the Remote Access to Archaeological Data (RAAD) by NRD. An AOA, developed for the Okanagan-Shuswap Natural Resource District, is under Provincial review, and an AOA for the Cariboo District, is under development and anticipated in 2023).

Table 4. AOAs within Permit Area

Area	Region	District	Archaeological Overview Assessment	Year
North	Skeena	Coast Mountains	An Archaeological Overview of the North Coast Timber Supply Area	2000
Coast	West Coast	North Island – Central Coast	AOA of Tree Farm License 25	2000
			Central Coast Land and Resource Management Plan AOA	1999
			GIS Modelling of Archaeological Potential for the TFL Forest Ltd. - Johnstone Strait Operation Area	2002
		Campbell River	Campbell River Forest District AOA	2007
		South Island	AOA Tree Farm License 44 Archaeological Potential Model	2009
			Archaeological Potential Modelling for the Capital Regional District	2008
			Checleset Bay and Outer Kyuquot Sound Cultural Heritage Resource Overview	2007
			City of Langford Archaeological Overview Assessment - Phase 1 Baseline Mapping	2007
			Archaeological Overview and Inventory of a Portion of Ditidaht First Nation	2001
			Hul'qumi'num Treaty Group AOA	2005
	South Coast	Sunshine Coast	n/a	n/a
		Sea to Sky	AOA of the Squamish Forest District	1997
		Chilliwack	Chilliwack Forest District AOA	1999
South	Thompson -Okanagan	Cascades	An AOA of Coldwater and Spius Landscape Units	2008
			Archaeological Overview Assessment Lillooet Forest District	1999
			Upper Similkameen Indian Band (USIMIL) AOA	2007
			AOA of a Portion of the Williams Lake Forest District	1998

Area	Region	District	Archaeological Overview Assessment	Year
South		Okanagan-Shuswap	Okanagan Timber Supply Area AOA (Salmon)	1997
			Okanagan Timber Supply Area AOA (Vernon)	1997
			Okanagan Timber Supply Area AOA (Penticton)	1997
		Thompson Rivers	AOA Northern Secwepemc Traditional Territory	1998
	Kootenay-Boundary	Selkirk	Archaeological Potential Mapping in Landscape Unit K11 Kootenay Lake Forest District	2009
			Arrow Timber Supply Area AOA	1996
			Boundary Timber Supply Area AOA	1997
			Columbia Forest District AOA	2008
			Columbia Forest District AOA	2007
			Columbia Forest District AOA	2008
			Columbia Forest District AOA	2006
			Landscape Unit K12 & K26 Meadow Creek AOA	2006
		Rocky Mountain	AOA of Landscape Units K12 and K26, K16-18 and K20-24, Kootenay Lake Forest District	2007
			AOA of Landscape Unit C20, Rocky Mountain Forest District	2008
			Cranbrook Timber Supply Area AOA	1997
			Moyie Lake AOA	2007
	Cariboo	100 Mile House	AOA Northern Secwepemc Traditional Territory	1998
		Cariboo-Chilcotin	Chilcotin Forest District AOA	1998
			AOA Northern Secwepemc Traditional Territory	1998
			AOA of a Portion of the Williams Lake Forest District	1998
		Quesnel	Quesnel Forest District GIS Model of Archaeological Potential	2009

☒ A desk-based assessment **Details:** See additional comments.

☒ Field studies. **Details:** Numerous studies have taken place within this area and will be considered in desktop assessments and field visits; see additional comments below.

AOAs and field studies which consider information from Indigenous Communities may contain more comprehensive information relevant to adequately assessing potential. Further, Indigenous Communities may have traditional knowledge and/or ethnographic studies [bookmark7](#) to share with archaeologists.

Additional comments:

Desk-based AOAs: It is expected that development-specific reviews will be used to evaluate and prioritize field visits and that those assessments will, at a minimum, check the Provincial Heritage Register (PHR), and regional AOAs by accessing RAAD, and previous permitted assessments (accessed via the Provincial Archaeological Report Library – PARL). Archaeologists are encouraged to contact the Branch's Inventory section (archsiteform@gov.bc.ca) for unprocessed site records. The results of previous assessments that overlap with the development should be incorporated into desk-based AOAs.

PFRs: AOAs may be informed by PFRs conducted by non-field directors who have appropriate archaeological training and experience. PFRs involve field survey of the project area to precisely map areas of archaeological sensitivity. Areas of archaeological sensitivity are defined by the observation of either:

- a) Archaeological sites (i.e., artifacts or features)
- b) Areas of Potential (AOPs), which likely to contain buried archaeological resources.

Archaeological sites and AOPs may be submitted to the Branch based on the results of a PFR². Archeological sites recorded as a result of the PFR must be reviewed by a field director to ensure that the appropriate information is collected to register the site

AOA/PFR Reporting: AOA or PFR reports used to identify recommend AIAs will be provided to the Branch and affected Indigenous Communities, and the results incorporated into the AIA report. For areas not assessed in the field due to a low potential assessment based on desktop and/or AOA model results, a rationale will be provided, for inclusion in the final report.

² Refer to the Branch's Site Form Guide (2021) and Mapping and Shapefile Requirements (2021) for additional details.

Table 5. Previous Field Studies Relevant to the Proposed Study

Type of Study	Direct Overlap with Development? (Y/N)	Distance, Direction from Proposed Development	Year Assessed	HCA Permit #	Comments Relevant to the Study
Investigation	Y	Various	2018-2020	2018-0275	Wildfire permits: adapting approach to support Province's responsibilities under HCA
Investigation	Y	Various	2020-Ongoing	2020-0034	

Additional comments: Numerous studies have taken place within this area and will be considered in desktop assessments and field visits.

Table 6. Previously Recorded Sites Relevant to Proposed Study

Proposed Development Component	Borden Number	Direct Overlap with Development? (Y/N)	Distance and Direction from Proposed Development ²	Site Type	Permit # of Previous Visits ¹⁰

Additional comments: As of November 26, at least 101 recorded sites are located within 1 km of MoTI infrastructure impacted by landslides and floods (Appendix 2: Archaeological Sites and MoTI infrastructure); while MoTI's projects do not presently overlap with any recorded sites, protected (unrecorded) resources may be present.

4. GOALS AND OBJECTIVES

4.1. Goals and Objectives

Specify proposed research goals:

This permit will support Provincial and Local Governments' response to manage and protect archaeological sites during remediation of lands affected by flooding and landslide events from 2021's catastrophic rainfall. Archaeological sites will be identified and assessed for significance and impacts, and management recommendations made. Emergency impact management response to ongoing impacts, or to support infrastructure, may be initiated without delay. The impacts of recovery from 2021's catastrophic flooding will be summarized in the final report. Archaeological assessments will be completed in advance of development or recovery activities where feasible. Given the post-impact environment, impacts to public and environmental health and safety, and challenges with worker safety and site visibility, the delegated archaeologist is authorized to implement the most effective

timing and methods for investigation.

4.2 Significance of Proposed Project

Describe significance of study: This permit approach is novel, by authorizing multiple proponents and archaeologists. This approach is intended to remove barriers associated with permitting for a project of unprecedented scope and urgency, allowing multiple government agencies to work together using several archaeological firms to mitigate impacts to archaeological sites. The final report will serve to summarize the impacts and consequences of the 2021 floods on archaeological sites.

4.3 Expected Outcomes:

Describe anticipated results: The assessments may result in the identification of new sites, as well as record the impacts to known sites. Management recommendations will be made for ongoing impacts, and the assessments will consider the impacts of future remediation actions. Salvage may be undertaken of sites under threat.

It is not expected that sites will be fully analyzed under this permit, unless flood clean-up efforts or infrastructure rehabilitation will result in permanent, unavoidable impacts to archaeological sites, and conditions allow for assessment.

5. METHODS

The delegated field director(s) will consider and document comments and concerns from Indigenous Communities when making in-field decisions and developing management recommendations under this permit.

Describe how areas will be selected for investigation:

All assessments are conducted at the request of the proponent(s), in accordance with a contracted scope of work, at locations impacted by flooding, landslides, or other events following the 2021 atmospheric rains.

Emergency response will be initiated to address ongoing, direct impacts to archaeological sites from flooding that must be undertaken to mitigate ongoing destruction. Projects may be prioritized based on public safety.

Other projects will be selected for assessment using a combination of GIS-based AOAs, desk-top AOAs, PFRs, advice from Indigenous Communities or archaeologists, or upon advice from the Branch. Ideally, areas identified to have high potential for archaeological sites will be surveyed in advance of remediation activities. If the PFR is completed by an experienced technician, any archaeological sites recorded as a result of the PFR should be reviewed by a field director to ensure that the appropriate information is collected to register the site. Similarly, under the direction of a field director, diagnostic

artifacts, formed tools, and other cultural material may be collected.

It is anticipated most assessments will be limited to a defined development footprint (e.g., bridge replacement, fenceline, salvage polygon) in areas of high archaeological potential.

The field director is responsible to determine, implement, and document the methods employed and timing of assessment. For emergency works, the field director will determine the most effective site mitigation measure in consultation with the Archaeology Branch.

For remediation works such as removing debris or mud, the field director will determine the appropriate timing and method of inspection based on existing field conditions, taking safety and site visibility into consideration. If the local conditions do not allow for pre-impact inspection, then it is appropriate to monitor or conduct a post-impact assessment once the material has been cleared. If debris is suspected to contain archaeological material, it should be sampled as practical. The report will include a rationale for the timing of the assessment, and evaluation of the methods. Examples of factors considered to affect site visibility and worker safety include previous disturbance, debris, danger trees, mud deposit, moisture conditions, or soil stability. Assessments may also be delayed for those infrastructure projects requiring immediate replacement or remediation (e.g., installation of temporary bridges) to support public safety.

5.1. Archaeological Potential

Is archaeological potential a consideration?

☒ **Yes**

The assessment locations will be driven by flood and landslide recovery activities in conflict with known archaeological sites and areas evaluated to contain high potential. All in-field decisions about archaeological potential will be documented. Areas with low potential for archaeological resources may also be examined.

Potential for archaeological resources will be consider the following criteria.:

- Geological, terrain, or microtopographical features
- Proximity to potable water
- Slope
- Aspect
- Elevation
- Forest cover
- Soil drainage
- Proximity to sheltered areas (from wind or rain)
- Proximity to areas of potential cultural significance
- Shore lines
- Proximity to cultural resources (e.g., trails; berry patches; fishing sites; travel corridors)
- Any of the above conditions that existed in the past that are not present today (e.g., paleo landscapes, landforms obscured by agricultural practices)
- Previously recorded archaeological or heritage sites
- Areas identified by First Nations or other interested parties
- Significant disturbance

- Timber with potential for CMT sites
- Other (e.g., GPR)

5.2. Field Recording

Field notes will record in-field observations. Survey coverage and points of interest will be recorded (e.g., with a GPS or total station). A camera will be used to document in-field observations. When sites are identified, they will be mapped per Branch [requirements](#)³.

Notes will document information provided by First Nations and observations to support the rationale behind in-field decisions regarding survey coverage, subsurface testing methods, and preliminary management recommendations for sites.

Polygons of negative subsurface test locations and areas of potential will be created for submission to the Branch. Notes will sufficiently describe sites to include necessary information to complete a site form⁴ to Provincial standards.

5.3. Survey Coverage

Does this study include survey coverage? ☒ **Yes**

The study area will be surveyed for archaeological features (e.g., cultural depressions, trees with modifications that may pre-date AD 1846), and areas exhibiting potential for archaeological resources (e.g., landforms and exposures). Surveyed terrain will be mapped in relation to the development footprint and described in the report.

Survey coverage will minimally address areas of anticipated archaeological potential identified by the AOA study (where they exist) and may be modified based on in-field observations. Areas of potential that are not surveyed will be mapped and rationale provided for why the area was not assessed and why it was evaluated to contain potential.

Select all that apply:

- ☒ Traverses or transects with crew members spaced at 10 m intervals or less in areas of high potential; at less than 25 m intervals in areas of moderate potential; at 10-40 m intervals in areas of low archaeological potential. **Additional details regarding approach:**
- ☒ The entire development will be surveyed with crew members spaced in less than 5 m intervals. **Additional details regarding approach:**
- ☒ Areas with high potential for surface artifacts will be surveyed with crew members spaced at 1-5 m intervals. **Additional details regarding approach:**
- ☒ Areas with terrain that has low potential for archaeological resources other than CMTs will be surveyed with crew members spaced at 5-50 m intervals. **Additional details regarding approach:**

³ Defining Archaeological Site Boundaries & Protection Status: https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/natural-resource-use/archaeology/forms-publications/defining_archaeological_site_boundaries_protection_status.pdf

⁴ Notes and photos are required by repositories and may be recalled by the Branch

☒ Areas of low archaeological potential may not be surveyed or will be surveyed en route to areas of high archaeological potential. **Additional details regarding approach:**

☒ **Other (provide details and rationale):** Areas subject to mass wasting events may not be accessible for systematic survey and/or sediments containing archaeological material displaced. The field director will develop a survey sampling plan to address local conditions.

Additional comments: Safety and environmental conditions will influence appropriate survey strategies. The Field Director will explain why the survey coverage is appropriate, based on local conditions. It is understood that the project area may be loosely defined, based on the nature of the impacts (e.g., debris flow). The following guidance is intended to inform scope and level of effort:

- Where site material is found, inspection traverses and testing may be expanded up to 25 meters beyond the immediate permit area, except where impractical due to safety concerns or the limit of the permit authorization is reached (i.e., private or federal land), or where the level of assessment will extend the intent of this permit (e.g., 25 m along a linear development).
- If site material is observed to continue beyond the scope of the project area (e.g., 25 meters), detailed site mapping should stop and the boundary estimated, with recommendations for future work and appropriate AOP established.
- If site material is not observed in areas of adjacent potential, an AOP should be established.

It is recognized that pedestrian survey may not be feasible in flooded areas, and that surveys may require boats or other means to access or view project areas. Images from drone footage may be incorporated into PFRs.

Further to issues of access to subsurface deposits, the use of remote sensing technology such as ground penetrating radar may be considered in consultation with the Archaeology Branch.

5.4 Subsurface Testing

All AOPs and negative Subsurface Test Areas (STAs) will be mapped and shapefiles will be provided to the Branch, per the [Mapping and Shapefile Requirements](#) (i.e., shown as polygons with the number of tests, or each individual test shown).

Stratigraphic and subsurface descriptions will be recorded in the field and summarized in the report(s). Special attention will be paid to significant results, variations, and/or changes.

Reports will describe why the Field Director determined the sediments are culturally sterile. When the depth of culturally sterile deposits in the test was not determined, a rationale must be provided in the report.

The effectiveness of testing at each STA will be determined by a quantitative and/or qualitative evaluation of research. Assumptions about the type, size and artifact density of potential target sites will be described in this evaluation. Given the scope and intention of this permit, some STAs will not be fully assessed, but the full area should be reported as an AOP.

While the Branch generally recommends subsurface testing Areas of Potential (AOPs), they may be an appropriate approach under this permit. When not subjected to testing, reports will describe observations (e.g., microtopography, nearby drainages, vegetation); indicate how these characteristics affected the evaluation of potential; and provide management recommendations to avoid impacts to the AOPs until they can be fully assessed.

Select as appropriate:

- ☒ Tests will minimally measure 0.123 m² (e.g., 35 cm a side shovel test). Sediments will be screened through ¼" mesh or smaller. Tests will be excavated until culturally sterile sediments are confirmed (e.g., glacial till). **Additional details regarding approach:** none
- ☒ Soils believed to contain cultural materials will remain within the site boundary⁵ and described in the site form and report. **Additional details regarding approach:** none
- ☒ STAs will be tested at 5 m intervals or less, within the STA. The field director will provide a rationale in instances where a different interval of testing is employed. **Additional details regarding approach:** none
- ☒ Soil probes may be used to confirm the presence of cultural deposits (e.g., midden; stratigraphy within cultural depressions). However, only mechanical augers or shovel testing can be used to demonstrate cultural deposits are not present to support site boundary definition. **Additional details regarding approach:** none
- ☒ Mechanical augers may be employed. **Describe approach:** Augers will be up to 40 cm in diameter, all sediments will be screened.
- ☒ Other methods will be followed. **Describe:** Given the variety of impacts and settings anticipated by the permit, the Field Director will consult with the Archaeology Branch if alternate methods are proposed.

Additional comments: Where wet screening is appropriate (e.g., waterlogged sediments) all displaced sediments will be screened through an appropriate sized screen (e.g., 1/4" or smaller). Sediments will be placed in the screen and washed through using a hand-held hose with a variable control nozzle. Contextual information will be maintained to ensure that levels, layers, and features are separated within evaluative units or shovel tests and cultural material recovered in the screens will be bagged by level, layer, and unit/test. Care must be taken to avoid environmental degradation from siltation in the screening area.

⁵ Cultural deposits must be kept within site boundary and permit area

5.5 Wet Sites

Are wet sites anticipated?

- ☐ No. **Provide rationale:**
☒ Yes. **Describe specific methods:**

Additional comments: In the event a wet site is encountered, and safety conditions allow, the location will be stabilized and kept in a water-logged state in place until a research plan can be developed and appropriate stabilizing treatment of artifacts and repository confirmed (see Bernick 2019 for examples).

If the materials cannot be left in place due to risk of damage, they will be recovered and preserved by suitably qualified personnel with access to facilities for the recovery and passive conservation of materials pending permanent stabilization treatment. Wet site Specialists must be identified in advance. The Archaeology Branch will be contacted immediately to provide advice on procedures and consultation with First Nations when wet sites are found.

5.6 Machine-Assisted Investigations

Would you like to include provision for mechanical excavation (i.e., backhoes)?

- ☒ Yes (see below).

Machine-assisted inspection will comply with appropriate WorkSafe BC Requirements.

Machine-assisted inspections will be directed by a qualified archaeologist (i.e., field director).

In the event ancestral remains are identified, methods are described in Section 6.

Select as appropriate:

- ☒ Toothed buckets may be used to remove obstructions (pavement, boulders, etc.) prior to reaching potentially culture-bearing sediments. **Additional details regarding approach:** none
- ☒ Potentially culture-bearing sediments will be removed with a finishing bucket, in maximum 10 cm vertical lifts, to allow the archaeologist to observe any exposed features or intact deposits and collect artifact provenience in the most precise manner possible. The horizontal extent of lifts will not exceed 3 m. **Additional details regarding approach:** Field Director will document the extent of lifts, and describe circumstances where these increments are exceeded.
- ☒ The Field Director may use discretion to determine the amount of material to be processed; the report will include a summary of methods and the rationale behind in-field decisions. **Additional details regarding approach:** Processing will be limited to post-glacial deposits, where discernable. It is expected that at least 25% of material will be processed, unless required for immediate return to the location.

☒ In the event intact archaeological deposits or features are identified, mechanical excavation will cease, and excavation will proceed by hand or other methods in consultation with the Branch. **Additional details regarding approach:** Manual excavation will only proceed where safe and practical to do so. Site avoidance or other methods of investigation should be considered to make the area accessible.

☒ When non-intact archaeological deposits are identified, up to 3m³ sediments will be excavated by hand. **Additional details regarding approach:** Where deposits are in excess of 3 m³, manual excavation should be conducted on a sampling basis with 100% of excess mechanically excavated site material screened or raked.

☒ When greater than 3 m³ of archaeological deposits are identified, the Branch and First Nations will be contacted. Work may not proceed without Branch approval. **Rationale and additional details regarding approach:** Given the variety of site types that may be encountered, it is expected that methods and approach will be vetted by the Archaeology Branch prior to implementation.

☒ Mechanically-displaced deposits will be inspected for cultural material (e.g., screening). **Describe methods:** Sediments suspected to contain archaeological material will be screened or raked on a sampling basis not to exceed 25% of post-glacial sediments. Sediments known to contain archaeological material will be 100% screened, except where midden deposits and/or human remains are encountered. Stockpiling Archaeological sites is not an ideal long term management option. It is expected that stockpile sites will not be created except in circumstances such as ancestral remains, or where First Nations support the use of a stockpile, or in emergency situations to support project feasibility.

☒ Alternate methods. **Provide detail:** Drill and auger flights will be 100% manually inspected. Geotechnical testing, such as mechanical test pitting, will be monitored and sample screened up to 25% of post-glacial sediments

☒ This section requires further discussion not outlined elsewhere in this section of the application. **Describe:** While standard methods may be followed, due to the nature of disturbed sediments resulting from floods and landslides, the Field Director is authorized to modify methods as deemed appropriate and provide a rationale in reports.

The preferred option for machinery type depends on local conditions. Rubber-tire mounted machinery is typically of lower impact than tracked machines but may be less effective for rutting in wetted areas, slopes or loose soils. Track-mounted machinery may be equally effective where vegetation is present, and conditions are dry, or may be necessary for safety. The archaeologist will consider local conditions and proposed machine works when designing the assessment plan.

5.7 Winter Assessments

Will winter assessment be employed?

☐ No (delete rest of the text in this section and proceed to next subsection)

☒ Yes. **Choose as appropriate:**

☒ Where test locations were initially visited under snow and frost-free conditions and evaluated to contain archaeological potential for subsurface archaeological resources. Methods may include evaluative units and systematic data recovery using artificial heating or other methods approved by the Branch to create snow and frost-free conditions.

☒ Winter survey may occur in areas evaluated to contain low potential for all archaeological resources, except culturally modified trees.

☐ This project is located within the Fort Nelson and/or Peace Natural Resource Districts (i.e., the Northeast Natural Resource Region).

☒ **Other:** Winter assessments may be authorized for the purpose of geotechnical testing. Tests will be monitored, and excavated post-glacial sediments warmed and screened or raked.

Testing strategies (and confidence in testing) will consider the degree in which microtopography was discernable.

Select as Appropriate:

☒ Snow will be removed as necessary, exposing the ground.

☒ Tools (e.g., concrete saws) may be employed to cut frozen ground.

☒ Subsurface tests will be excavated by shovel and/or pick-axe, etc.

☐ Subsurface test soils will be collected and bagged individually by test unit.

☐ Subsurface tests will be numbered and mapped; soils will be kept separate.

☐ Provisions will be made to transport the soils to facilities for screening.

☒ Sediments will be thawed and screened through ¼" mesh.

☒ Remaining cleaned clasts from the collection screen will be removed and visually inspected.

☒ Evaluative units may be excavated when the ground is heated, using excavation methods as discussed elsewhere in this application.

☒ If topography is difficult to discern, systematic testing will be employed and the methods employed will be outlined in the interim reports. Testing at smaller intervals may be required.

☐ Other. **Describe:**

Additional comments: Situations not covered by the application should be discussed with the Archaeology Branch to determine appropriate assessment strategy (e.g., frozen mud and debris flows).

5.8 Site Recording

Sites will be mapped using measuring tape, compass, GPS, total station, or similar. Archaeological features (e.g., cultural depressions) will be measured, mapped, and photographed. Sites and significant artifacts will be photographed in the field and detailed in a photo log.

Recognizing that conditions may not be ideal for site recording, these standard methods may be modified in consultation with the Archaeology Branch.

5.8.1. **Boundary Definition**

☒ **Standard methods will be followed regarding the definition of site boundaries:**

Site boundaries may be defined by subsurface testing, the extent of the landform, or administrative boundaries (e.g., development boundary), per the [Defining Archaeological Site Boundaries](#) document.

When site boundaries are defined by subsurface testing, tests may be spaced 1-5 m apart on a grid, as appropriate. Additional testing may occur at the Field Director's discretion. Testing will continue until three negative tests are reached in each direction (e.g., cardinal or ordinal), unless the site boundary is defined by the landform and/or administrative boundary.

For larger sites, "back testing" may be applied. The specific methods will be described in the report.

Where the site is comprised of one positive test, a minimum of four additional subsurface tests will be placed 1 m around the test.

5.8.2. **Collection of Archaeological Material**

All recovered archaeological materials including human remains, faunal remains, other fragile artifacts (e.g., wet site materials), will be handled with sufficient care during excavation, recording, transport, cleaning, analysis and storage to ensure no additional damage or negative impacts occur to the collections during these processes per [Bulletin 26](#).

☒ Standard methods will be followed:

All archaeological materials from an archaeological context (e.g., artifacts, fauna) will be collected. Samples (e.g., radiocarbon, ethnobotanical) may be collected, as appropriate.

Exceptions:

- Large lithic scatters (>100 artifacts) may be sampled in consultation with the Branch; diagnostic artifacts will be collected, as well as artifacts at risk from proposed development or unauthorized collection.
- In midden contexts, all vertebrates and a representative sample of invertebrates will be collected;

- Fire Altered Rock (FAR) will be counted and weighed to the nearest 100 g in the field, but otherwise discarded. The location and distribution of FAR will be described, including by layer/level if appropriate.

Additional comments: It is anticipated that volumes of mixed material may be encountered. Stockpiling may be considered in exceptional circumstances based on the volume or nature of the material, such as ancestral remains. Stockpiling may be used as a temporary measure for project feasibility. The curation of stockpiles of site material is subject to approval of a management plan by the Archaeology Branch, and may require additional permitting.

5.8.3. **Flagging**

Will boundaries be flagged?

☐ No. **Provide rationale:**

☒ Yes. **Describe approach:** Sites will only be demarked in the field when required for impact avoidance during construction. All markings (e.g., snow fence, flagging) are considered temporary and specific to this project. No paint is to be applied to surface features for the purpose of site recording.

Additional comments: Given the variable ground conditions and potential for existing sites to be expanded or merged with new sites, it may be necessary to determine site boundaries after fieldwork is completed, in discussion with the Archaeology Branch.

5.9 CMT Survey

Are CMTs anticipated?

☐ No. **Provide rationale:**

☒ Yes. Following [Bulletin 27](#)⁶, CMT sites will be recorded and samples will be analyzed in accordance with Branch standards⁷. Rationale and details regarding a sampling strategy⁸ will be discussed in reports. CMTs presumed to post-date AD 1846 will be fully recorded and may be provided to the Archaeology Branch for addition for the Informed Contributor's Layer (ICL).

Additional comments: CMTs exposed landslides may be damaged or destroyed, but may be recognizable.

⁶ https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/natural-resource-use/archaeology/forms-publications/bulletin_27_cmt_guidelines.pdf

⁷ Defining Archaeological Site Boundaries; CMT Handbook

⁸ I.e., Muir and Moon 2000

5.10 Evaluative Units

5.10.1. **Systematic Data Recovery**

Will methods include systematic data recovery?

☐ No

☒ Yes

Describe under what circumstances evaluative units will be excavated: Up to 5 evaluative units may be excavated to assess the nature and extent of the site, where remediation plans do not allow for 100% site avoidance. If more than 5 evaluative units are considered necessary, the Archaeology Branch will be contacted prior to implementation to determine next steps: additional units may be authorized by the Archaeology Branch as part of an emergency response, or, if time allows, the excavation may be subject to discussion with affected Indigenous communities.

☒ **Standard methods will be followed:**

Evaluative units may be excavated in stratigraphic layers or arbitrary levels (5-10 cm). Features will be excavated by stratigraphic layer. Within thicker layers, 5-10 cm arbitrary levels will be excavated as appropriate.

3D provenience for features and artifacts found in situ will be recorded and cultural materials collected. For each unit, an illustrative representation to scale for two adjacent walls and floor plans will be prepared and labelled as appropriate. Photographs will be taken at the completion of each layer. Stratigraphy will be recorded.

Where wet screening is appropriate (e.g., waterlogged sediments) all displaced sediments will be screened through an appropriate sized screen (e.g., 1/4" or smaller). Sediments will be placed in the screen and washed through using a hand-held hose with a variable control nozzle. Contextual information will be maintained to ensure that levels, layers, and features are separated within evaluative units or shovel tests and cultural material recovered in the screens will be bagged by level, layer, and unit/test.

Additional comments: The site setting may need to be stabilized prior to undertaking controlled systematic excavation using measures such as caissons, tents or retaining structures.

5.10.2. **Sampling**

☒ **Standard methods will be followed:**

If intact deposits are encountered, appropriate samples (e.g., radiocarbon, column, bulk samples) will be taken. Description of methods and analysis will be provided in the report.

The provenience of all samples will be recorded. Samples will be labeled appropriately.

When column samples are taken, the volume from each stratigraphic component should be 1 L unless otherwise specified in the report. The samples will be dried and screened through nested geologic screens. The contents of the screens will be sorted and weighed to the nearest 0.01 g.

Samples will be processed by a qualified individual before the report deliverables are due. Samples will be analyzed in the lab using methods appropriate for geological, palaeobotanical, zooarchaeological, or micro debitage analysis, which will be described in the final report.

When samples are not processed, they will be stabilized for long-term storage, and their lack of analysis rationalized in the associated report(s).

Additional comments:

5.11 Ancestral Remains and Burial Features

In the event partial or complete human remains or burial features (e.g., cairns and mounds) are identified in the field, nearby ground disturbance will cease. Ancestral remains and/or burial features will be protected in place. First Nations, the Branch, and other concerned parties will be immediately informed.

Where human remains of suspected forensic interest are encountered, local law enforcement and/or the Coroners Service will be notified.

☒ **Standard methods will be followed:**

Where suspected burial features are identified, the Field Director will record the rationale describing the basis for their identification. In addition to standard archaeological site recording human remains and burial features will be recorded to include, at minimum: horizontal and vertical extent, orientation and position, inventory of skeletal remains and grave inclusions, and integrity.

Where possible, basic osteological data will be recorded (e.g., minimum number of individuals, sex, age, stature, and any evidence of trauma, disease and cultural modification).

Fragmentary or isolated human remains identified during post-field analysis will be kept in secure storage pending final disposition.

In consultation with all concerned parties, efforts will be made to rebury the remains in an appropriate area within the archaeological site boundary, in an area unlikely to be disturbed in the future. If the reburial location is within or near the original archaeological site, it will be mapped and recorded on the site form under that Borden number.

If the proposed reburial location is not in the vicinity of the original archaeological site, consultation will occur with the Branch to discuss what records are required.

In its description of the site, the report will cite the appropriate classification scheme(s) (e.g., Mathews 2006).

5.12 Rock Art

If rock art is identified, it will be fully recorded (e.g., multiple overlapping photographs, sketches), whilst minimising damage, per [Bulletin 26](#)⁹. Rock art will not be subject to any procedure that involves physical contact with the image to make a recording of the image.

Additional comments: The location of rock art and its associated images are often considered sacred and confidential by First Nation communities; caution must be exercised accordingly to ensure the respectful collection and distribution of information. Photographs of features may be withheld from the interim and final report if requested by Indigenous Communities. Photographs are required for site records.

5.13 Significance Evaluation Scheme

Site significance will be evaluated following Section 3.5.2.2 and Appendix D of the [AIA Guidelines](#). Archaeologists are encouraged to consider additional information that First Nations may have that will inform the significance evaluation.

5.14 Assessing Impacts

Assessing impacts to archaeological sites will follow 3.5.2.3 and Appendix F of the [AIA Guidelines](#).

Mitigating Impacts

In order to determine the most appropriate mitigation plan, Field Directors will assign a low or high interpretive value to sites and compare that to the level of expected impact. While avoidance is always the preferred option, Table 7 summarizes the approach to be followed:

⁹ <https://www2.gov.bc.ca/gov/content/industry/natural-resource-use/archaeology/bulletins-policies>

Table 7. Mitigating Impacts to Sites

Proposed Disturbance ¹⁰	Low Interpretive Value ¹¹	High Interpretive Value
Light	Options include: no further work or, if warranted, monitoring or a post-impact assessment of the damaged portion of the site.	Monitoring or, if warranted, a post-impact assessment of the damaged portion of the site.
Heavy	Options include: no further work or, if warranted, monitoring or a post-impact assessment of the damaged portion of the site.	Any combination of systematic data recovery (SDR), additional subsurface inspection and/or monitoring, site protection measures.

Impacts may be mitigated through the use of geotextile fabric and overburden (e.g., clean fill), to temporarily protect archaeological sites from disturbance, under the direction of a Field Director.

A combination of recommendations (e.g., no further work; monitoring) can be proposed for sites with both low and high areas of interpretive value. Sites with high interpretive value, or activities not considered “urgent” may be subject to additional HCA permitting.

Any combination of emergency SDR, construction monitoring, site protection or post-impact assessment may be appropriate for sites (regardless of value) under immediate threat from a development that is required to mitigate further flooding or landslides.

6. METHODS AND TECHNIQUES FOR DATA ANALYSIS

Analysts must be qualified and named in report(s).

Select as appropriate:

☒ Ancestral remains will not be subjected to destructive testing nor out-of-Province analysis without approval from the Branch, following engagement with Indigenous Communities.

6.1. Artifact and Faunal Analysis

☒ **Standard methods will be followed:**

Artifacts will be sent out of the Province (even to other offices within the archaeological

¹⁰ Light impacts include activities like removal of surface materials with minimal land alterations; heavy impacts include road and bridge construction, and land clearing activities.

¹¹ Interpretive value will consider artifact density, presence of exotic materials, presence of faunal materials, formed tools, diagnostic artifacts, and archaeological features.

firm) only with the permission of the Branch; the archaeologist will also contact Indigenous Communities with an interest in the site. The request to send artifacts out of the Province will include an artifact catalogue, photographs of tools and/or diagnostics, the reason for export, the destination and the length of time they will be out of Province.

All artifact assemblages will be analyzed with the intent of defining site function, activity areas and cultural chronology if possible (see Clark 2010, Mitchell 1971, and others).

Lithic analysis will use an established system (e.g., Andrefsky 1998; Magne 1983). Interpretation of the assemblage will provide insight into technologies represented at the site (e.g., core reduction, pressure flaking, heat treatment, etc.).

Tools will be measured and illustrated or photographed, with technological attributes noted.

Raw material sourcing analysis will be completed, where appropriate.

Faunal remains will be analyzed to the most specific taxa possible by a trained individual with access to an appropriate comparative collection or reference materials. Faunal elements will be identified by taxa, element, and side if possible, and any relevant cultural modifications or natural taphonomic processes noted, **with the aim of answering questions on site formation processes, subsistence strategies, environment, season of occupation, etc.**

Additional comments:

6.2. Sample Analysis

☒ **Standard methods will be followed:**

Samples may be sent out of the province for analysis.

Where wet sites are encountered, monolith and/or specialist samples may be taken and processed.

Collected CMT samples (*i.e.*, stem rounds) will be analyzed. Per [Bulletin 27](#), magnification will be used to improve the confidence of the results of tree-ring counting. Comparative collections will be used as appropriate for dendrochronology analysis.

The lab results from radiocarbon analysis will be appended to the report and site form(s). The report will present calibrated and conventional/standard dates.

Unprocessed samples will be stabilized for long-term storage.

Additional comments: none

7. DISPOSITION OF CULTURAL MATERIALS

Collected materials from archaeological sites (e.g., wet site materials), will be handled with sufficient care during excavation, recording, transport, cleaning, analysis and storage to ensure no additional damage or negative impacts occur to the collections during these processes per [Bulletin 26: Treatment of Archaeological Materials](#).

The permit report and site form(s) will identify the repository. Additional repositories may be added to the permit **upon completion of the study**, when it is known where materials originated, and if special curation measures are required. Additional repositories will require an amendment to the permit, subject to referral with affected Indigenous Communities.

Table 8. Permit Repository

Contact Name: Dr Genevieve Hill	Repository: Royal British Columbia Museum
Address: 675 Belleville Street, Victoria, BC V8W 9W2	
Phone: 250-893-8019	Fax or Email: GHill@royalbcmuseum.bc.ca

All artifacts recovered under permit must be labeled with a provincial catalogue number; the Province must be advised of the final catalogue number under this permit when cataloguing is complete.

Sediments believed to contain cultural materials will remain within the site boundary and a location specified in the site form and report. Samples may be collected for off-site analysis.

CMT samples will be analyzed and retained in-office for one year after the expiration of the permit and discarded.

Once the project is complete, all cultural materials and supporting documentation must be transferred to the designated repository prior to the permit expiry date, per their standards for packing and transport. Confirmation of acceptance of artifacts, samples, and record submission by the repository must be provided to the Branch prior to the expiration of the reporting period.

Materials to accompany the archaeological collection include:

- submission letter with box inventory
- artifacts and digital catalogue
- field notes (original and digital copies, including maps and sketches)
- photographs and photo log (copies of prints, if any, and digital), and
- interim report and specialized analysis appended (hardcopy and digital copy).

Additional comments: In the case of ancestral remains, collection and handling will be under the direction of and in consultation with Indigenous Communities. Human remains and suspected human remains are to be respectfully left in situ until recovery and disposition plans are made and confirmed by the affected parties. In emergency situations, in consultation with the Archaeology Branch, human remains, including ancestral remains, may be recovered or location stabilized to prevent ongoing direct impacts. Recovered ancestral remains will be held respectfully, in the territory, until direction can be received.

8. REPORTING

Reports, maps, and site records will comply with Branch standards. Electronic versions of reports will be provided to Indigenous Communities with an interest in the study area unless other arrangements are in place. Reports will include a distribution list to identify which Indigenous Communities were provided a copy of the report.

The Reference section will include relevant HCA permit number of previous studies. The titles of reports generated under this assessment will clearly identify the HCA permit number.

8.1. Site Records

Site forms and all related documentation (e.g., maps, artifact catalogues) will comply with Branch requirements. Site forms will be submitted within 6 weeks of the completion of site investigations.

Additional comments: Archaeologists will provide the Archaeology Branch with a British Columbia Archaeological Site Inventory Form for all sites revisited or investigated under authority of this permit. To fulfill this condition, the site form, mapping, and related documentation must comply with Archaeology Branch directives for site record submission.

Archaeologists authorized to conduct assessments under this permit who fail to provide satisfactory site forms will be considered to have outstanding obligations, thereby affecting their ability to hold additional permits issued by the Archaeology Branch

For the purpose of this permit, all site forms submitted to the Archaeology Branch will be via email to archsiteform@gov.bc.ca, citing permit **2021-0453** in the subject line.

8.2. Reports

As appropriate, management summaries and recommendations will clearly articulate responsibilities under the *Heritage Conservation Act*.

Delegated archaeologists will submit interim reports to describe their assessments and the results under this permit.

Interim reports shall contain detailed descriptions of every part of each investigation area, in terms of the criteria used to evaluate archaeological potential. This includes all areas subjected to field inspection, as well as those areas reviewed solely through map and document review if the permit would have authorized field inspection of those developments.

Interim reports will provide a tabular description of shovel test areas (STA) in terms of size, stratigraphy, setting, and number of tests placed.

Interim reports will provide a tabular description of each area of archaeological potential (AOP) in terms of size, setting and recommended number of shovel tests.

Spatial data will be submitted to the Branch for STAs and AOPs.

All specialized analyses will be appended to the report.

Low potential areas, including areas assessed by desktop, will be described to support model development.

Unless otherwise discussed with Indigenous Communities or the Branch, all photographs of diagnostic artifacts, formed tools, and rock art will be included in the permit report.

Other details:

All deliverables must be submitted to the Archaeology Branch by email at archpermitapp@gov.bc.ca, citing permit **2021-0453** in the subject.

Proponents may require that non-permitted assessments are summarized and provided to the Archaeology Branch for inclusion in this report.

Archaeologists authorized to conduct assessments under this permit who fail to provide satisfactory interim reports will be considered to have outstanding obligations, thereby affecting their ability to hold additional permits issued by the Archaeology Branch.

Project tracking reports are required under this permit. See Appendix for the format of the report, which must be submitted in excel format.

Deliverables include:

- Project tracking report of field assessment and results
- Notice(s) of Intent
- Site records, including site forms, artifact catalogues, and other documentation
- PDF of finalized interim report(s). Appendices will include:
 - Specialized analyses (e.g., radiocarbon dating)
 - Summary of notices of intent (as applicable).
- Shapefiles (as polygons):
 - study areas
 - shovel test locations
 - areas of potential not subjected to subsurface testing.

8.3. Schedule of deliverables

Is the report due within two years of the anticipated permit issuance?

☐ **Yes** (delete rest of text below and proceed to the next section).

☒ **No** (refer to Table 9409)

As the inability to access information from long-term projects impacts the efficiency and effectiveness of recourse management decisions for the project and archaeological activities in the general area of these studies, the following submissions will be due throughout the course of the permit:

Table 9. Schedule of Deliverables

Deliverable	Timelines (Choose as appropriate)	
	Standard	Other (Specify)
Project Tracking Report	☒ Monthly or Project completion	
Non-permitted PFR reports, including spatial data of survey coverage	☒ Project completion	
Interim reports	☒ For all developments assessed under the permit.	
Shapefiles	☐ Annually, on the anniversary of permit issuance	☒ Annually, on March 31
Summary reports		☒ Annually, on March 31

Site forms will be submitted within six weeks of the completion of site investigations.

A summary report is a status update of all projects by NOI, Interim Report and Site Inventory Records, and a forecast of outstanding work to be completed in the next year if possible, in a tabular format

Additional comments: The interim and summary report should utilize a tabular format.

9. APPLICANT

The applicant is an employee of the Province of British Columbia, Ministry of FLNRORD with the authority to sign on behalf of FLNRORD. This is his first permit.

Additional comments: Delegated Archaeologists will be added to the permit subject to review and authorization by the Archaeology Branch.

10. NOTICES

NOTICE REGARDING COPYRIGHT

At the time of report production, the owner(s) of the report copyright will be asked to grant a non-exclusive license to the Province of British Columbia for the purpose of copying and distributable ing the report. The original copyright owner will retain copyright ownership. The granting of this license will facilitate access to the archaeological data contained within the report and will therefore contribute to the protection of heritage resources throughout the Province. Copyright owners who refuse to grant a license to the Province, and anyone carrying out research on behalf of those copyright owners, will not be granted access to the Archaeology Branch's online library and will not be permitted to photocopy reports within the Branch office.

The following will be added to the first page of reports:

The copyright owner may be the corporate employer of the report author, the client for whom the report was written, the actual author, or the Province of British Columbia if written while employed by the Province. The Grant of License reads:

I _____ confirm that I am the copyright owner (or a copyright owner) of this permit report, and for good and valuable consideration I irrevocably grant a non-exclusive license to the Province of British Columbia, for a term equal to the life of the copyright commencing on the date of execution below, to make copies of the reports, including all appendices and photos, and to provide such copies to anyone, at the discretion of the Province, either at no charge or at the cost incurred by the Province in making and distributing the copies. All parties, except the party for whom the report was prepared, acknowledge that any use or interpretation of this report is at the sole risk and liability of the subsequent user(s).

Executed this ____ day of _____, 20XX, by

Signature of Copyright Owner

Affiliation

2020-0453
Permit Number

NOTICE REGARDING OTHER PERMITS

No permits or approvals, other than a *Heritage Conservation Act* permit, are required to carry out the inspections or investigations described in the permit application. However, licensees and property owners or developers may also require other approvals such as forestry cutting permits and municipal development permits.

11. REFERENCES

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Archaeology Branch

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GENERAL TERMS AND CONDITIONS OF PERMIT

1. Permits shall be valid for the term stipulated on the front of the permit unless otherwise suspended or cancelled. Extensions to the term of the permit, or other amendments, will be considered upon submission of an application to the Archaeology Branch at least 60 days prior to the expiry date of the permit.
2. The permit-holder or delegated archaeologist(s) shall provide the Archaeology Branch with one (1) bound copy and one (1) electronic copy in PDF format of a written report, in accordance with the standards required by the Minister, outlining the work carried out under the terms of the permit.
3. The delegated archaeologist(s) shall provide the Archaeology Branch with Project Tracking reports at the completion of each project.
4. The title page of all reports must indicate the name(s) of the copyright owner(s) and, where agreed to, a Grant of License statement completed and signed by the copyright owner(s).
5. A person appointed by the Archaeology Branch may at any time inspect any aspect of a project conducted under the terms of this permit. To further their inspection, the appointee may request field data, or conduct excavations within the study area. Unless other arrangements are made, data must be made available to the Archaeology Branch within five (5) days of their request. Notwithstanding the expiration or earlier termination of the term of the permit this provision will remain and continue in full force and effect.
6. Upon completion of any inspection or investigation involving excavations, the permit holder or delegated archaeologist(s) shall make reasonable efforts to ensure all sites are restored as nearly as possible to their former condition.
7. The permit holder or delegated archaeologist(s) shall arrange for a secure repository to curate any materials recovered under authority of the permit.
8. Heritage objects and associated materials recovered under authority of the permit may not be sold or exchanged for financial gain. Any other transfer of heritage objects, materials and records, or changes to the conditions identified under the "Disposition of materials collected..." section of the permit may only be carried out with prior consent of the Minister.
9. The permit holder or delegated archaeologist(s) shall conform to all requirements that may be imposed by the institution or organization named in the "Disposition of materials collected..." section of the permit.
10. Notwithstanding expiration or earlier termination of the term of the permit, provisions with respect to the "Disposition of materials collected ..." section shall remain and continue in full force and effect.
11. The permit holder or delegated archaeologist(s) shall utilize any site recording forms, formats or systems required by the minister. To fulfill this condition, the site form, mapping, and related documentation must comply with Archaeology Branch directives for site record submission. Failure to submit satisfactory site records will be considered an outstanding obligation, thereby affecting the archaeologists' ability to hold additional permits.
12. A Heritage Investigation permit issued under the HCA does not authorize entry onto land or into a building without the permission of the owner or occupier.
13. The permit holder or delegated archaeologist(s) shall submit spatial information (as a shapefile in accordance with the standards required by the Minister) of all study areas that were the subject of in-field inspections.
14. Where known, First Nation file numbers will be referenced in permit-related correspondence.
15. Unless other arrangements are made, First Nations will be provided electronic copies of reports for work conducted in their area of interest under the permit.

16. In the event ancestral remains are encountered, all work must cease in the vicinity of the remains and the Archaeology Branch must be contacted for direction, unless otherwise provided for in the permit application
17. Archaeologists qualified as a Permit Holders in the appropriate cultural area will be retained by the applicant, and act as a co-permittee, known as the delegated archaeologists.
18. The delegated archaeologist is responsible for all of the terms and conditions of the permit (e.g., site records, management recommendations, and interim reporting) for fieldwork conducted under the permit. The delegated archaeologist must be an eligible permit holder, having no outstanding obligations with the Archaeology Branch and sufficiently experienced to hold permits without conditions (i.e., not a novice permit holder).
19. The delegated archaeologist may utilize Field Directors per Bulletin 17.
20. All impact management recommendations must be reviewed and signed by the Delegated Archaeologist or similarly qualified Eligible Permit Holder, though emergent situations may be approved by Archaeology Branch staff.
21. Any ground-altering activities within known archaeological sites must be conducted under the direction of the archaeologist.
22. The permit holder shall conduct the inspection as described in the permit application, unless otherwise specified in the permit.
23. Any other conditions that may be specified in the permit.

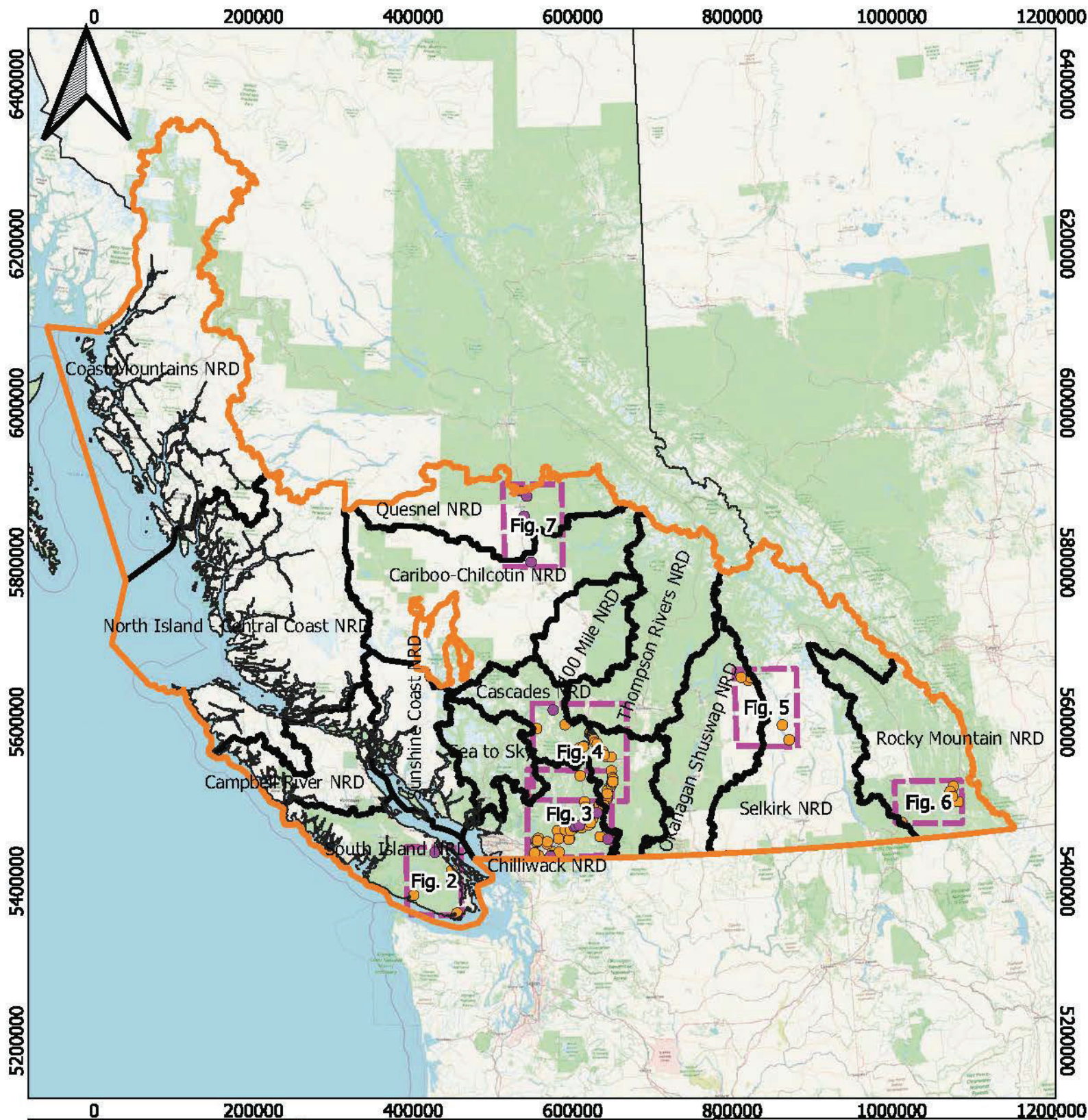


Fig. 1 - Permit Area Overview

0 100 200 km

HCA Application: 21A0694

Scale: 1: 6,500,000

Datum: UTM 10 N

Date: 2021-12-03

Author:

Corey Cookson (Arch Branch)

Legend

● Flood Events (Recorded as of 2021-11-26)

● Landslides (Recorded as of 2021-11-2021)

NRDs

Permit Area

Midrange maps

Base Data: Open Street Map
Flood Data: Ministry of Transportation and Infrastructure
Landslides: GeoBc



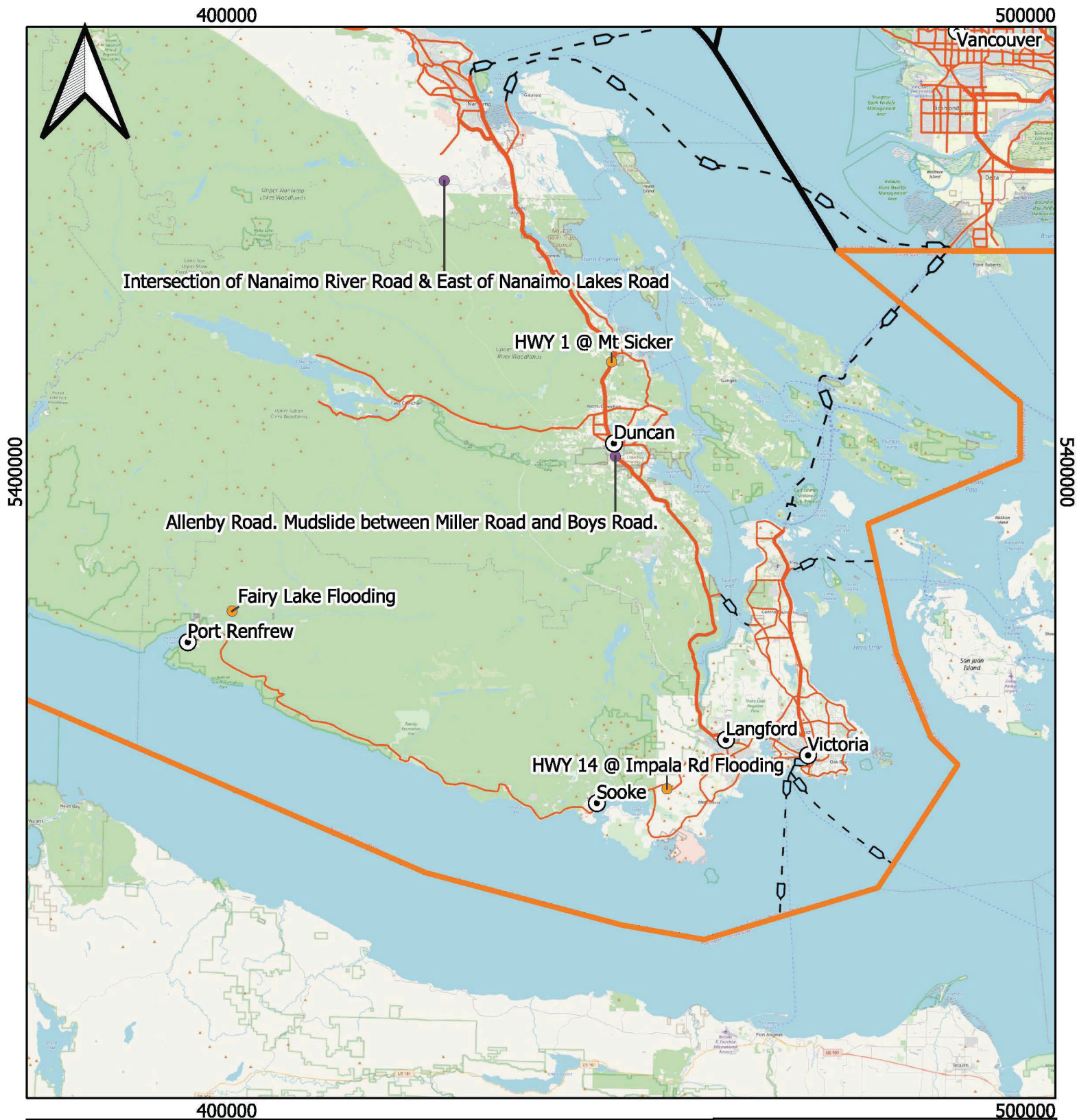


Fig. 2 Midrange - South Island

0 10 20 km

HCA Application: 21A0694

Scale: 1: 650,000

Datum: UTM 10 N

Date: 2021-11-26

Author:

Corey Cookson (Arch Branch)

Legend

Permit Area

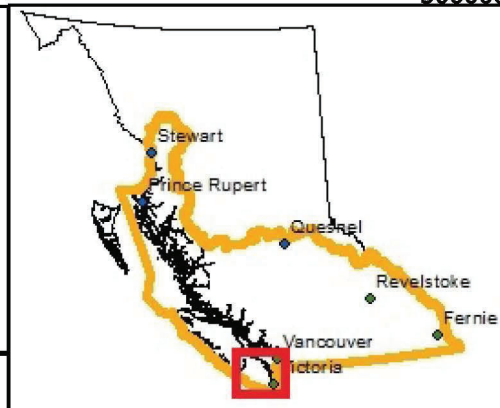
Cities

Highway

● Landslides (Recorded as of 2021-11-26)

● Flood Events (Recorded as of 2021-11-26)

Base Data: Open Street Map
Flood Events: Ministry of Transportation and Infrastructure
Landslides: GeoBC



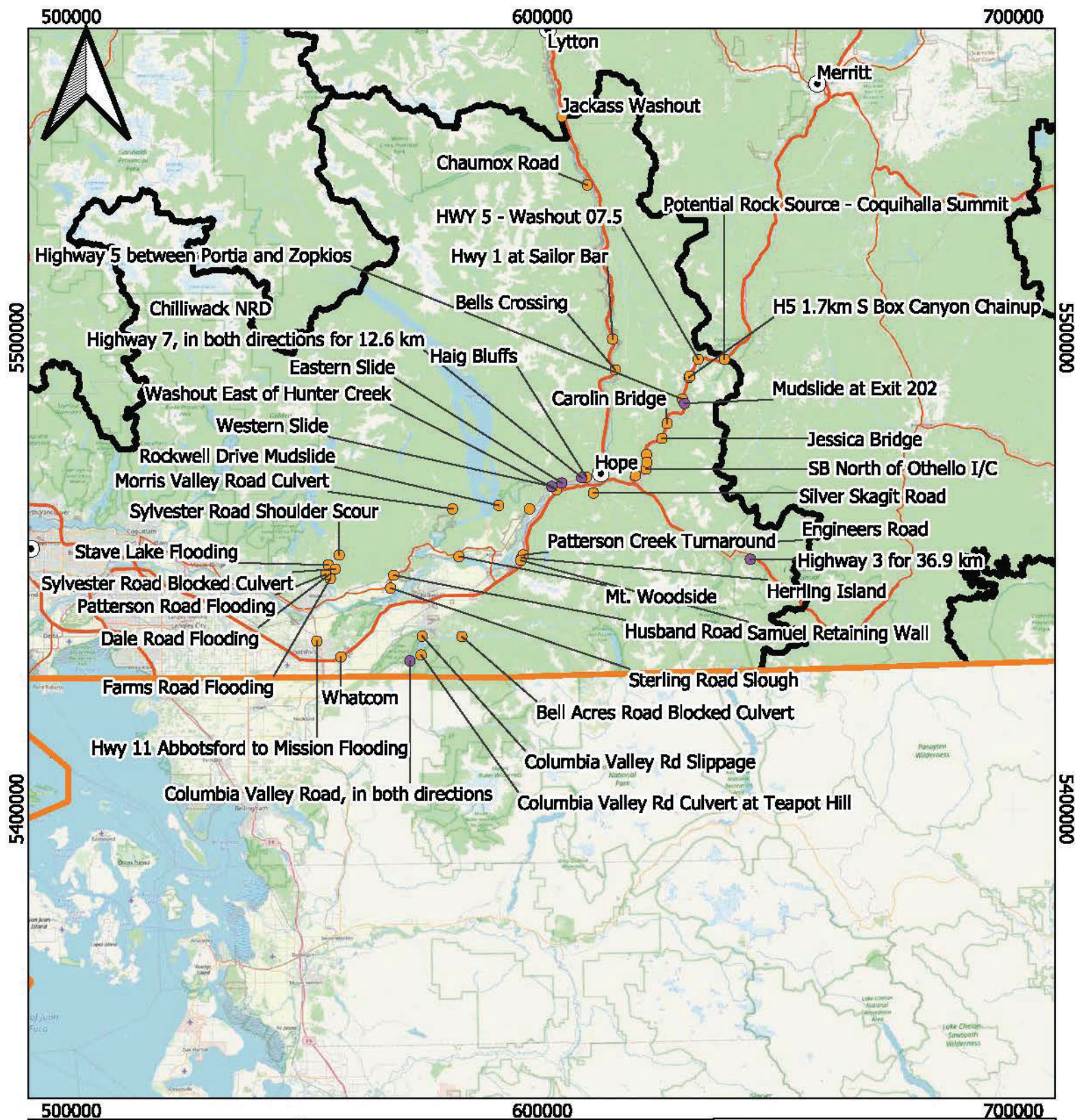


Fig. 3 Midrange - Chilliwack

0 10 20 km

HCA Application: 21A0694

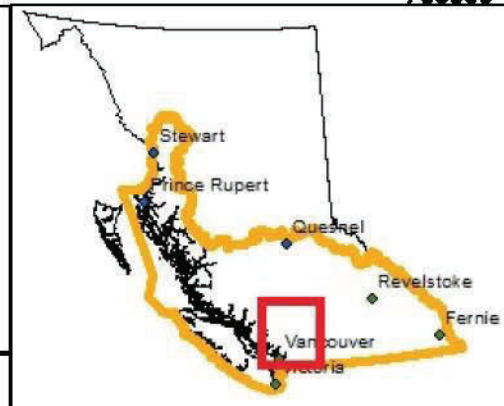
Scale: 1: 1,100,000

Datum: UTM 10 N

Date: 2021-11-26

Author:

Corey Cookson (Arch Branch)



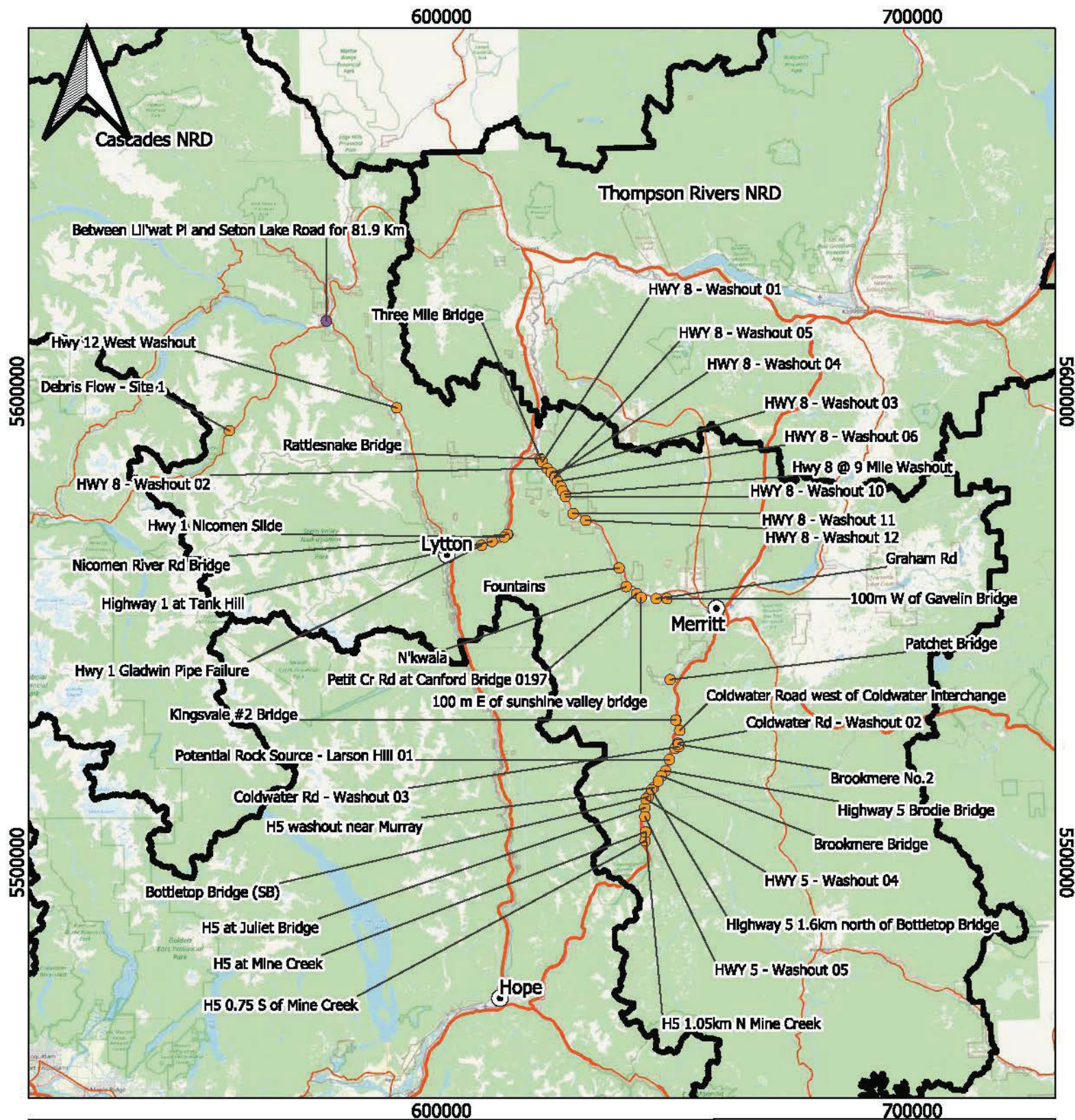


Fig. 4 Midrange - Cascades

0 10 20 km

HCA Application: 21A0694

Scale: 1:1,100,000

Datum: UTM 10 N

Date: 2021-11-26

Author:

Corey Cookson (Arch Branch)

Legend

Permit Area

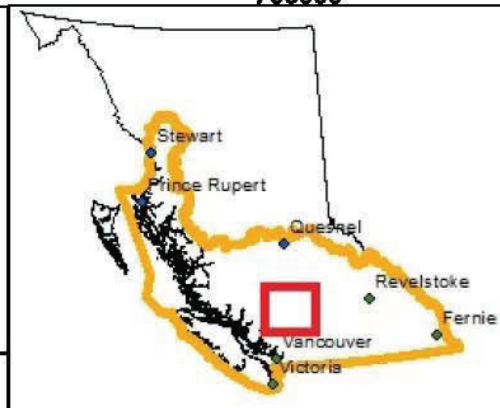
Cities

Highway

Landslides (Recorded as of 2021-11-26)

Flood Events (Recorded as of 2021-11-26)

Base Data: Open Street Map
Flood Events: Ministry of Transportation and Infrastructure
Landslides: GeoBC



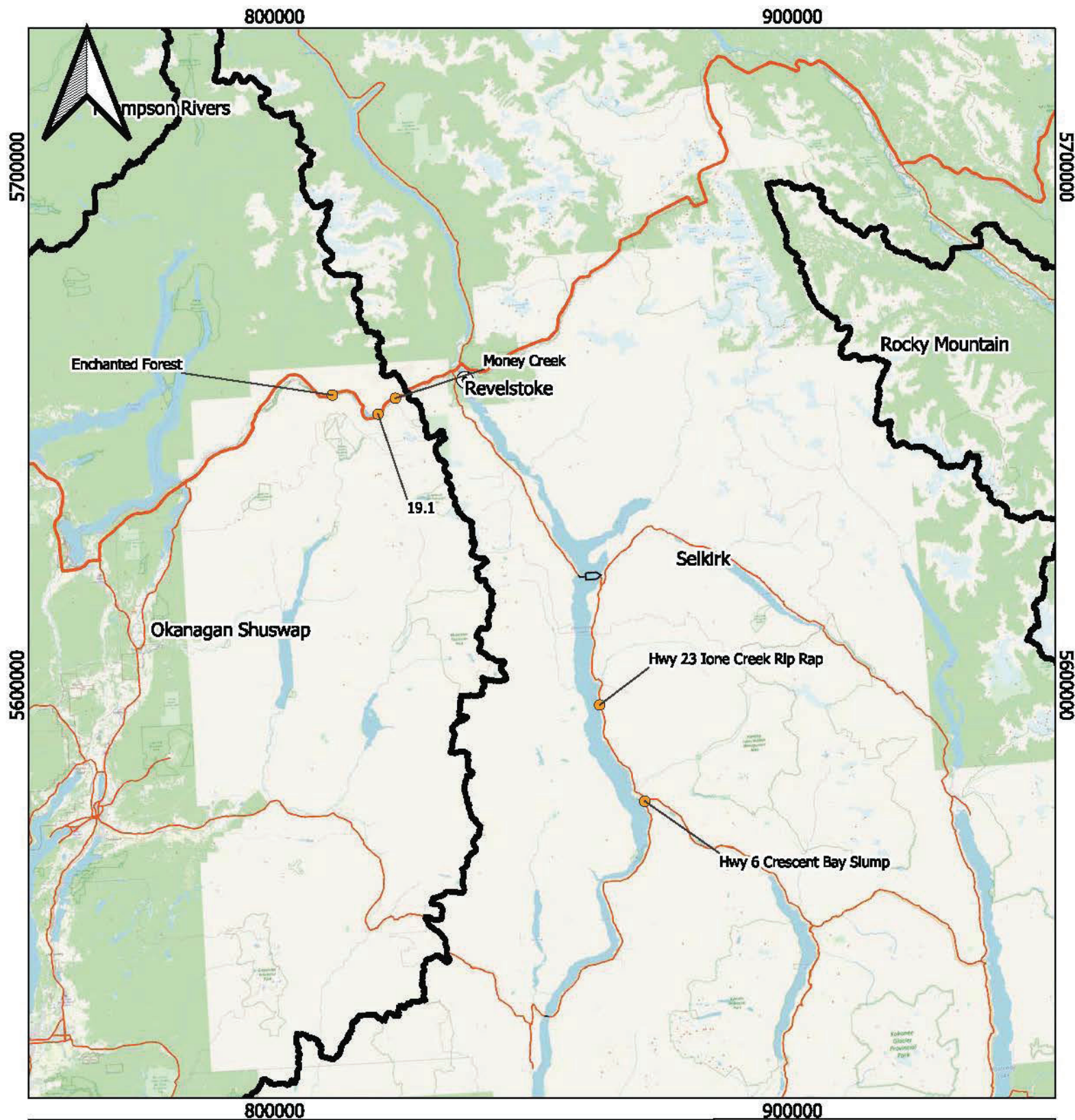


Fig. 5 Midrange - Okanagan Shuswap & Selkirk

0 10 20 km

HCA Application: 21A0694

Scale: 1: 1,000,000

Datum: UTM 10 N

Date: 2021-11-24

Author:

Corey Cookson (Arch Branch)

Legend

Permit Area

Cities

Highway

● Flood Events (As of Nov 23, 2021)

Natural Resource Districts

Base Data: Open Street Map
Flood Events: Ministry of Transportation and Infrastructure



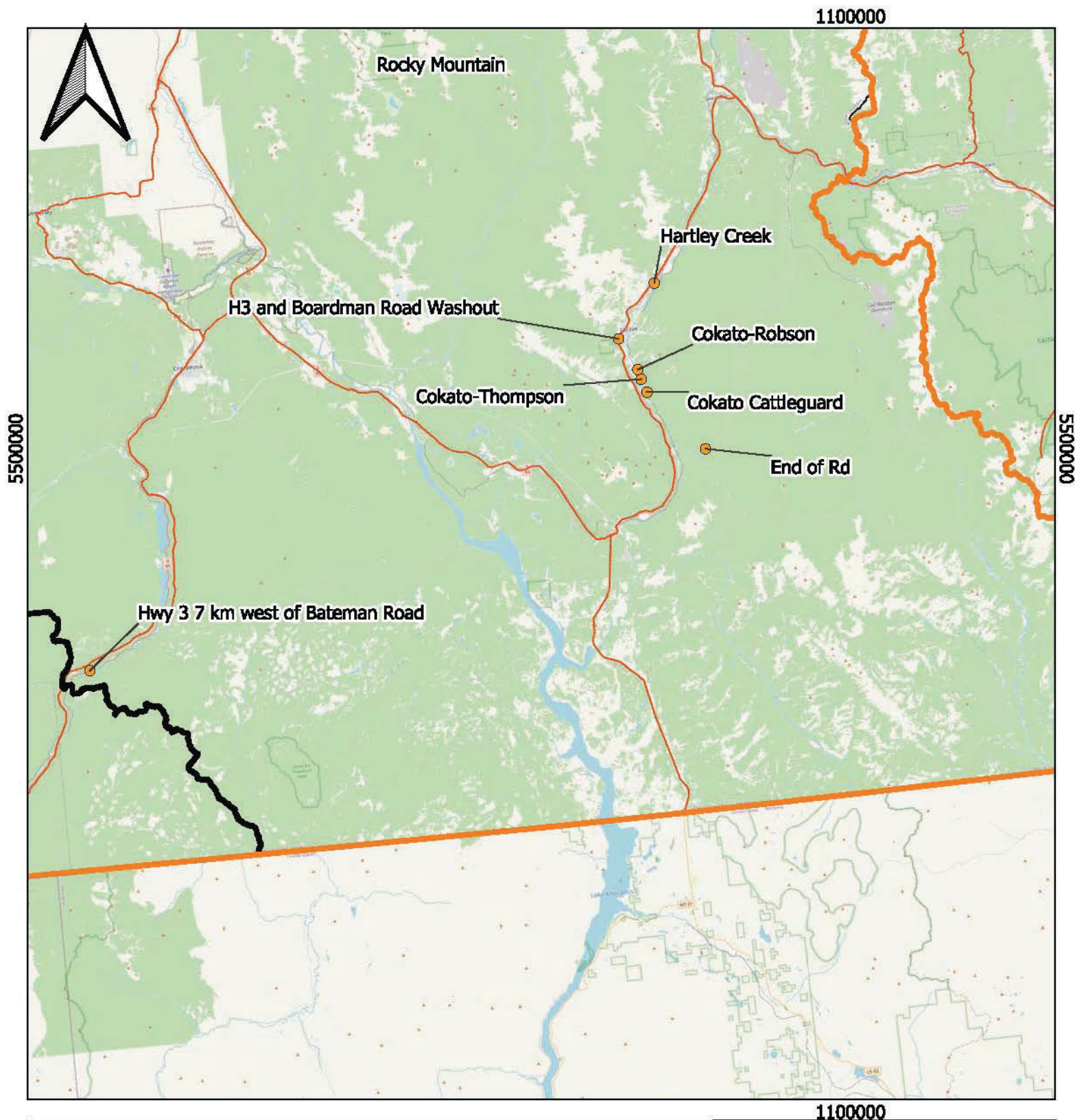


Fig. 6 Midrange - Rocky Mountain

0 10 20 km

HCA Application: 21A0694

Scale: 1: 600,000

Datum: UTM 10 N

Date: 2021-11-24

Author:

Corey Cookson (Arch Branch)

Legend

- Permit Area
- Flood Events (As of Nov 24, 2021)
- Cities
- NRDs
- Highway

Base Data: Open Street Map

Flood Events: Ministry of Transportation and Infrastructure



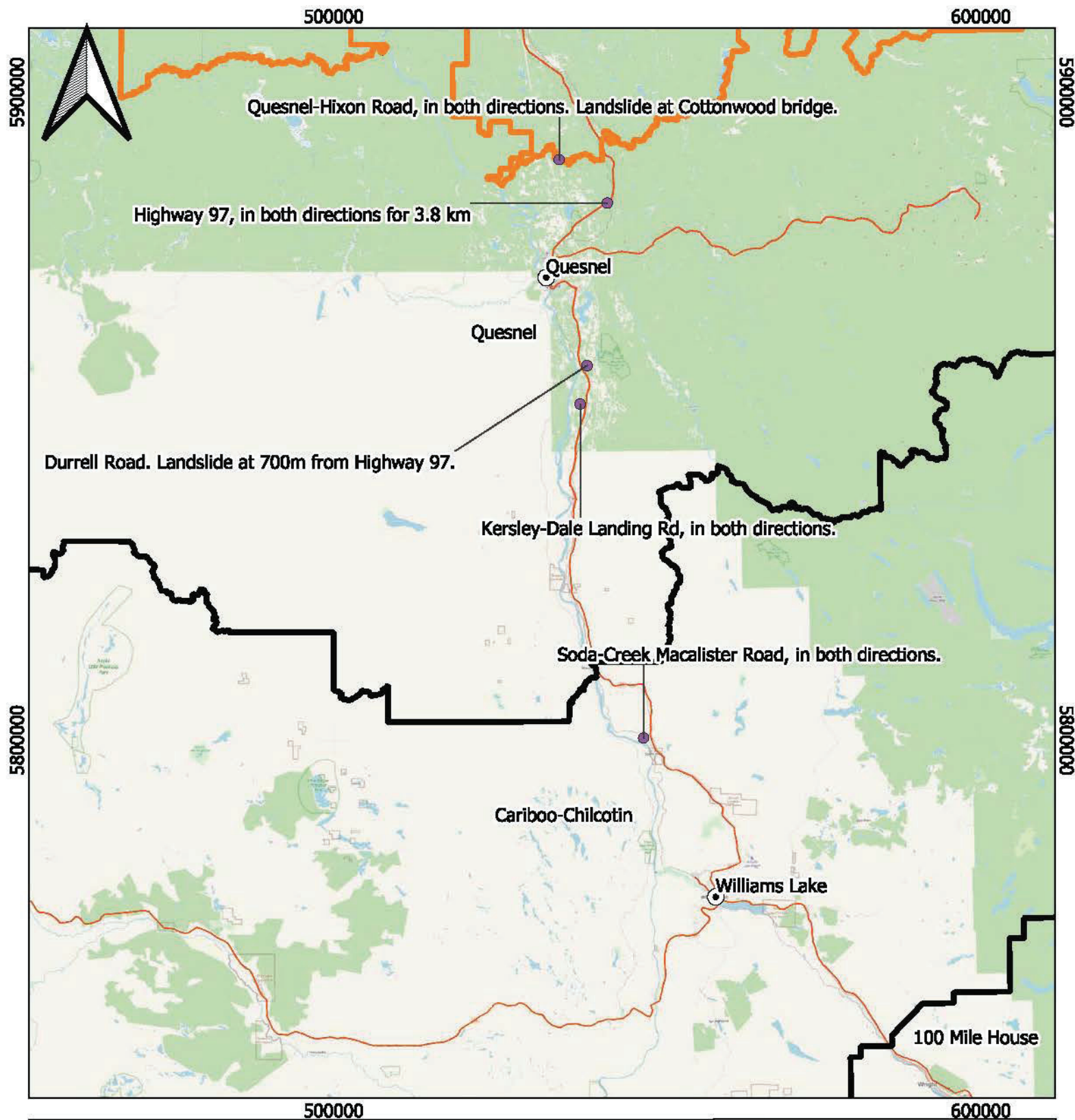


Fig. 7 Midrange - Quesnel & Cariboo-Chilcotin

0 10 20 km



HCA Application: 21A0694

Scale: 1: 800,000

Datum: UTM 10 N

Date: 2021-11-26

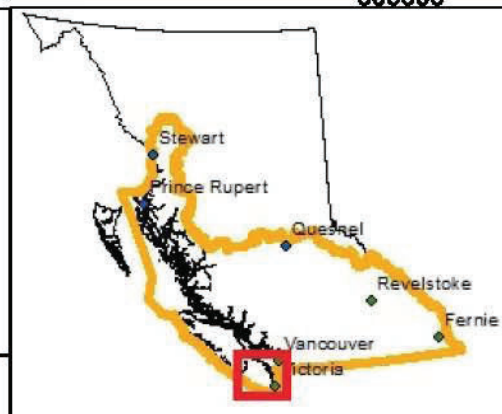
Author:

Corey Cookson (Arch Branch)

Legend

- Permit Area
- Cities
- Highway
- Landslides (Recorded as of 2021-11-26)
- Flood Events (Recorded as of 2021-11-26)

Base Data: Open Street Map
Flood Events: Ministry of Transportation and Infrastructure
Landslides: GeoBC



Appendix 1: Landslides and Floods impacting MoTI infrastructure

Data in the following tables is current to November 26, 2021

Table 10 MoTI Infrastructure impacted by Landslides and Flood Events

Area	Region	District	Event	Location
North	Skeena	Coast Mountains	N/A	
Coast	West Coast	North Island – Central Coast	N/A	
		Campbell River	N/A	
		South Island	Flood	Fairy Lake Flooding
			Flood	Hwy 1 @ Mt Sicker
			Landslide	Allenby Road. Mudslide between Miller Road and Boys Road.
			Landslide	Intersection of Nanaimo River Road & East of Nanaimo Lakes Road
			Flood	Hwy 14 @ Impala Rd Flooding
	South Coast	Sunshine Coast	N/A	
		Sea to Sky	N/A	
		Chilliwack	Flood	Bell Acres Road Blocked Culvert
			Flood	Bells Crossing
			Flood	Carolin Bridge
			Flood	Chaumox Road
			Flood	Columbia Valley Rd Culvert at Teapot Hill
			Flood	Columbia Valley Rd Slippage
			Landslide	Columbia Valley Road, in both directions
			Flood	Dale Road Flooding
			Landslide	Eastern Slide
			Flood	Engineers Road
			Flood	Farms Road Flooding
			Flood	Hwy 5 1.3km S Box Canyon Chainup
			Flood	Hwy 5 1.7km S Box Canyon Chainup
			Flood	Haig Bluffs
			Flood	Herrling Island
			Landslide	Highway 3, in both directions for 36.9 km
			Flood	Highway 5 between Portia and Zopkios
			Flood	Highway 5 - Washout 07.5
			Flood	Highway 5 - Washout 11
			Flood	Highway 5 - Debris 04
			Flood	Highway 5 - Debris 05
			Landslide	Highway 7, in both directions for 12.6 km
			Flood	Husband Road
			Flood	Hwy 1 at Sailor Bar
			Flood	Hwy 11 Abbotsford to Mission Flooding
			Flood	Jessica Bridge
			Flood	Morris Valley Road Culvert
			Flood	Mt. Woodside
			Landslide	Mudslide at Exit 202
			Flood	Patterson Creek Turnaround
			Flood	Patterson Road Flooding
			Flood	Potential Rock Source - Coquihalla Summit

Area	Region	District	Event	Location
Coast	South Coast	Chilliwack	Flood	Rockwell Drive Mudslide
			Flood	Samuel Retaining Wall
			Flood	SB North of Othello I/C
			Flood	Seabird Bluffs
			Flood	Silver Skagit Road
			Flood	Stave Lake Flooding
			Flood	Sterling Road Slough
			Flood	Sylvester Road Blocked Culvert
			Flood	Sylvester Road Shoulder Scour
			Flood	Washout East of Hunter Creek
			Landslide	Western Slide
			Flood	Whatcom
South	Thompson-Okanagan	Cascades	Flood	100 m E of sunshine valley bridge
			Flood	100 m W Gavelin Bridge
			Flood	Bottletop Bridge (SB)
			Flood	Brookmere Bridge
			Flood	Brookmere No.2
			Flood	Coldwater Road west of Coldwater interchange
			Flood	Coldwater Rd - Washout 02
			Flood	Coldwater Rd - Washout 03
			Flood	Debris Flow - Site 1
			Landslide	Eastern extent of mudslide between Lil'wat PI and Seton Lake Road for 81.9 Km
			Flood	Fountains
			Flood	Graham Rd
			Flood	Hwy 1 at Nicomen Bridge
			Flood	Hwy 5 0.75 S of Mine Creek
			Flood	Hwy 5 1.05km N Mine Creek
			Flood	Hwy 5 at Juliet Bridge
			Flood	Hwy 5 at Mine Creek
			Flood	Hwy 5 washout near Murray
			Flood	HWY 5 - Washout 04
			Flood	HWY 5 - Washout 05
			Flood	HWY 8 - Washout 01
			Flood	HWY 8 - Washout 02
			Flood	HWY 8 - Washout 03
			Flood	HWY 8 - Washout 04
			Flood	HWY 8 - Washout 05
			Flood	HWY 8 - Washout 06
			Flood	HWY 8 - Washout 07
			Flood	HWY 8 - Washout 08
			Flood	HWY 8 - Washout 10
			Flood	HWY 8 - Washout 11
			Flood	HWY 8 - Washout 12
			Flood	Highway 1 at Tank Hill
			Flood	Highway 12 washout 2 Mud Slide
			Flood	Highway 5 1.6km north of Bottletop Bridge
			Flood	Highway 5 Brodie Bridge
			Flood	Hwy 1 Gladwin Pipe Failure
			Flood	Hwy 1 Nicomen Slide

Area	Region	District	Event	Location
South	Thompson-Okanagan	Cascades	Flood	Hwy 12 West Washout
			Flood	Hwy 8 @ 9 Mile Washout
			Flood	Jackass Washout
			Flood	Kingsvale #2 Bridge
			Flood	Murray Bridge
			Flood	N'kwala
			Flood	Nicomen River Rd Bridge
			Flood	Patchet Bridge
			Flood	Petit Cr Rd at Canford Bridge 0197
			Flood	Potential Rock Source - Larson Hill 01
			Flood	Potential Rock Source - Larson Hill 02
			Flood	Rattlesnake Bridge
			Flood	Three Mile Bridge
		Okanagan-Shuswap	Flood	19.1
			Flood	Enchanted Forest
			Flood	Money Creek
		Thompson Rivers	N/A	
	Kootenay-Boundary	Selkirk	Flood	Hwy 23 Lone Creek Rip Rap
			Flood	Hwy 6 Crescent Bay Slump
		Rocky Mountain	Flood	Cokato Cattleguard
			Flood	Cokato-Robson
			Flood	Cokato-Thompson
			Flood	End of Rd
			Flood	Hwy 3 and Boardman Road Washout
			Flood	Hartley Creek
			Flood	Hwy 3 7 km west of Bateman Road
	Cariboo	100 Mile House	N/A	
		Cariboo-Chilcotin		
			Landslide	Soda-Creek Macalister Road, in both directions.
		Quesnel	Landslide	Kersley-Dale Landing Rd, in both directions.
			Landslide	Durrell Road. Landslide at 700m from Highway 97.
			Landslide	Quesnel-Hixon Road, in both directions.
			Landslide	Landslide at Cottonwood bridge.
			Landslide	Highway 97, in both directions for 3.8 km

Appendix 2: Archaeological Sites and MoTI infrastructure

Data in the following tables is current to November 26, 2021

Table 11. Summary of recorded archaeological sites within 1 km of impacted MoTI infrastructure by Natural Resource District

Area	Region	District	Table
North	Skeena	Coast Mountains	N/A
Coast	West Coast	North Island-Central Coast	N/A
		Campbell River	N/A
		South Island	Table
	South Coast	Sunshine Coast	N/A
		Sea to Sky	N/A
		Chilliwack	Table
South	Thompson-Okanagan	Cascades	Table
		Okanagan-Shuswap	N/A
		Thompson Rivers	N/A
	Kootenay-Boundary	Selkirk	Table
		Rocky Mountain	Table
	Cariboo	100 Mile House	N/A
		Cariboo-Chilcotin	N/A
		Quesnel	N/A

Table 12. Recorded sites within 1 km - South Island Natural Resource District

Impact	Location	Site	Site Type	Distance/Direction
Flood	Highway 1 @ Mt Sticker	DfRw-7	Subsurface, Shell midden; Surface lithics	460 m N
Flood	Highway 14 Impala Road	DcRv-45	Cultural Material, Surface	200 m S
Flood		DcRv-83	Cultural Material, Surface, Lithics	460 m E/SE

Table 13. Recorded sites within 1 km - Chilliwack Natural Resource District

Impact	Location	Site	Site Type	Distance/Direction
Flood	Bells Crossing	DjRi-12	Rock art, pictograph; Habitation, Rock Shelter; Subsurface and Surface Lithics	380 m SE
Flood		DjRi-16	Habitation, Rock Shelter	110 m SE
Flood		DjRi-2	Human Remains; Subsurface Lithics; Cultural Depression, Housepit	150 m N
Flood		DjRi-3	Human Remains; Subsurface Lithics	560 m N
Flood		DjRi-32	Cultural Material, Surface	600 m S
Flood		DjRi-53	Cultural Depression, Cache Pit; Cultural Material, Surface	380 m SE
Flood		DjRi-57	Cultural Material, Surface, Fire broken Rock; Habitation, Rock Shelter	380 m E
Flood		DjRi-63	Subsurface Lithics; Habitation, Rock Shelter	620 m SE
Flood		DjRi-65	Subsurface Lithics; Habitation, Rock Shelter	380 m SE
Flood		DjRi-79	Post Contact Human Remains	250 m NE
Flood		DjRi-87	Cultural Material, Surface, Lithics	500 m S/SE
Flood	Carolyn Bridge	DiRh-9	Subsurface Lithics	200 m SE
Flood		DiRh-6	Subsurface Lithics	700 m NE
Flood		DiRh-3	Culturally Modified Tree	950 m NW
Flood	Highway 1 @ Sailor Bar	DjRi-25	Surface Lithics	440 m NE
Flood		DjRi-28	Surface Lithics	330 m NE
Flood		DjRi-66	Cultural Depressions, Cache Pit and Unassigned	580 m N/NE
Flood		DjRi-81	Cultural Depression, Cache Pit; Cultural Material, Surface	380 m NE
Flood		DjRi-83	Surface Lithics	700 m N/NE
Flood		DjRi-84	Surface Lithics	400 m N/NE
Flood	Jessica Bridge	DiRh-4	Cultural Depression, Undefined	980 m SW
Flood	Morris Valley Road Culvert	DhRI-53	Culturally Modified Tree	530 m N

Impact	Location	Site	Site Type	Distance/Direction
Flood	Washout East of Hunter Creek	DiRj-18	Surface Lithics	290 m N
Flood		DiRj-28	Cultural Depression, Cache Pit	480 m NE
Flood		DiRj-34	Subsurface Lithics and Faunal; Habitation, Rock Shelter	520 m E/NE
Flood		DiRj-5	Surface Lithics	260 m NE
Flood	Chaumoux Road	DIRi-11	Cultural Depression, Cache Pit	625 m NE
Flood		DIRi-14	Cultural Depression, undefined; Historic Building	625 m NE
Flood		DIRi-15	Cultural Depression, Cache Pit	625 m NE
Flood		DIRi-32	Historic Building	Direct overlap
Flood		DIRi-33	Cultural Depression, Cache Pit	600 m N
Flood	Haig Bluffs	DiRi-18	Post Contact Human Remains	730 m E
Flood		DiRi-38	Culturally Modified Tree	360 m SE
Flood	Highway 11 Abbotsford	DgRn-30	Surface Lithics	930 m E/SE
Flood	Silver Skagit Road	DiRi-105	Culturally Modified Tree	780 m SE
Flood		DiRi-123	Subsurface Lithics; Habitation, Rock Shelter	630 m N
Flood		DiRi-99	Subsurface Lithics; Habitation, Rock Shelter	930 m E
Landslide	Eastern Slide	DiRj-21	Lithics, cairn	Direct overlap
Landslide	Western Slide	DiRj-32	Rock Shelter	Direct overlap
Landslide	Highway 7, in both directions	DiRj-1	Cultural Depression, Housepit; Rock art, Petroglyph	Direct overlap
Flood	Sterling Road Slough	DhRm-2	Cultural Depression, undefined; Surface Lithics	760 m NW

Table 14. Recorded sites within 1 km - Cascades Natural Resource District

Impact	Location	Site	Site Type	Distance/Direction
Flood	100 m E of Sunshine Valley Bridge	EaRf-17	Surface Lithics	890 m E
Flood		EaRf-18	Surface Lithics	730 m NE
Flood		EaRf-7	Human Remains	650 m E
Landslide	Eastern extent of mudslide between Lil'wat PI and Seton Lake Road for 81.9 Km	EeRI-120	Cultural Depression, Housepit; Surface, lithics	Direct overlap
Landslide		EeRI-217	Subsurface and Surface Lithics	Direct overlap
Flood	Fountains	EbRg-1	Cultural Depression, Housepit	290 m N/NW
Flood		EbRg-32	Cultural Depression, Housepit	350 m SW
Flood	Highway 1 @ Tank Hill	EbRi-37	Cultural Depression, Cache pit; Surface Lithics	900 m NE
Flood		EbRi-38	Cultural Depression, Cache pit; Surface Lithics	220 m N
Flood	Highway 1 Gladwin Pipe Failure	EbRi-44	Cultural Depression, undefined; Surface Lithics	700 m N
Flood	Highway 1 Nicomen Slide	EbRi-3	Cultural Depression, undefined; Surface Lithics	360 m NW
Flood		EbRi-49	Rock art, petroglyph	680 m NE
Flood	Highway 8 @ 9 mile washout	EcRh-1	Cultural Depression, Housepit and Cache pits; Human Remains	240 m NW
Flood		EcRh-26	Surface Lithics	260 m S
Flood		EcRh-3	Cultural Depression, Cache Pit; Habitation, Rock Shelter; Surface Lithics; Human Remains	645 m NW
Flood	Highway 8 Washout 01	EcRh-98	Surface Lithics	100 m NW
Flood		EcRh-92	Surface Lithics; Subsurface Lithics	300 m NW
Flood	Highway 8 Washout 03	EcRh-87	Surface Lithics	150 m W
Flood	Highway 8 Washout 04	EcRh-9	Rock art, pictograph	590 m SE
Flood	Highway 8 Washout 05	EcRh-9	Rock art, pictograph	270 m E/SE

Impact	Location	Site	Site Type	Distance/Direction
Flood	Highway 8 Washout 07	EcRh-2	Surface Lithics; Rock art, pictograph; Cultural Depression, Cache Pit	700 m SE
Flood	Highway 8 Washout 08	EcRh-1	Cultural Depression, Housepit and Cache pits; Human Remains	50 m S
Flood		EcRh-2&5	Surface Lithics; Rock art, pictograph; Cultural Depression, Cache Pit	110 m NW
Flood		EcRh-3	Cultural Depression, Cache Pit; Habitation, Rock Shelter; Surface Lithics; Human Remains	250 m E
Flood	Highway 8 Washout 09	EcRh-9	Rock art, pictograph	700 m N/NW
Flood	Highway 8 Washout 10	EcRh-26	Surface Lithics	220 m N
Flood		EcRh-1	Cultural Depression, Housepit and Cache pits; Human Remains	720 m N/NW
Flood	Highway 8 Washout 11	EbRh-24	Surface Lithics; Subsurface Lithics	180 m W (on Federal Reserve)
Flood		EbRh-4	Cultural Depression, Cache Pit and House pit; Subsurface, Faunal; Subsurface, Lithics	300 m SW
Flood		EbRh-23	Surface Lithics; Subsurface Lithics	420 m SE
Flood	Highway 8 Washout 12	EbRg-7	Cultural Depression, Cache Pit	160 m E/SE
Flood		EbRg-6	Cultural Depression, Cache pits; Human Remains	320 m SE
Flood		EbRg-26	Surface Lithics	360 m W
Flood		EbRg-8	Culturally Modified Tree	530 m W
Flood		EbRg-27&31	Surface Lithics; Subsurface Lithics	750 m SE
Flood		EbRg-25&27	Surface Lithics; Subsurface Lithics	650 m SW
Flood		EbRh-1	Cultural Depression, House Pit	620 m NW
Flood	Jackass	EaRj-49	Cultural Depression, Cache Pit	840 m NW
Flood		EaRj-63	Historic Log Cabin	890 m W/NW
Flood		EaRj-57	Historic Building; Surface Lithics	750 m S
Flood	Nicomen River Rd	EbRi-49	Rock art, petroglyph	240 m SW

Impact	Location	Site	Site Type	Distance/Direction
Flood		EbRi-7	Human Remains	100 m N
Flood	N'Kwala	EaRg-3	Cultural Material, Surface; Human Remains	1 km SE
Flood	Patchet Bridge	DIRf-1	Subsurface Lithics	950 m N
Flood	Petit Cr Road Canford Bridge	EaRg-4	Rock art, pictograph	925 m W/SW
Flood	Rattlesnake Bridge	EcRh-94	Subsurface Lithics	300 m W/NW
Flood		EcRh-92	Surface Lithics; Subsurface Lithics	670 m SE
Flood	Three Mile Bridge	EcRh-92	Surface Lithics; Subsurface Lithics	350 m S
Flood		EcRh-98	Surface Lithics	500 m S
Flood		EcRh-94	Subsurface Lithics	600 m NW

Table 15. Recorded sites within 1 km - Selkirk Natural Resource District

Impact	Location	Site	Site Type	Distance/Direction
Flood	Highway 6 Crescent Bay Slump	EbQk-1	Human Remains; Cultural Material, surface	650 m N
Flood		EbQk-2	Cultural Depression, sweat lodge	960 m S

Table 16. Recorded sites within 1 km - Rocky Mountain Natural Resource District

Impact	Location	Site	Site Type	Distance/Direction
Flood	Highway 3, 7 km west of Bateman Road	DhPx-1	Historic Transportation Trail; Subsurface Lithics	675 m NW
Flood		DhPx-3	Historic Transportation Trail; Subsurface Lithics	545 m SW

Appendix 3: Project Tracking

A project tracking log (in Excel) must be maintained and provided to the Archaeology Branch on a monthly basis during active project work. Forms should be submitted by email to ArchPermitApp@gov.bc.ca citing permit **2021-0453** in the subject line.

The log must minimally contain the following columns:

1. Firm Name
2. Delegated Archaeologist Name
3. Interim Report Number
4. Interim Report Name
5. Proponent
6. Proponent Contact person
7. Component Names
8. Notice of Intent Date
9. Date(s) of fieldwork
10. Number of assessment hours (field days x crew members)
11. Automatically Protected Sites found (yes/no)
12. Other cultural sites found (yes/no)
13. Temp site Number
14. Borden Number
15. Revisit (yes/no)

For each site:

16. Site Type
17. Significance Rating
18. Ongoing impacts?
19. Mitigation type(s): avoidance, protection, systematic data recovery
20. Archaeology Branch Approved Mitigation: Date
21. Mitigation approval by: Archaeology Branch Project Officer name



Additional Client Certification for Permits Issued under Section 12.2 of the Heritage Conservation Act

Select as appropriate:

☒ An application for a Heritage Investigation Permit **21A0694** has been submitted to the Branch by: **Sarah Fraser, A/Associate Deputy Minister, Ministry of Forests, Land, Natural Resource Operations and Rural Development (FLNRORD)**. It is currently described as: *Archaeological investigation of recovery activities undertaken in response to 2021's catastrophic rain resulting in widespread flooding and landslide events in British Columbia by the Ministry of Forests, Lands, Natural Resource Operations and Rural Development (FLNRORD), the Ministry of Transportation and Infrastructure (MOTI) and other Provincial and/or Local Government proponents responsible to restore infrastructure in the affected areas*

Financial responsibility for assessments is assumed by the following proponent:

Name: Jeff Sheldrake, Assistant Deputy Minister, Coast Area	Company: Ministry of Forests, Lands, Natural Resource Operations and Rural Development (FLNRORD)
Address: 4th Floor - 2975 Jutland Road, Victoria, BC V8T 5J9	
Phone: (778) 974-5826	Fax or Email: Jeff.Sheldrake@gov.bc.ca

CLIENT'S CERTIFICATION

I certify that I have read and concur with the content of this permit application, any amendments submitted to the Branch, and any other conditions the Minister may impose, as empowered by said Act.

Client Certification

Date: December 8, 2021	Client Name: Jeff Sheldrake, Assistant Deputy Minister, Coast Area	Client Affiliation: Ministry of Forests, Lands, Natural Resource Operations and Rural Development (FLNRORD)	Client Signature: 
---	---	--	---

CERTIFICATION AND CONSENT

CLIENT'S CERTIFICATION

I certify that I have read and concur with the content of this permit application.

Client Certification.

Client Endorsement

For applications where there are no recorded archaeological sites, or where assessment is not required by another agency or under a Heritage Conservation Act Ministerial Order:

I acknowledge I have not been ordered to conduct a heritage inspection under S.12.3 of the Heritage Conservation Act and that I have commissioned an archaeological impact assessment on my own accord to facilitate my proposal to undertake the developments described herein.

Name: Jeff Sheldrake, Assistant Deputy Minister, Coast Area	Company: Ministry of Forests, Lands, Natural Resource Operations and Rural Development (FLNRORD)
Address: 4th Floor - 2975 Jutland Road, Victoria, BC V8T 5J9	
Phone: (778) 974-5826	Fax or Email: Jeff.Sheldrake@gov.bc.ca
Date: December 7, 2021	Client Signature: 



Additional Client Certification for Permits Issued under Section 12.2 of the Heritage Conservation Act

Select as appropriate:

☒ An application for a Heritage Investigation Permit **21A0694** has been submitted to the Branch by: **Sarah Fraser, A/Associate Deputy Minister, Ministry of Forests, Land, Natural Resource Operations and Rural Development (FLNRORD)**. It is currently described as:
Archaeological investigation of recovery activities undertaken in response to 2021's catastrophic rain resulting in widespread flooding and landslide events in British Columbia by the Ministry of Forests, Lands, Natural Resource Operations and Rural Development (FLNRORD), the Ministry of Transportation and Infrastructure (MOTI) and other Provincial and/or Local Government proponents responsible to restore infrastructure in the affected areas

Financial responsibility for assessments is assumed by the following proponent:

Name: Gerry MacDougall A/Assistant Deputy Minister, South Area	Company: Forests, Lands, Natural Resource Operations and Rural Development (FLNRORD)
Address: 441 Columbia Street, Kamloops, BC V2C 2T3	
Phone: 250-267-8999	Fax or Email: Gerry.MacDougall@gov.bc.ca

CLIENT'S CERTIFICATION

I certify that I have read and concur with the content of this permit application, any amendments submitted to the Branch, and any other conditions the Minister may impose, as empowered by said Act.

Client Certification

Date: December 10, 2021	Client Name: Gerry MacDougall A/Assistant Deputy Minister, South Area	Client Affiliation: Forests, Lands, Natural Resource Operations and Rural Development (FLNRORD)	Client Signature:
--	--	--	----------------------------------

CERTIFICATION AND CONSENT

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Name: Gerry MacDougall		Company: Forests, Lands, Natural Resource	
A/Assistant Deputy Minister, South Area		Operations and Rural Development (FLNRORD)	
Address: 441 Columbia Street, Kamloops, BC V2C 2T3			
Phone: 250-267-8999		Fax or Email: Gerry.MacDougall@gov.bc.ca	
Date: December 10, 2021	Client Signature: 		



Additional Client Certification for Permits Issued under Section 12.2 of the Heritage Conservation Act

Select as appropriate:

☒ An application for a Heritage Investigation Permit **21A0694** has been submitted to the Branch by: **Sarah Fraser, A/Associate Deputy Minister, Ministry of Forests, Land, Natural Resource Operations and Rural Development (FLNRORD)**. It is currently described as:
Archaeological investigation of recovery activities undertaken in response to 2021's catastrophic rain resulting in widespread flooding and landslide events in British Columbia by the Ministry of Forests, Lands, Natural Resource Operations and Rural Development (FLNRORD), the Ministry of Transportation and Infrastructure (MoTI) and other Provincial and/or Local Government proponents responsible to restore infrastructure in the affected areas

Financial responsibility for assessments is assumed by the following proponent:

Name: Brent Persello, Environmental Services Manager	Company: Ministry of Transportation and Infrastructure (MoTI)
Address: 477 Columbia Street, Kamloops, BC V2C 2T3	
Phone: 778-362-4522	Fax or Email: Brent.Persello@gov.bc.ca

CLIENT'S CERTIFICATION

I certify that I have read and concur with the content of this permit application, any amendments submitted to the Branch, and any other conditions the Minister may impose, as empowered by said Act.

Client Certification

Date: December 8, 2021	Client Name: Brent Persello, Environmental Services Manager	Client Affiliation: Ministry of Transportation and Infrastructure (MoTI)	Client Signature: 
---	--	---	---

CERTIFICATION AND CONSENT

CLIENT'S CERTIFICATION

I certify that I have read and concur with the content of this permit application.

Client Certification.

Client Endorsement

For applications where there are no recorded archaeological sites, or where assessment is not required by another agency or under a Heritage Conservation Act Ministerial Order:

I acknowledge I have not been ordered to conduct a heritage inspection under S.12.3 of the Heritage Conservation Act and that I have commissioned an archaeological impact assessment on my own accord to facilitate my proposal to undertake the developments described herein.

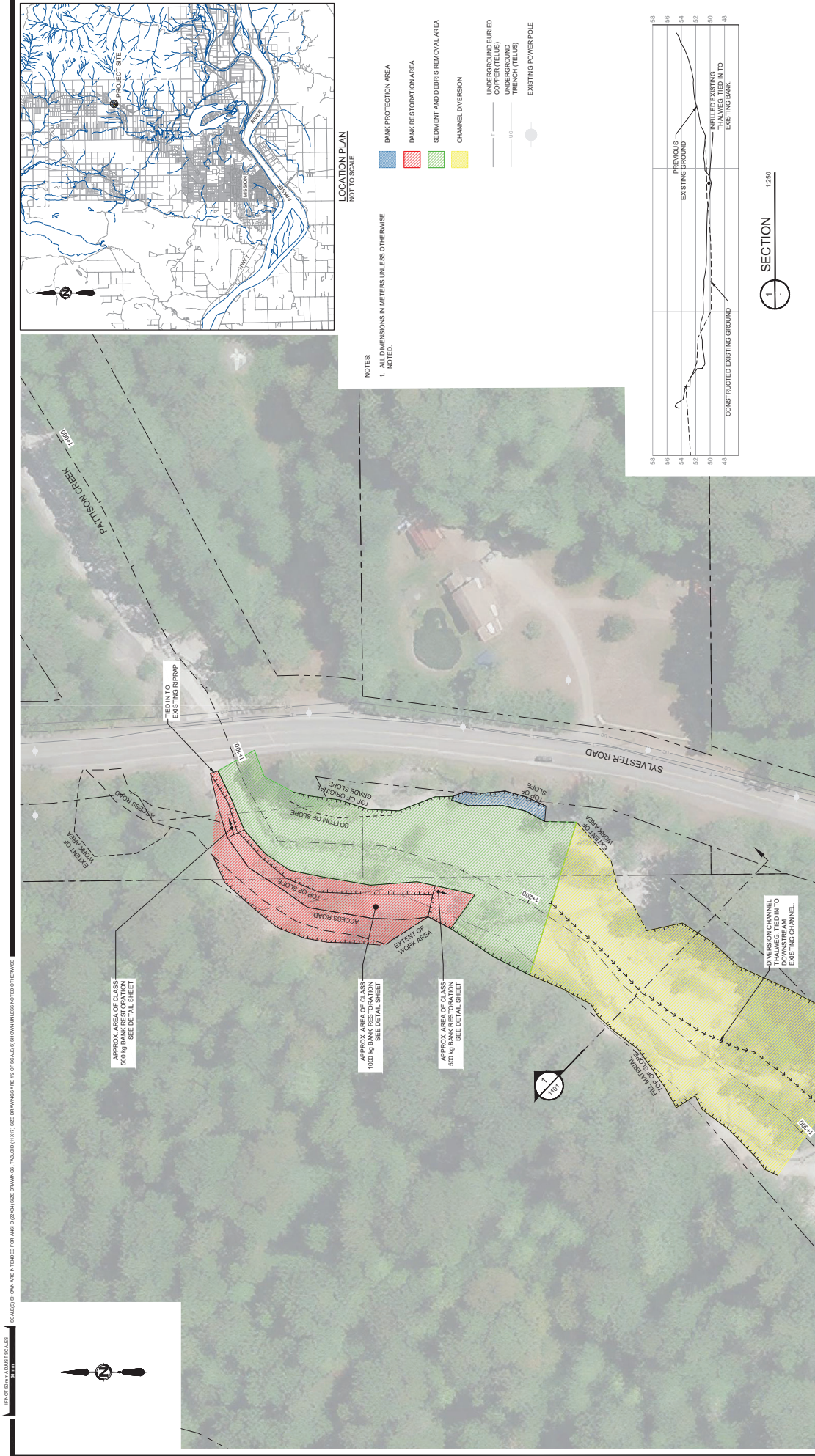
Name: Brent Persello, Environmental Services Manager		Company: Ministry of Transportation and Infrastructure (MoTI)
Address: 477 Columbia Street, Kamloops, BC V2C 2T3		
Phone: 778-362-4522		Fax or Email: <u>Brent.Persello@gov.bc.ca</u>
Date: December 8, 2021	Client Signature: 	

Appendix M

WATERWAY SEDIMENT ASSESSMENT PROPOSED EMERGENCY WORK S-CR-12 PATTISON CREEK

DRAWING INDEX		
SHEET	DRAWING NAME	DRAWING DESCRIPTION
GENERAL		
1	2402-00-G-1001	5 COVER
CIVIL		
2	2402-00-G-110	5 PLAN WITH AERIAL PHOTO
3	2402-00-G-110	5 PLAN WITH AERIAL PHOTO
4	2402-00-G-1500	5 DETAILS
5	2402-00-G-1500	5 DETAILS
		EMERGENCY WORKS
		EMERGENCY WORKS
		EMERGENCY WORKS

REV	DATE	DESIGN	DRAWN	DESCRIPTION	REVISION	SHEET
5	2023-03-31	A. WERNER	H. LEE	RECORD DRAWINGS		
4	2023-03-06	A. WERNER	H. LEE	REDESIGNED FOR CONSTRUCTION		
3	2023-03-20	T. FREEDMAN	J. WHITE	APPROVALS		
2	2023-03-02	A. WERNER	H. LEE	BOULEVARD FOR CONSTRUCTION		
1	2023-01-08	A. WERNER	J. WHITE	REDESIGNED FOR SECTION 11		
0	2023-03-08	N. WANDER	J. WHITE	BOULEVARD FOR PAVING		
DRAWING						
2482-00-G-1001						5 1



PERMIT TO PRACTICE
ASSOCIATED ENGINEERING B.C. LTD.
PERMIT NUMBER: 1000163
Engineers & Geoscientists BC

Associated Engineering

BEST MANAGED
FIRMS
2023

BRITISH COLUMBIA
pwc
WATERWAY SEDIMENT ASSESSMENT
PROPOSED EMERGENCY WORK
S-CR-12 PATTISON CREEK
2022-2462-00
SCALE: 1:500

PLAN WITH AERIAL PHOTO
EMERGENCY WORKS

2462-00-C-1101

REVISION 5

SHEET 2

NOTES

1. ALL DIMENSIONS IN METERS UNLESS OTHERWISE NOTED.

LOCATION PLAN
NOT TO SCALE

LEGEND

- BANK PROTECTION AREA
- BANK RESTORATION AREA
- SEDIMENT AND DEBRIS REMOVAL AREA
- CHANNEL DIVERSION
- UNDERGROUND BURIED COPPER (TELLUS)
- UNDERGROUND TRENCH (TELLUS)
- EXISTING POWER POLE

SECTION 1

1:250

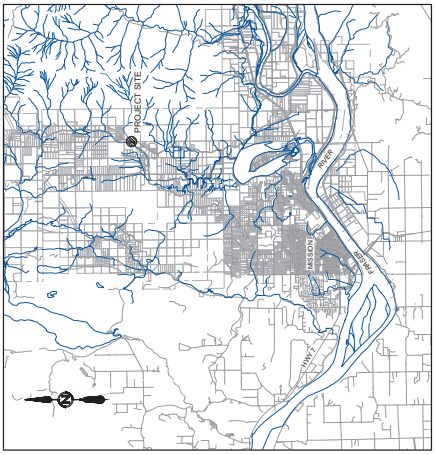
PREVIOUS EXISTING GROUND

INFILLED EXISTING THALWEG, TIED IN TO EXISTING BANK

CONSTRUCTED EXISTING GROUND



IF NOT DIMENSIONAL SCALES
0 10m
SCALES SHOWN ARE INTENDED FOR INFO USE ONLY. SCALES SHOWN ARE NOT TO SCALE UNLESS NOTED OTHERWISE.



LOCATION PLAN
NOT TO SCALE

NOTES:
1. ALL DIMENSIONS IN METERS UNLESS OTHERWISE NOTED.

- BANK PROTECTION AREA
- BANK RESTORATION AREA
- SEDIMENT AND DEBRIS REMOVAL AREA
- CHANNEL DIVERSION
- UNDERGROUND BURIED (CONDUIT/PIPE)
- UNDERGROUND TRENCH (TRENCH)
- EXISTING POWER POLE

PERMIT TO PRACTICE
ASSOCIATED ENGINEERING B.C. LTD.
PERMIT NUMBER: 1000163
Engineers & Geoscientists BC



REV	DATE	DESIGN	DRAWN	DESCRIPTION
1	2023-03-12	A. WONG	H. LEE	REVISION FOR APPROVALS
0	2023-03-12	A. WONG	H. LEE	REVISION FOR APPROVALS

THE SEAL AND SIGNATURE OF THE UNDERSIGNED ON THIS DRAWING CERTIFIES THAT THE DESIGN INFORMATION CONTAINED IN THESE DRAWINGS IS THE PROPERTY OF THE UNDERSIGNED AND THAT THE MATERIAL DESIGN CHANGES MADE DURING CONSTRUCTION HAVE BEEN BROUGHT TO THE UNDERSIGNED'S ATTENTION. THESE DRAWINGS ARE THE PROPERTY OF THE UNDERSIGNED AND ARE NOT TO BE REPRODUCED OR COPIED IN ANY MANNER WITHOUT THE WRITTEN PERMISSION OF THE UNDERSIGNED. MATERIAL DESIGN CHANGES, BUT NOT NECESSARILY ALL, ARE THE PROPERTY OF THE UNDERSIGNED. THE UNDERSIGNED DOES NOT WARRANT OR GUARANTEE, NOR ACCEPT ANY LIABILITY FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION PROVIDED IN THESE DRAWINGS. THE UNDERSIGNED'S LIABILITY IS LIMITED TO THE DESIGN AND CONSTRUCTION OF THE PROJECT AND DOES NOT EXTEND TO ANY OTHER MATTER. MATERIAL RESPECTS WITH THE ORIGINAL DESIGN INTENT.

PLAN
EMERGENCY WORKS

DRAWING	REVISION	SHEET
2462-00-C-1102	4	3

**SKETCH PLAN SHOWING ASBUILT OF TOPOGRAPHIC FEATURES OVER
LOT 1 NEW WESTMINSTER DISTRICT PLAN 13275,
REMAINDER SOUTH WEST QUARTER, BOTH IN SECTION 19 TOWNSHIP 21,
LOT A SECTION 24 TOWNSHIP 18 NEW WESTMINSTER DISTRICT PLAN LMP6149
AND CROWN LAND WITHIN TOWNSHIP 18**

PID: 009-791-183
CLIENT: SUMMIT EARTHWORKS INC.
CIVIC ADDRESS: 12172 SYLVESTER ROAD, FRASER VALLEY REGIONAL DISTRICT
DATE OF FIELD SURVEY: JANUARY 25 & FEBRUARY 2, 2023
FB: C439/73-78B

HORIZONTAL COORDINATE SYSTEM: UTM ZONE 10 N NAD83(CSRS) 2002
VERTICAL DATUM: CGVD28 (HTV2.0)

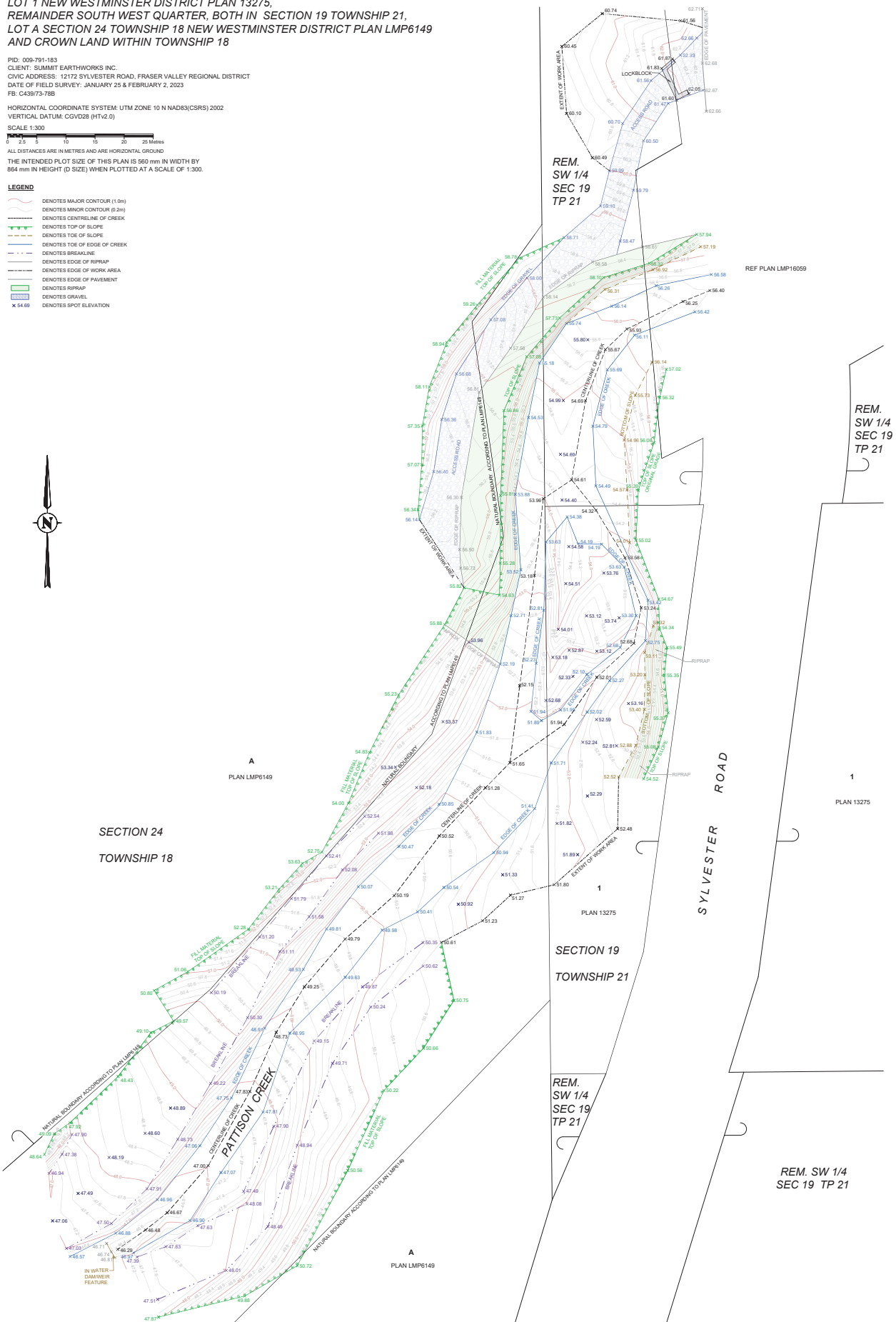
SCALE 1:300

0 5 10 15 20 25 METRES

ALL DISTANCES ARE IN METRES AND ARE HORIZONTAL GROUND
THE INTENDED PLOT SIZE OF THIS PLAN IS 560 mm IN WIDTH BY
864 mm IN HEIGHT (D SIZE) WHEN PLOTTED AT A SCALE OF 1:300.

LEGEND

- DENOTES MAJOR CONTOUR (1.0m)
- DENOTES MINOR CONTOUR (0.2m)
- DENOTES CENTRELINE OF CREEK
- DENOTES TOP OF SLOPE
- DENOTES TOE OF SLOPE
- DENOTES TOE OF EDGE OF CREEK
- DENOTES BREAKLINE
- DENOTES EDGE OF RIPRAP
- DENOTES EDGE OF WORK AREA
- DENOTES EDGE OF PAVEMENT
- DENOTES RIPRAP
- DENOTES GRAVEL
- X 54.69 DENOTES SPOT ELEVATION



REVISION #	DESCRIPTION	DATE
0	ORIGINAL ISSUE	2023-02-07

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CHRIS BEAUGRAND BOLS 1022
FEBRUARY 6, 2023



File: CW2201716SK1 Date: 2023/02/07

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Appendix H



Owner:	Ministry of Environment & Natural Resources (MoE)	Report No.:	1
Project:	Pattison Creek Emergency Works	Page:	1 of 2
Location:	Sylvester Road, Fraser Valley, BC 49° 13'27"N, 122°13'29"W	Project No.:	S-CR-28 2022-2632
Contractor:	Summit Earthworks	File No.:	
Contract:		Date:	December 14, 2022
Contract No.:		Temperature:	High: 4°C Low: -1°C
Weather:	Foggy patches in early am too sunny & clear the remainder of the day		

Labour Force: Summit: Foreman, First Aide Attendant

Contractor's Equipment: Two pick up trucks which includes First Aide Mobile Unit

1.0 Report:

- Arrived on site: 7:45 AM.
- Summit foreman on site 7:30 AM.- 12:30PM
- First Aide Attendant on site 7:30AM -11:30AM
- Lorne Semenowich (AE) departed site at 1:00 PM.
- Vector Geomatics/surveyors (2) on site 9:30AM – 1:30PM
- James Carmichael -Sartori on site
- Rick McKamey – Leq'a:mel First Nation

1.1 Downstream Extents – Summit Earthworks:

- Site Visit with Vector Geomatics surveyors , Sartori , Summit Earthworks and Leq'a:mel First Nation EM monitor

Summit discussed the general methodology involved establishment of streamflow adjacent to the bank, followed by removal of materials within the banks of the channel and stockpile of excavated materials adjacent to the access point on the northwest bank.

1.3 Environmental Monitoring

- James/Sartori was on site to do initial assessments (including snail survey monitoring ,water levels and water quality.

1.4 Archaeology / First Nations

Rick McKamey/Environment & Permitting Officer-Leq'a:mel on site to do initial assessment

2.0 Site Photographs



Figure 1
Looking upstream/easterly from west side of
bridge-Sartori rep



Figure 2
Looking downstream from the bridge -
Summit Works rep



Figure -3
Looking downstream on westerly limit



Figure -4
Looking upstream from the westerly limits



**Associated
Engineering**

*GLOBAL PERSPECTIVE.
LOCAL FOCUS.*

DAILY CONSTRUCTION REPORT



Owner:	Ministry of Environment & Natural Resources (MoE)	Report No.:	2
Project:	Pattison Creek Emergency Works	Page:	1 of 3
Location:	Sylvester Road, Fraser Valley, BC 49°13'27"N, 122°13'29"W	Project No.:	S-CR-28 2022-2632-01
Contractor:	Summit Earthworks	File No.:	
Contract:		Date:	December 15, 2022
Contract No.:		Temperature:	High: +4°C Low: -4°C
Weather:	Foggy patches in early am too sunny & clear the remainder of the day		

Labour Force: Summit: Foreman,

Contractor's Equipment: Pick up truck

Visitors: Terra Sensing- Surveyors – Lidar Mapping/locating creeks in the area

1.0 Report:

- Arrived on site: 7:30 AM.
- Summit foreman on site from 7:30 AM.- 11:30PM
- Lorne Semenowich (AE) departed site at 1:00 PM.
- Vector Geomatics/surveyors (2) on site from 9:00AM – 1:00PM

1.1 Downstream Extents – Summit Earthworks:

- Vector Geomatics surveyors to stake creek stations and completed survey control especially establishing vertical control stations for construction
- Summit flagged trees (1-2 inches in diameter) to be cut down for access road to creek

1.3 Environmental Monitoring

- James/Sartori to be on site from Monday, December 19th until project completion.

1.4 Archaeology / First Nations

- Rick McKamey/Environment & Permitting Officer-Leq'a:mel to be on site Friday, December 16th to do ongoing assessment



2.0 Site Photographs



Figure -1

Looking northerly under the bridge to excess material on north bank



Figure -2

Looking northeasterly to deposited material on north bank



Figure -3

Looking at Notice Board by Summit Earthworks

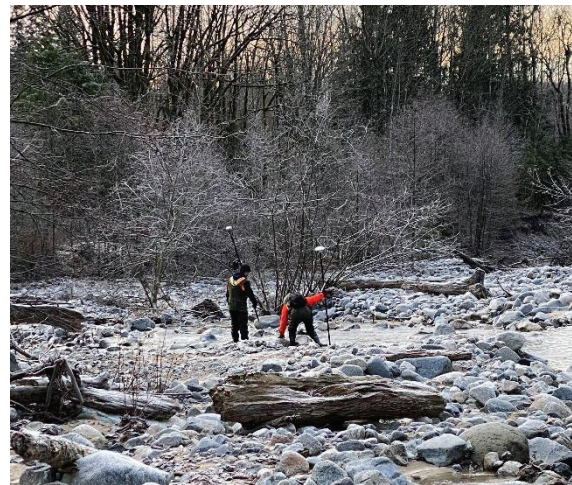


Figure 2-4

Looking at Terra surveying the current stream



Figure 5
Looking northerly at staked creek from the
southerly limit



Figure 6
Vector surveyor locating the bank



Owner:	Ministry of Environment & Natural Resources (MoE)	Report No.:	3
Project:	Pattison Creek Emergency Works	Page:	1 of 2
Location:	Sylvester Road, Fraser Valley, BC 49°13'27"N, 122°13'29"W	Project No.:	S-CR-28 2022-2632-01
Contractor:	Summit Earthworks	File No.:	
Contract:		Date:	December 16, 2022
Contract No.:		Temperature:	High: +2°C Low: -4°C
Weather:	Partly cloudy to foggy patches in early am too sunny & clear the remainder of the day		

Labour Force: Summit: Foreman, one Equipment Operator, 2x Traffic Safety Representatives, one First Aide attendant

Contractor's Equipment: Medic equipped truck
604 Traffic Control flaggers with road signage
Case CX245DSR excavator
Two Portable washrooms
Spill Kit

Visitors: Trevor Friedmann – AE Engineering
James Carmichael – Sartori
Stephanie Charleson - Sartori
Tina EV Monitor for Leq'a:mel First Nation
Rick McKamey/Environment & Permitting Officer-Leq'a:mel First Nation

1.0 Report:

- Arrived on site: 7:30 AM.
- Summit foreman on site from 7:30 AM.- 1:30PM
- Lorne Semenowich (AE) departed site at 1:30 PM.

1.1 Downstream Extents – Summit Earthworks:

- Summit pushed down dead trees with the excavator and cleared a path to the creek
- Summit cut down trees to create an access road to the creek
- Summit off loaded two portable washrooms
- Summit stockpiled the brush

1.3 Environmental Monitoring

- James & Stephanie were on site for Sartori were on site to monitor the construction works

1.4 Archaeology / First Nations

- Rick McKamey & Tina-Leq'a:mel were on site visit with Summit/AE

2.0 Site Photographs



Figure -1
Looking northerly at the start of the clearing



Figure -2
Looking at Mobile First Aide Vehicle



Figure -3
Looking northerly at the access clearing completed



Figure -4
Looking at excavator, Washrooms & spill kit in
access ramp area at day end



Owner:	Ministry of Environment & Natural Resources (MoE)	Report No.:	4
Project:	Pattison Creek Emergency Works	Page:	1 of 2
Location:	Sylvester Road, Fraser Valley, BC 49°13'27"N, 122°13'29"W	Project No.:	S-CR-28 2022-2632-01
Contractor:	Summit Earthworks	File No.:	
Contract:		Date:	December 19, 2022
Contract No.:		Temperature:	High: -9°C Low: -12°C
Weather:	Cloudy periods to snow flurries all day		

Labour Force: Summit: Foreman, three equipment Operator, 2x Traffic Safety Representatives, one First Aide attendant and labourer

Contractor's Equipment: Medic equipped truck
604 Traffic Control flaggers with road signage
Case CX245DSR excavator
John Deere 350G excavator
Link Belt 245x4 excavator
Doosan rock truck DA30 (stand-by -broke down)
Two Portable washrooms
Two Spill Kit
Medix portable/emergency Transport truck

Visitors:
Stephanie Charleson - Sartori
Tina EV Monitor for Leq'a: mel First Nation
Rick McKamey/Environment & Permitting Officer-Leq'a: mel First Nation

1.0 Report:

- Arrived on site: 7:30 AM.
- Summit foreman on site from 7:00 AM.- 4:30PM
- Lorne Semenowich (AE) departed site at 4:15 PM.

1.1 Downstream Extents – Summit Earthworks:

- Summit placed river rock on the cleared access road
- Summit off loaded two excavators & rock truck (7:45 to 8:25am)
- Summit cleared and grubbed the west side of the creek from 0+020 to 0+050 for access road

1.3 Environmental Monitoring

- Stephanie was on site for Sartori to inspect the creek crossing locations & monitor construction works

1.4 Archaeology / First Nations

- Rick McKamey & Tina-Leq'a: mel were on site monitor the construction

2.0 Site Photographs



Figure -1
Looking northerly at the low bed mobilizing equipment



Figure -2
Looking westerly at earth works – creating a work access

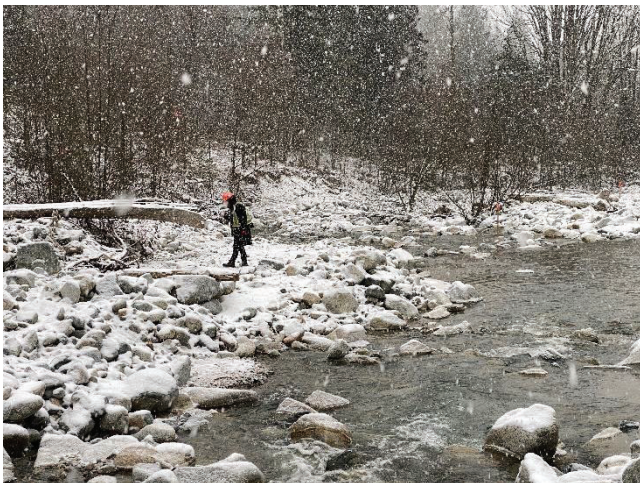


Figure -3
Looking southerly at Satori rep reviewing creek crossing at 0+030



Figure -4
Looking at excavator loading up the rock truck



DAILY CONSTRUCTION REPORT



Figure -5

Looking westerly at rock being placed for access ramp



Figure -6

Looking westerly at excavators moving rock truck to access ramp



Figure -7

Looking southerly at the new access ramp



Figure -8

Looking northerly on Sylvester Road one kilometre north of Loughheed –were snow drifting occurring with 40km/hr winds



Owner:	Ministry of Environment & Natural Resources (MoE)	Report No.:	5
Project:	Pattison Creek Emergency Works	Page:	1 of 1
Location:	Sylvester Road, Fraser Valley, BC 49°13'27"N, 122°13'29"W	Project No.:	S-CR-28 2022-2632-01
Contractor:	Summit Earthworks	File No.:	
Contract:		Date:	December 20, 2022
Contract No.:		Temperature:	High: -9°C Low: -14°C
Weather:	Snow flurries all day (26cm recorded snowfall)		

Labour Force: Summit: Foreman, three equipment operators,

Contractor's Equipment:

Case C 245DSR excavator
John Deere 350G excavator
Link Belt 245x4 excavator
Doosan rock truck DA30 (needing repair/service tomorrow)
Two Portable washrooms
Two Spill Kit

isitors: No reported today

1.0 Report:

- Arrived on Sylvester Road: 7:30 AM. Road blocked by cars & large snow drift (1.8m high)
- Summit foreman and three operators cleared snow off of the excavators

1.1 Downstream Extents – Summit Earthworks:

- No Activity

1.3 Environmental Monitoring

- No Activity

1.4 Archaeology / First Nations

- No Activity

2.0 Photographs: None Taken



Owner:	Ministry of Environment & Natural Resources (MoE)	Report No.:	6
Project:	Pattison Creek Emergency Works	Page:	1 of 2
Location:	Sylvester Road, Fraser Valley, BC 49°13'27"N, 122°13'29"W	Project No.:	S-CR-28 2022-2632-01
Contractor:	Summit Earthworks	File No.:	
Contract:		Date:	December 21, 2022
Contract No.:		Temperature:	High: -10°C Low: -13°C
Weather:	Sunny skies in the am to Partly cloudy/snowing in the pm (25cm accumadiation)		

Labour Force: Summit: Foreman, two equipment operators, and labourer

Contractor's Equipment: On site

Case C 245DSR excavator
John Deere 350G excavator
Link Belt 245x4 excavator
Doosan rock truck DA30 being serviced only
Two Portable washrooms
Two Spill Kit

Off-Site:

Liebherr 918 Excavator
John Deere 323E skid Steer

Visitors: No reported today

1.0 Report:

- Summit foreman set up two trail cams for security purposes
- Mechanic on site to repair & service the rock truck
- Two operators & labourer filling up mega bags off-site

1.1 Downstream Extents – Summit Earthworks:

- No Activity

1.3 Environmental Monitoring

- No Activity

1.4 Archaeology / First Nations

- No Activity

2.0 Site Photographs



Figure -1

Looking at the excavator filling up the meg bags



Figure -2

Looking at completed meg bags ready to go to the site



Owner:	Ministry of Environment & Natural Resources (MoE)	Report No.:	7
Project:	Pattison Creek Emergency Works	Page:	1 of 2
Location:	Sylvester Road, Fraser Valley, BC 49°13'27"N, 122°13'29"W	Project No.:	S-CR-28 2022-2632-01
Contractor:	Summit Earthworks	File No.:	
Contract:		Date:	December 22, 2022
Contract No.:		Temperature:	High: -8°C Low: -13°C
Weather:	Cloudy skies all day		

Labour Force: Summit: Foreman

Contractor's Equipment: (All equipment are shutdown due to weather)

Case C 245DSR excavator
John Deere 350G excavator
Link Belt 245x4 excavator
Doosan rock truck DA30 (stand-by -broke down)
Two Portable washrooms
Two Spill Kit

isitors: Vector Geomatics-surveyors (2)

1.0 Report:

- Arrived on site: 11:40 AM.
- Summit foreman on site from 11:30 AM.- 2:00PM
- Lorne Semenowich (AE) departed site at 2:15 PM.

1.1 Downstream Extents – Summit Earthworks:

- Summit placed river rock on the cleared access road

1.3 Environmental Monitoring

- No reporting today

1.4 Archaeology / First Nations

- No reporting today

2.0 Site Photographs



Figure -1
Looking northerly at the low bed mobilizing equipment



Figure -2
Looking westerly at earth works – creating a work access

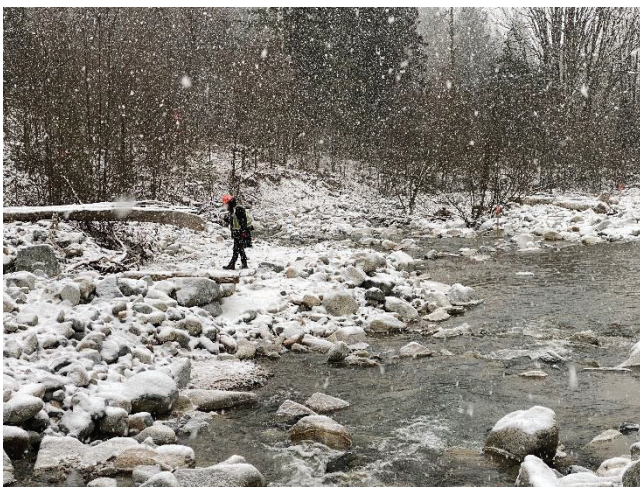


Figure -3
Looking southerly at Satori rep reviewing creek crossing at 0 030



Figure -4
Looking at excavator loading up the rock truck



Figure -
Looking westerly at rock being placed for access ramp



Figure -
Looking westerly at excavators moving rock truck to
access ramp



Figure -
Looking southerly at the new access ramp



Figure -
Looking northerly on Sylvester Road one kilometre
north of Loughheed –were snow drifting occurring
with 40km/hr winds



DAILY CONSTRUCTION REPORT

Owner:	Ministry of Environment & Natural Resources (MoE)	Report No.:	8
Project:	Pattison Creek Emergency Works	Page:	1 of 2
Location:	Sylvester Road, Fraser Valley, BC 49°13'27"N, 122°13'29"W	Project No.:	S-CR-28 2022-2632-01
Contractor:	Summit Earthworks	File No.:	
Contract:		Date:	January 3, 2023
Contract No.:		Temperature:	High: +5°C Low: -0°C
Weather:	Light Rain to Cloudy skies all day		

Labour Force: Summit: Foreman

Contractor's Equipment: (All equipment are shutdown due to weather)

Case CX245DSR excavator
John Deere 350G excavator
Link Belt 245x4 excavator
Doosan rock truck DA30
Two Portable washrooms
Two Spill Kit

Visitors: Satori

1.0 Report:

- Arrived on site: 7:40 AM.
- Summit foreman on site from 7:40 AM.- 8:45AM
- Lorne Semenowich (AE) departed site at 845AM.

1.1 Downstream Extents – Summit Earthworks:

- No Activity

1.3 Environmental Monitoring

- Satori toured the site with Summit foreman to review and assess two crossings

1.4 Archaeology / First Nations

- No reporting today

2.0 Site Photographs



Figure -1

Looking at the first crossing evaluation by Satori & Summit Earthworks



Figure -2

Looking northerly at creek west of the bridge

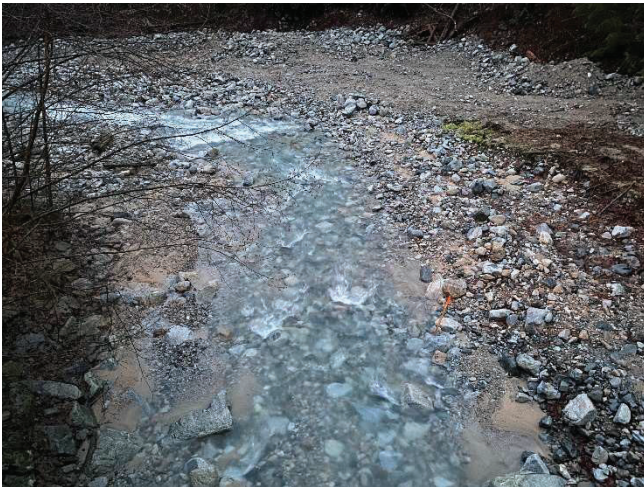


Figure -3

Looking down at the creek flows



Figure -4

Looking southerly at creek flows at 0+040



Owner:	Ministry of Environment & Natural Resources (MoE)	Report No.:	9
Project:	Pattison Creek Emergency Works	Page:	1 of 3
Location:	Sylvester Road, Fraser Valley, BC 49°13'27" N, 122°13'29" W	Project No.:	S-CR-28 2022-2632-01
Contractor:	Summit Earthworks	File No.:	
Contract:		Date:	January 5, 2023
Contract No.:		Temperature:	High: 7°C Low: 4°C
Weather:	Cloudy skies in the am to scattered showers in the pm		

Labour Force: Summit: Foreman, 4x operators, Medix, 2x flaggers

Contractor's Equipment:

Case C 245DSR excavator
John Deere 350G excavator
Link Belt 245x4 excavator
Doosan rock truck DA30
Two Portable washrooms
Two Spill Kit

isitors: Stephenie Charleson- Sartori
Tina Pederson -Leq'a: mel
Rick McKamey - Leq'a: mel
Andrew Wiens Project Manager AE
Dianna Christopoulos Project Coordinator AE
Savanna Hargrove Summit Earthworks
Two Flaggers from 604 Traffic Control

1.0 Report:

- Arrived on site: 7:30 AM.
- Summit foreman on site from 7:00 AM.- 4:30PM
- Site meeting was held with AE/Summit/Leq'a:mel regarding extension, and work methodology
- One operator left the site at 2:00PM
- Lorne Semenowich (AE) departed site at 4:05 PM.

1.1 Downstream Extents – Summit Earthworks:

- Summit placed river rock on the creek to bridge across on the east side near the bridge
- Excavator cleared up the east side near the bridge of debris and improved sloping
- Summit delivered 6 loads of rip rap (1000-500kg) and 2 loads of 300kg
- Summit stockpiled wood debris on the west bank at 0 020

1.3 Environmental Monitoring

- Stephenie Charleson was on site for Sartori
- Sartori monitors the water quality and survey the crossing for possible fish eggs

1.4 Archaeology / First Nations

- Tina Pederson was on site for Leq'a: mel

2.0 Site Photographs



Figure -1

Looking southerly at excavator crossing the creek
with rock bolder bridge with monitors



Figure -2

Looking southerly at first load of rip rap 00kg to
the site



Figure -3
Looking northerly at the cleaned east bank at 0 020
to 0 040



Figure -4
Looking at load of 300kg delivered to west bank



Figure -
Looking northerly at 00kg being delivered



Figure -
Looking southerly at created access road on the
creek



Owner:	Ministry of Environment & Natural Resources (MoE)	Report No.:	10
Project:	Pattison Creek Emergency Works	Page:	1 of 3
Location:	Sylvester Road, Fraser Valley, BC 49°13'27" N, 122°13'29" W	Project No.:	S-CR-28 2022-2632-01
Contractor:	Summit Earthworks	File No.:	
Contract:		Date:	January 6, 2023
Contract No.:		Temperature:	High: 7°C Low: 4°C
Weather:	Cloudy skies in the am to scattered showers in the pm		

Labour Force: Summit: Foreman, 3x operators, Medix,

Contractor's Equipment:

Case C 245DSR excavator
John Deere 350G excavator
Link Belt 245x4 excavator
Doosan rock truck DA30
Two Portable washrooms
Two Spill Kit

Visitors: Stephenie Charleson- Sartori
Tina Pederson -Leq'a: mel
Jason Thompson - Leq'a: mel
Jamie deGroot Summit Earthworks
Savanna Hargrove Summit Earthworks

1.0 Report:

- Arrived on site: 7:30 AM.
- Summit foreman on site from 7:00 AM.- 4:30PM
- Lorne Semenowich (AE) departed site at 4:25 PM.

1.1 Downstream Extents – Summit Earthworks:

- Summit placed river rock on the creek to bridge across on the east side at Erosion protection site at 0 075
- Excavator removed debris and two trees (with 5cm diameter side with exposed root ball)
- Excavator built the Erosion protection on east bank from 0 068 to 0 088 with the rip rap
- Summit stockpiled wood debris on the west bank to road ramp

1.3 Environmental Monitoring

- Stephenie Charleson was on site for Sartori
- Sartori monitors the water quality and survey the crossing for possible fish eggs

1.4 Archaeology / First Nations

- Tina Pederson(pm)/Jason Thompson(am) were on site for Leq'a: mel

2.0 Site Photographs



Figure -1
Looking westerly at the unloading of debris



Figure -2
Looking westerly at the building of rock bridge



Figure -3
Looking northerly at passing of rip-rap across the
creek



Figure -4
Looking at tree removal



Figure -
Looking easterly at start of rip rap placement- keying
in



Figure -
Looking westerly at first pieces of rip rap placed



Figure -
Looking easterly at the December 1th before
construction



Figure -
Looking easterly at the completed placement of rip
rap on east bank -erosion protection



Owner:	Ministry of Environment & Natural Resources (MoE)	Report No.:	10
Project:	Pattison Creek Emergency Works	Page:	1 of 3
Location:	Sylvester Road, Fraser Valley, BC 49°13'27" N, 122°13'29" W	Project No.:	S-CR-28 2022-2632-01
Contractor:	Summit Earthworks	File No.:	
Contract:		Date:	January 9, 2023
Contract No.:		Temperature:	High: 7°C Low: 1°C
Weather:	Cloudy skies in the am to scattered showers in the pm		

Labour Force: Summit: Foreman, 3x operators, Medix,

Contractor's Equipment:

Case C 245DSR excavator
John Deere 350G excavator
Link Belt 245x4 excavator (2 hours)
Doosan rock truck DA30
Two Portable washrooms
Two Spill Kit

Visitors: Stephenie Charleson- Sartori
Jason Thompson - Leq'a: mel

1.0 Report:

- Arrived on site: 7:30 AM.
- Summit foreman on site from 7:00 AM.- 4:00PM
- Lorne Semenowich (AE) departed site at 3:35 PM.

1.1 Downstream Extents – Summit Earthworks:

- Excavator removed debris and small trees 0 200 to 0 080
- Summit stockpiled wood debris on the west bank at the road ramp
- Estimated diversion channel / bank restoration works progress 20
- Estimated rip rap placement progress 25

1.3 Environmental Monitoring

- Stephenie Charleson was on site for Sartori
- Satori monitor the water quality of the creek during wood debris removal in the creek

1.4 Archaeology / First Nations

- Jason Thompson(am) was on site for Leq'a: mel

2.0 Site Photographs



Figure -1

Looking southerly at the tree removal at 0 200 end of project and new outfall location



Figure -2

Looking northerly of debris being moved to the stockpile via rock truck



Figure -3

Looking at found tarp in the creek



Figure -4

Looking at removed tarp on shore



Figure -
Looking southerly at debris removal at 0 100



Figure -
Looking at wood stockpile



Figure -
Looking at 0 200 before tree removal at creek edge



Owner:	Ministry of Environment & Natural Resources (MoE)	Report No.:	12
Project:	Pattison Creek Emergency Works	Page:	1 of 3
Location:	Sylvester Road, Fraser Valley, BC 49°13'27" N, 122°13'29" W	Project No.:	S-CR-28 2022-2632-01
Contractor:	Summit Earthworks	File No.:	
Contract:		Date:	January 10, 2023
Contract No.:		Temperature:	High: 11°C Low: 5°C
Weather:	Clear & sunny skies all day		

Labour Force: Summit: Foreman, 3x operators (operator at 4hours), Medix,

Contractor's Equipment:

Case C 245DSR excavator
John Deere 350G excavator
Link Belt 245x4 excavator (2 hours)
Doosan rock truck DA30
Two Portable washrooms
Two Spill Kit

isitors: Stephenie Charleson- Sartori
Jason Thompson - Leq'a: mel
Traffic controllers (2) 604 Traffic Control
Tina Pederson, Leq'a:mel
Rick McKamey – Leq'a:mel
Trevor Friedmann – Associated Engineering
Savana Hargrove - Summit

1.0 Report:

- Arrived on site: 7:30 AM.
- Summit super was on site from 7:00 AM.- 5:30PM
- Lorne Semenowich (AE) departed site at 4:30 PM.
- On Site Meeting with AE/Leq'a:mel/Satori in the am on outfall and infill area
- On Site Meeting with AE/Summit/Satori in the pm on outfall and infill areas

1.1 Downstream Extents – Summit Earthworks:

- Excavator removed debris and small trees at the outfall area 0 200
- Summit hauled away four loads of wood debris at the road ramp to Mission Landfill
- Summit placed 25kg (natural) rock at 0 030 to 0 080 on the west bank
- Summit delivered mega bags (26) to site

Project Status:

- Estimated diversion channel / bank restoration works progress 20
- Estimated rip rap placement progress 25

1.3 Environmental Monitoring

- Stephenie Charleson was on site for Sartori
- Sartori monitored the water quality of the creek during wood debris removal in the creek

1.4 Archaeology / First Nations

- Jason Thompson was on site for Leq'a: mel

2.0 Site Photographs



Figure -1
Looking westerly at the debris/tree loading



Figure -2
Looking southerly at meg bags being off loaded



604 TRAFFIC CONTROL

MUSTER POINT LOCATION: bulletin board.

Daily Toolbox / Traffic Risk Assessment

Date: Jan 10/23 Job #: _____ Location: Pattison Creek - Sylvester Mission Shift Hours: 7:30A to _____
Contractor: Summit Earthwork Foreman: C. EOP Foreman Ph #: 204 662 78

Check ALL that apply

WIND	WEATHER	PPE WORN/INSPECTED	EQUIPMENT USED
Calm	Sunny	Hard Hat	Signs
Light	Partly Cloudy	High Visibility Vest	Tripod
Moderate	Cloudy	Steel Toe Boots	Windmaster
Strong	Rain	Ankle Bands	F.A.B.
	Fog	Wrist Bands	TCP Paddle
	Icy	Ear Plugs	Radios
	Glare	Safety Glasses	Flashlight/Wand
	Snow	Whistle	

Check applicable answer

SCOPE OF WORK	Yes	No
Discussed with all	☒	☐
Understood by all	☒	☐
Discussed Positioning	☒	☐
Discussed Escape Route	☒	☐
Overlapping Work Zones	☒	☐
Plan made/reviewed with overlapping work crews	☒	☐
Discussed Muster Point	☒	☐

First Aid Attendant: _____
Phone #: _____
Nearest Hospital: Abas
First Aid Kit Location: Truck 07.

Employee Name: _____ TCP SN# and Expiry: _____ Signature: _____
Dana 1707573 Feb 25
Leanne 1093919 Dec 24

Work Requiring Traffic Control:
hold traffic when here.

Traffic Control Zone Check & Deficiencies

	Yes	No
1. Time	☒	☐
2. Time	☒	☐
3. Time	☒	☐

Employee Hazards

	Yes	No	Comments/Controls
Extreme Heat	☒	☐	
Dehydration	☒	☐	
UV Skin Exposure	☒	☐	
Cool Down Area	☒	☐	
Extreme Cold	☒	☐	
Warm Clothing	☒	☐	
Warm Up Area	☒	☐	
Slippery Work Zone	☒	☐	

RISK CATEGORY

	EMERGENT / BRIEF DURATION WORK TRAFFIC RISK ASSESSMENT	CRITERIA
1) Work Duration	Can the work be completed in 5 minutes or less?	☐ YES
2) Slight Distance	For posted speed limit, is the minimum distance met? Def: Sight Distance: Distance from parked location to furthest point that can be seen on the road.	☐ YES
3) Traffic Volume	Is the traffic volume in lanes that will be entered by workers estimated to be less than 5 vehicles per lane, per minute?	☐ YES
4) Environ. Conditions	Is visibility unrestricted (no fog, blowing snow, etc.) AND are road conditions not slippery?	☐ YES

RISK EVALUATION / CORRECTIVE MEASURES (Select one option below based on risk criteria answers above)

☐ Answers to all risk criteria questions are YES: Traffic control devices may be installed to **Emergent Work** traffic control layout.

☐ Answers to one or two risk criteria questions are NO: Traffic control devices may be installed to **Brief Duration Work** traffic layouts.

☐ Answers to Three or More Risk Criteria Questions are NO: Additional traffic control measures are required beyond those described and illustrated for Emergent or Brief-Duration Work. Standard layouts for Short Duration, Long Duration, or Mobile Work should be applied.

SITE 1 **SITE 2**

FOREMAN APPROVAL: C. EOP

Sylvester Rd.

C-018-11A

C-029

C-0011

C-029

WORK ZONE

Figure -3

Looking at Daily Toolbox Form for the flaggers



Owner:	Ministry of Environment & Natural Resources (MoE)	Report No.:	13
Project:	Pattison Creek Emergency Works	Page:	1 of 3
Location:	Sylvester Road, Fraser Valley, BC 49°13'27" N, 122°13'29" W	Project No.:	S-CR-28 2022-2632-01
Contractor:	Summit Earthworks	File No.:	
Contract:		Date:	January 11, 2023
Contract No.:		Temperature:	High: 5°C Low: 0°C
Weather:	Partly cloudy skies in the am to partly sunny skies to cloudy skies in the pm		

Labour Force: Summit: Foreman, 3x operators (operator at 4hours), Medix,

Contractor's Equipment:

Case C 245DSR excavator
John Deere 350G excavator
Link Belt 245x4 excavator
Doosan rock truck DA30
Two Portable washrooms
Two Spill Kits

Visitors: Stephenie Charleson- Sartori
Jason Thompson - Leq'a: mel
Traffic controllers (2) 604 Traffic Control
Tina Pederson, Leq'a:mel
Rick McKamey – Leq'a:mel
Trevor Friedmann – Associated Engineering
Savana Hargrove – Summit
James Carmichael - Sartori

1.0 Report:

- Arrived on site: 7:30 AM.
- Summit super was on site from 7:00 AM.- 4:00PM
- Lorne Semenowich (AE) departed site at 3:30 PM.
- On Site Meeting with AE/Leq'a:mel/Satori in the am on outfall and infill area

1.1 Downstream Extents – Summit Earthworks:

- Excavator removed debris and small trees at the outfall area 0 200 to 0 0100 west bank
- Summit hauled wood debris to stockpile at the road entrance ramp
- Summit placed the mega bags (6) at the creek edge at 0 090 – west bank

Project Status:

- Estimated diversion channel / bank restoration works progress 20
- Estimated rip rap placement progress 25

1.3 Environmental Monitoring

- Stephenie Charleson was on site for Sartori
- Sartori monitored the water quality of the creek during tree removal in the creek

1.4 Archaeology / First Nations

- Jason Thompson was on site for Leq'a: mel

2.0 Site Photographs



Figure -1
Looking southerly at the meg bags on site



Figure -2
Looking northerly at meg bags in place



Figure -3

Looking at upper section with meg bags at 0 0 0
west bank



Figure -4

Looking at removed trees at the outfall 0 01 0



Owner:	Ministry of Environment & Natural Resources (MoE)	Report No.:	14
Project:	Pattison Creek Emergency Works	Page:	1 of 2
Location:	Sylvester Road, Fraser Valley, BC 49°13'27" N, 122°13'29" W	Project No.:	S-CR-28 2022-2632-01
Contractor:	Summit Earthworks	File No.:	
Contract:		Date:	January 12, 2023
Contract No.:		Temperature:	High: 9°C Low: 5°C
Weather:	Rain showers all day		

Labour Force: Summit: Foreman, 2x operators, Medix,

Contractor's Equipment:

Case C 245DSR excavator
John Deere 350G excavator
Link Belt 245x4 excavator
Doosan rock truck DA30
Two Portable washrooms
Two Spill Kits

Visitors: Stephenie Charleson- Sartori
Jason Thompson - Leq'a: mel

1.0 Report:

- Arrived on site: 7:30 AM.
- Summit super was on site from 7:00 AM.- 9:00AM
- Lorne Semenowich (AE) departed site at 8:30 AM.

1.1 Downstream Extents – Summit Earthworks:

- Operators discovered the Excavator batteries were stolen out of 3 excavators and work did not start

Project Status:

- Estimated diversion channel / bank restoration works progress 20
- Estimated rip rap placement progress 25

1.3 Environmental Monitoring

- Stephenie Charleson was on site for Sartori – no activity to report



1.4 Archaeology / First Nations

- Jason Thompson was on site for Leq'a: mel – no activity to report

2.0 Site Photographs



Figure -1

Looking southerly at the equipment on site



Owner:	Ministry of Environment & Natural Resources (MoE)	Report No.:	15
Project:	Pattison Creek Emergency Works	Page:	1 of 4
Location:	Sylvester Road, Fraser Valley, BC 49°13'27" N, 122°13'29" W	Project No.:	S-CR-28 2022-2632-01
Contractor:	Summit Earthworks	File No.:	
Contract:		Date:	January 13, 2023
Contract No.:		Temperature:	High: +10°C Low: +5°C
Weather:	Rain all day (approximately 20mm of rain fell)		

Labour Force: Summit: Foreman, 2x operators, Labourer, Medix,

Contractor's Equipment:

Case CX245DSR excavator
John Deere 350G excavator
Link Belt 245x4 excavator
Doosan rock truck DA30
Two Portable washrooms
Two Spill Kit

Visitors: Stephenie Charleson- Sartori
Tina Pederson -Leq'a: mel
Ed Jones - Summit Earthworks
Savanna Hargrove Summit Earthworks
Ryan Ford, Gabriel Trewner & James Carmichael – Sartori
Trevor Friedman – Associated Engineering

1.0 Report:

- Arrived on site: 7:35 AM.
- Summit foreman on site from 7:00 AM.- 5:30PM
- Lorne Semenowich (AE) departed site at 5:00 PM.

1.1 Downstream Extents – Summit Earthworks:

- Summit placed river rock on the creek to bridge across on the east side at Erosion protection site at 0+075
- Excavator dug out the new design alignment of the creek at the outfall from 0+0200 to 0+0170
- Excavator loaded up debris onto tandem truck (two loads) to take to the Mission Landfill
- Labourer set up & maintained a 4inch pump in the excavation
- Site Tour by AE/Sartori/Summit regarding constructed alignment

1.3 Environmental Monitoring

- Stephenie Charleson was on site for Sartori
- Sartori monitors the water quality and survey the crossing for possible fish eggs

- Sartori crew set up fish net across the creek at 0+085 but cancelled due to high flow of the creek

1.4 Archaeology / First Nations

- Tina Pederson(pm) was on site for Leq'a: mel

2.0 Site Photographs

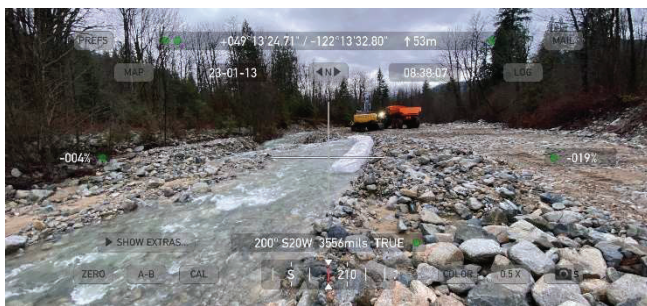


Figure -1

Looking southerly at meg bags at 0+0150 to 0+0135

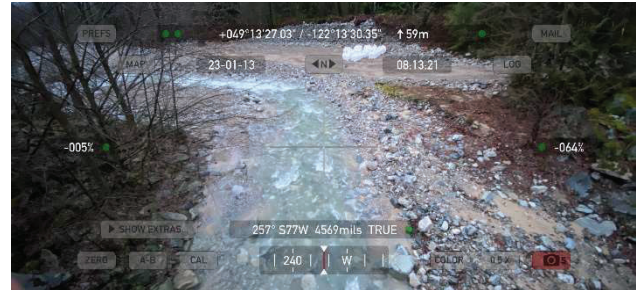


Figure -2

Looking down from the bridge at first bend of the creek at 0+000 to 0+050



Figure -3

Looking northerly at start of the excavation



Figure -4

Looking at laser giving grade & outfall 0+0200



Figure -5
Looking northerly at fish nets

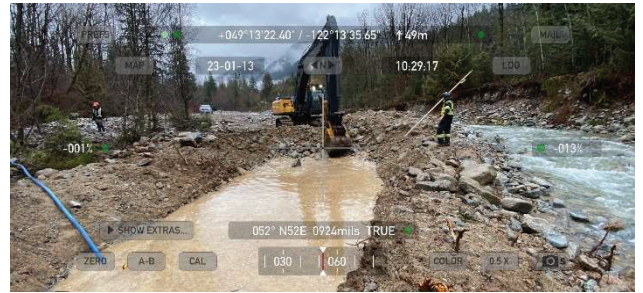


Figure -6
Looking northerly at first 15m of creek design excavation



Figure -7
Looking southerly at the remainder debris stockpile



Figure -8
Looking easterly at the pumped-out settlement water



Figure -9
Looking westerly at pumped out excess water settlement



Figure -10
Looking northerly at first 20m of creek design excavation



Figure -11
Looking northerly at installed settlement fencing



Figure -12
Looking westerly at the end of day servicing of equipment



Owner:	Ministry of Environment & Natural Resources (MoE)	Report No.:	16
Project:	Pattison Creek Emergency Works	Page:	1 of 4
Location:	Sylvester Road, Fraser Valley, BC 49°13'27" N, 122°13'29" W	Project No.:	S-CR-28 2022-2632-01
Contractor:	Summit Earthworks	File No.:	
Contract:		Date:	January 16, 2023
Contract No.:		Temperature:	High: +6°C Low: +4°C
Weather:	Rained in the am and partly cloudy in the pm (approximately 15mm of rain fell)		

Labour Force: Summit: Foreman, 2x operators, Labourer, Medix,

Contractor's Equipment:

Case CX245DSR excavator
John Deere 350G excavator
Link Belt 245x4 excavator- not in use
Doosan rock truck DA30 – not in use
Two Portable washrooms
Two Spill Kit

Visitors:

Stephenie Charleson- Sartori
Jason Thompson +3 others -Leq'a: mel
Savanna Hargrove & Jamie DeGroot-Summit Earthworks
Ryan Ford, Gabriel Trewner & James Carmichael – Sartori
Security staff during the night and weekend long
Two Summit truck drivers

1.0 Report:

- Arrived on site: 7:20 AM.
- Summit foreman on site from 7:00 AM.- 5:30PM
- Lorne Semenowich (AE) departed site at 4:45 PM.

1.1 Downstream Extents – Summit Earthworks:

- Summit excavated the remainder of diversion channel to 0+0120
- Summit opened up the new diversion channel.
- Summit trucks delivered 19 loads of rip rap.

1.3 Environmental Monitoring

- Stephenie Charleson was on site for Sartori
- Sartori monitors the water quality.
- Sartori crew set up fish net across the creek at 0+085 and proceed to savage fish from infill stream area

1.4 Archaeology / First Nations

- Jason Thompson was on site for Leq'a: mel.

2.0 Site Photographs



Figure -1
Looking at delivery of 1000kg rip rap to site



Figure -2
Looking at opening of downstream/outflow of the diversion channel

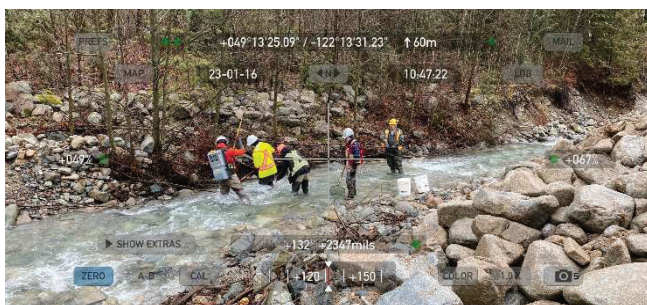


Figure -3
Looking at start of the fish salvage of infill stream



Figure -4
Looking at recovered coho from infill stream

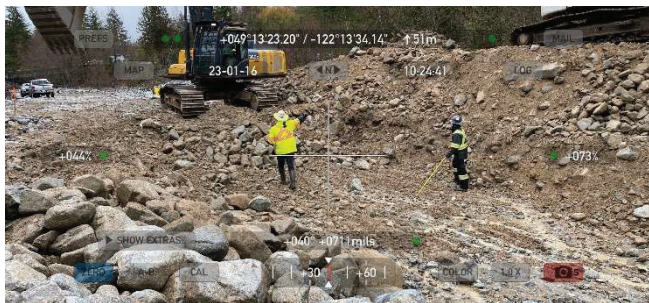


Figure -5
Looking at diversion channel under construction

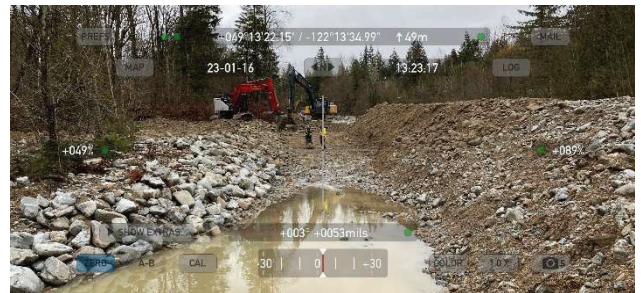


Figure -6
Looking northerly at diversion channel at 0+0150



Figure -7
Looking northerly at the opening to water on the new channel

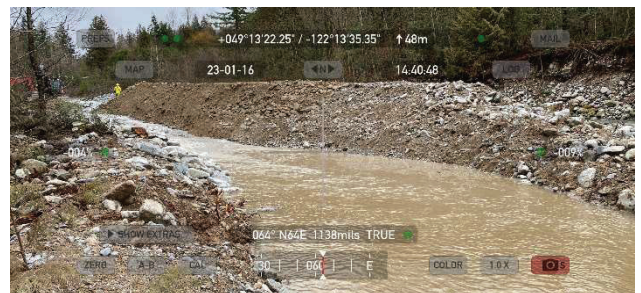


Figure -8
Looking northerly at the new water flow in diversion channel



Associated
Engineering

GLOBAL PERSPECTIVE.
LOCAL FOCUS.

DAILY CONSTRUCTION REPORT



Figure -9
Looking westerly at pumped out excess water settlement



Figure -10
Looking northerly at first 20m of creek design excavation



Figure -11
Looking northerly at installed settlement fencing



Figure -12
Looking westerly at the end of day servicing of equipment



Owner:	Ministry of Environment & Natural Resources (MoE)	Report No.:	17
Project:	Pattison Creek Emergency Works	Page:	1 of 4
Location:	Sylvester Road, Fraser Valley, BC 49°13'27" N, 122°13'29" W	Project No.:	S-CR-28 2022-2632-01
Contractor:	Summit Earthworks	File No.:	
Contract:		Date:	January 17, 2023
Contract No.:		Temperature:	High: +7°C Low: +1°C
Weather:	Scattered showers all day (approximately 17mm of rain fell)		

Labour Force: Summit: Foreman, 2x operators, Labourer, Medix,

Contractor's Equipment:

Case CX245DSR excavator- on standby
John Deere 350G excavator
Link Belt 245x4 excavator – not used
Doosan rock truck DA30 – not used
Two Portable washrooms
Two Spill Kit

Visitors:

Stephenie Charleson- Sartori
Jason Thompson/ Rick McKamey -Leq'a: mel
Jamie DeGroot - Summit Earthworks
Savanna Hargrove Summit Earthworks
Jeffrey Kim, Gabriel Trewner – Sartori
Trevor Friedman – Associated Engineering

1.0 Report:

- Arrived on site: 7:30 AM.
- Summit foreman on site from 7:00 AM.- 5:30PM
- Lorne Semenowich (AE) departed site at 3:45 PM.

1.1 Downstream Extents – Summit Earthworks:

- Excavator dug out the new design alignment of the creek at the outfall from 0+0120 to 0+0110
- Excavator placed additional riprap at 0+0190 to 0+0180
- Excavator moved meg bags from 0+120- 0+130
- Site Tour by AE/Sartori/Summit regarding constructed alignment, and rip rap section
- Site Tour by AE/Sartori/Summit for Rick McKamey Leq'a: mel
- Site Tour for Summit PM and foreman on progress

1.3 Environmental Monitoring

- Stephenie Charleson was on site for Sartori
- Sartori monitors the water quality
- Sartori crew salvaged more fish net on the existing alignment and confirmed at noon to proceed to do infill works

1.4 Archaeology / First Nations

- Jason Thompson was on site for Leq'a: mel

Project Status:

- Estimated diversion channel / bank restoration works progress = 50%
- Estimated rip rap placement progress = 25%

2.0 Site Photographs



Figure -1
Looking easterly at upstream fish net



Figure -2
Looking southerly at Sartori doing fish salvage in the infill section at low water



Figure -3
Looking southerly at infill section



Figure -4
Looking southerly at downstream section creek -
infill section -east bank

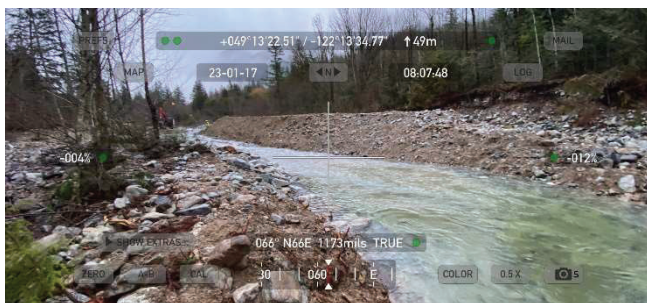


Figure -5
Looking northerly at infill section (right side)



Figure -6
Looking northerly at west bank being sloped to 2:1

DAILY CONSTRUCTION REPORT



Figure -7
Looking northerly at the west bank of diversion



Figure -8
Looking westerly at the west bank sloping



Figure -9
Looking westerly at pumped out excess water settlement



Figure -10
Looking northerly at first 20m of creek design excavation



Figure -11
Looking northerly at installed settlement fencing



Figure -12
Looking westerly at the end of day servicing of equipment



Owner:	Ministry of Environment & Natural Resources (MoE)	Report No.:	18
Project:	Pattison Creek Emergency Works	Page:	1 of 4
Location:	Sylvester Road, Fraser Valley, BC 49°13'27" N, 122°13'29" W	Project No.:	S-CR-28 2022-2632-01
Contractor:	Summit Earthworks	File No.:	
Contract:		Date:	January 18, 2023
Contract No.:		Temperature:	High: +6°C Low: +4°C
Weather:	Scattered showers all day		

Labour Force: Summit: Foreman, 2x operators, Labourer, Medix,

Contractor's Equipment:

Case CX245DSR excavator
John Deere 350G excavator
Link Belt 245x4 excavator – not used
Doosan rock truck DA30 – not used
Two Portable washrooms
Two Spill Kit

Visitors: Stephenie Charleson- Sartori
Jamie DeGroot - Summit Earthworks
Savanna Hargrove Summit Earthworks

1.0 Report:

- Arrived on site: 7:30 AM.
- Summit foreman on site from 7:00 AM.- 3:30PM
- Lorne Semenowich (AE) departed site at 3:10 PM.

1.1 Downstream Extents – Summit Earthworks:

- Excavator started on backfilling of the infill works.
- Labourer set up pump at the downstream area on the infill section.
- Excavator moved meg bags from 0+080- 0+070

1.3 Environmental Monitoring

- Stephenie Charleson was on site for Sartori.
- Sartori monitors the water quality.
- Sartori recorded high turbidity (+559ntu) at noon
- AE/LDS contacted PM regarding situation of the upstream conditions Recommended to cease work at 2:30pm

1.4 Archaeology / First Nations

- No representative on site for Leq'a: mel today

Project Status:

- Estimated diversion channel / bank restoration works progress = 55%
- Estimated rip rap placement progress = 25%

2.0 Site Photographs



Figure -1
Looking southerly at clear water at 8:38am

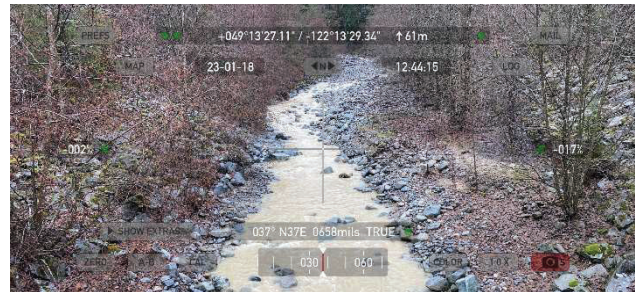


Figure -2
Looking upstream at 12:44 with high turbidity from the bridge

DAILY CONSTRUCTION REPORT

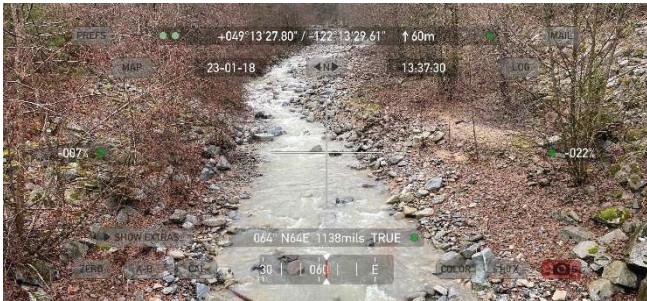


Figure -3
Looking upstream at 1:37pm turbidity settling



Figure -4
Looking northerly at infill at 50% complete



Figure -5
Looking at mid section of the infill works



Figure -6
Looking easterly at down stream section of the infill-east bank

DAILY CONSTRUCTION REPORT



Figure -7

Looking easterly at the south section of the infill -east bank



Figure -8

Looking northeasterly at the north section of the infill - west section



Figure -9
Looking westerly at pumped out excess water settlement



Figure -10
Looking northerly at first 20m of creek design excavation



Figure -11
Looking northerly at installed settlement fencing



Figure -12
Looking westerly at the end of day servicing of equipment



Owner:	Ministry of Environment & Natural Resources (MoE)	Report No.:	19
Project:	Pattison Creek Emergency Works	Page:	1 of 4
Location:	Sylvester Road, Fraser Valley, BC 49°13'27" N, 122°13'29" W	Project No.:	S-CR-28 2022-2632-01
Contractor:	Summit Earthworks	File No.:	
Contract:		Date:	January 19, 2023
Contract No.:		Temperature:	High: +6°C Low: +3°C
Weather:	Rain showers in the am to mix of partly cloudy to scattered showers in the pm		

Labour Force: Summit: Foreman, 2x operators (one from 7:30-5pm & second 11am -5pm) Labourer, Medix, 2x truckers

Contractor's Equipment:

Case CX245DSR excavator- demob from site in the am.
John Deere 350G excavator
Link Belt 245x4 excavator
Doosan rock truck DA30 – demob from the site in the am
Two Portable washrooms
Two Spill Kit

Visitors: Stephenie Charleson- Sartori
Jason Thompson/ Rick McKamey -Leq'a: mel
Jamie DeGroot - Summit Earthworks
604 Traffic Control flaggers (2)

1.0 Report:

- Arrived on site: 7:20 AM.
- Summit foreman on site from 7:00 AM.- 5:00PM
- Lorne Semenowich (AE) departed site at 4:20 PM.

1.1 Downstream Extents – Summit Earthworks:

- Excavators completed sloping the infill area
- Excavator sorted riprap material of 1000kg
- Excavator moved meg bags from 0+120- 0+110
- Summit delivered to site 8" rock (2-loads) and 1000kg rock (14 loads)
- Summit photographed the upstream by drone
- Summit prepared an evacuation plan prior to commencing work due to high turbidity upstream yesterday and extreme safety precautions (proceeded at 10:20am previously on standby from 7:30am)
- Site Tour by AE/Sartori/Summit for Rick McKamey Leq'a: mel in the am

1.3 Environmental Monitoring

- Stephenie Charleson was on site for Sartori.
- Sartori monitors the water quality.

1.4 Archaeology / First Nations

- Jason Thompson was on site for Leq'a: mel.

Project Status:

- Estimated diversion channel / bank restoration works progress = 60%
- Estimated rip rap placement progress = 25%

2.0 Site Photographs



Figure -1
Looking southerly at demob of Rock truck

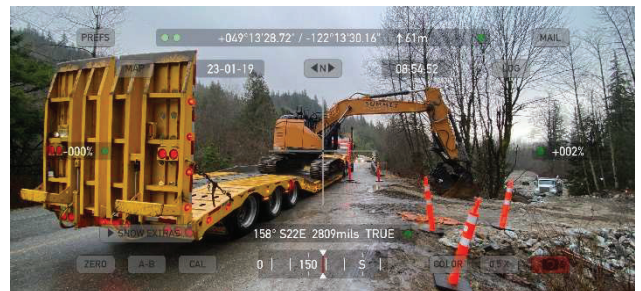


Figure -2
Looking southerly at demob of Case excavator



Figure -3
Looking northerly at start of the drone survey



Figure -4
Looking at 8inch crush material stockpiled



Figure -5
Looking at 1000kg



Figure -6
Looking southerly at infill area south portion

DAILY CONSTRUCTION REPORT



Figure -7
Looking easterly at the infill section midway



Figure -8
Looking northeasterly at the infill area north section



Owner:	Ministry of Environment & Natural Resources (MoE)	Report No.:	20
Project:	Pattison Creek Emergency Works	Page:	1 of 4
Location:	Sylvester Road, Fraser Valley, BC 49°13'27" N, 122°13'29" W	Project No.:	S-CR-28 2022-2632-01
Contractor:	Summit Earthworks	File No.:	
Contract:		Date:	January 20, 2023
Contract No.:		Temperature:	High: +6°C Low: +1°C
Weather:	Mostly cloudy(foggy) in the am to partly sunny skies in the pm		

Labour Force: Summit: Foreman, 2x operators, Labourer, Medix, 2x truckers

Contractor's Equipment:

John Deere 350G excavator
Link Belt 245x4 excavator
Two Portable washrooms
Two Spill Kit

Visitors: Stephenie Charleson- Sartori
Jason Thompson -Leq'a: mel
Jamie DeGroot - Summit Earthworks

1.0 Report:

- Arrived on site: 7:20 AM.
- Summit foreman on site from 7:00 AM.- 5:30PM
- Lorne Semenowich (AE) departed site at 4:25 PM.
- Security on site from tonight 5:30pm to Monday, 7am

1.1 Downstream Extents – Summit Earthworks:

- Excavators started second diversion channel from 0+0120 to 0+070
- Summit prepared an evacuation plan (Tail Gate Meeting at 7:30am) prior to commencing work due to high turbidity upstream on Thursday, January 19th yesterday and extreme safety precautions (on-going monitoring)
- Meeting with Jamie Summit PM on December billing

1.3 Environmental Monitoring

- Stephenie Charleson was on site for Sartori.
- Satori monitors the water quality.

1.4 Archaeology / First Nations

- Jason Thompson was on site for Leq'a: mel.

Project Status:

- Estimated diversion channel / bank restoration works progress = 70%
- Estimated rip rap placement progress = 25%

2.0 Site Photographs



Figure -1
Looking southerly at new diverted creek

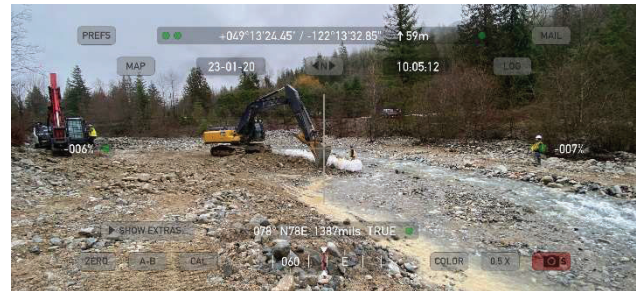


Figure -2
Looking northerly at start of excavation of second diversion at 0+120



Figure -3

Looking northerly at start of the 3;1 SLOPE at sta 0+100

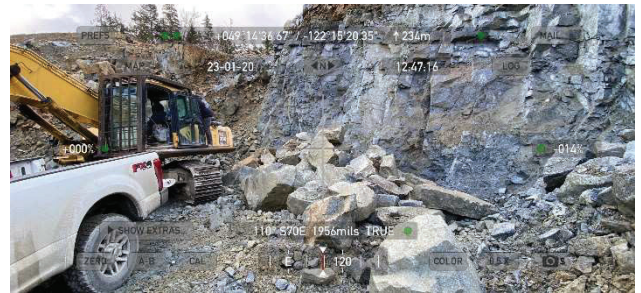


Figure -4

At Stave Lake Quarry- looking at 1000kg rock for delivery next week



Figure -5

Looking northerly into the pit area



Figure -6

Looking northerly at the progress at second diversion channel



Figure -7

Looking southeasterly at the pumping of sediment-water at the excavation

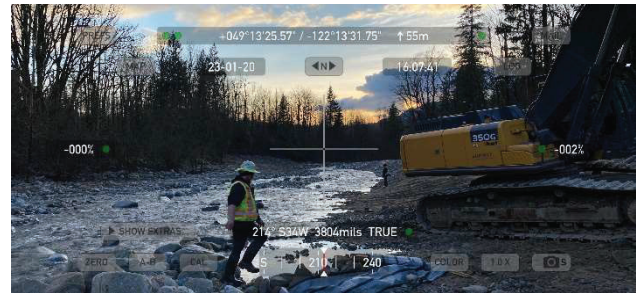


Figure -8

Looking southerly at the end of the day



Owner:	Ministry of Environment & Natural Resources (MoE)	Report No.:	21
Project:	Pattison Creek Emergency Works	Page:	1 of 3
Location:	Sylvester Road, Fraser Valley, BC 49°13'27" N, 122°13'29" W	Project No.:	S-CR-28 2022-2632-01
Contractor:	Summit Earthworks	File No.:	
Contract:		Date:	January 23, 2023
Contract No.:		Temperature:	High: +5°C Low: +2°C
Weather:	Mostly Cloudy(foggy) in the am to partly cloudy in the pm		

Labour Force: Summit: Foreman, 2x operators, Labourer, Medix, 2x truckers

Contractor's Equipment:

John Deere 350G excavator
Link Belt 245x4 excavator
Two Portable washrooms
Two Spill Kit

Visitors: Nate Lui- Sartori
Jason Thompson -Leq'a: mel
Trevor Friedmann- Associated Engineering

1.0 Report:

- Arrived on site: 7:00 AM.
- Summit foreman on site from 7:00 AM.- 4:00PM (crew finished at 4:30pm)
- Lorne Semenowich (AE) departed site at 4:30 PM.
- Security on site from tonight 5:30pm to Tuesday 7am

1.1 Downstream Extents – Summit Earthworks:

- Excavators started second diversion channel from 0+0160 to 0+070
- Summit prepared an evacuation plan (Tail Gate Meeting at 7:30am) prior to commencing work due to high turbidity upstream on Thursday, January 19th yesterday and extreme safety precautions (on-going monitoring)
- Site tour with AE & Summit
- Completed placing 500kg class rock on west bank bend.
- Summit placed 5/50m length of 1000kg class rock on the west bend.
- Summit delivered 8" rock (2 loads) and 1000kg (3 loads) to site by Hi-Tech Excavating and Demolition

1.3 Environmental Monitoring

- Nate Lui was on site for Sartori.
- Satori monitors the water quality.

1.4 Archaeology / First Nations

- Jason Thompson was on site for Leq'a: mel.

Project Status:

- Estimated diversion channel / bank restoration works progress = 75%
- Estimated rip rap placement progress = 30%

2.0 Site Photographs



Figure -1
Looking at monitoring rod- water level



Figure -2
Looking northerly at delivery of 8-inch rock for base works



Figure -3

Looking northerly at mega bags going into place for the new diversion at rip-rap area 0+060



Figure -4

At Stave Lake Quarry- looking at 1000kg rock for delivery next week



Figure -5

Looking westerly at creek bend of 500/1000kg placement on the west bank



Figure -6

Looking southerly at the progress at second diversion channel/west bank riprap



Owner:	Ministry of Environment & Natural Resources (MoE)	Report No.:	22
Project:	Pattison Creek Emergency Works	Page:	1 of 4
Location:	Sylvester Road, Fraser Valley, BC 49°13'27" N, 122°13'29" W	Project No.:	S-CR-28 2022-2632-01
Contractor:	Summit Earthworks	File No.:	
Contract:		Date:	January 24, 2023
Contract No.:		Temperature:	High: +5°C Low: +2°C
Weather:	Light rain in the am to drizzle in the pm		

Labour Force: Summit: Foreman, 2x operators, Labourer, Medix, 2x truckers

Contractor's Equipment:

John Deere 350G excavator
Link Belt 245x4 excavator
Two Portable washrooms
Two Spill Kit

Visitors: Gabby Trainor- Sartori
Jason Thompson -Leq'a: mel
604 Traffic Control crew (2)
Eric Finney of Associated Engineering

1.0 Report:

- Arrived on site: 7:20 AM.
- Summit foreman on site from 7:00 AM.- 5:00PM
- Lorne Semenowich (AE) departed site at 4:30 PM.
- Security on site from tonight 5:30pm to Wednesday 7am

1.1 Downstream Extents – Summit Earthworks:

- Summit prepared an evacuation plan prior to commencing work due to high turbidity upstream on Thursday, January 19th yesterday and extreme safety precautions (on-going monitoring)
- Summit placed 15/50m length of 1000kg class rock on the west bank.
- Summit started placing 10/35m length 500kg class rock adjacent to the bridge.
- Eric Finney/LDS/PM from Summit met to discuss December billing & projected costs.
- Summit met with the quarry on supply of rock as they are increasing to four trucks tomorrow

1.3 Environmental Monitoring

- Gabby Trainor was on site for Sartori.
- Sartori monitors the water quality.

1.4 Archaeology / First Nations

- Jason Thompson was on site for Leq'a: mel.

Project Status:

- Estimated diversion channel / bank restoration works progress = 75%
- Estimated rip rap placement progress = 37%

2.0 Site Photographs

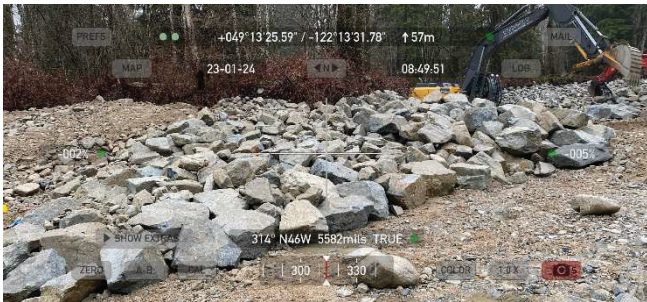


Figure -1

Looking northwesterly at 500kg rock placed at west bank of rip rap bend

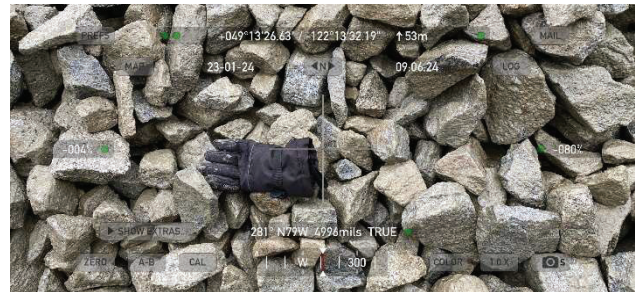


Figure -2

Looking at 8inch rock delivered to site

DAILY CONSTRUCTION REPORT



Figure -3

Looking westerly at the start of placement of 1000kg rock on the west bank



Figure -4

Looking southerly at 1000kg rock on the west bank

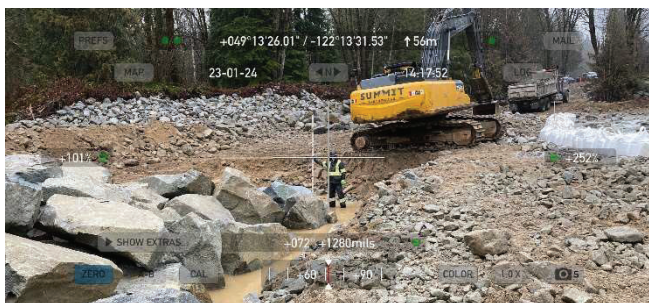


Figure -5

Looking northerly at grading of rock placement



Figure -6

Looking northerly at the delivery of 1000kg rock

DAILY CONSTRUCTION REPORT



Figure -7

Looking westerly at the debris removal at the west bank at 0+000 to 0+025

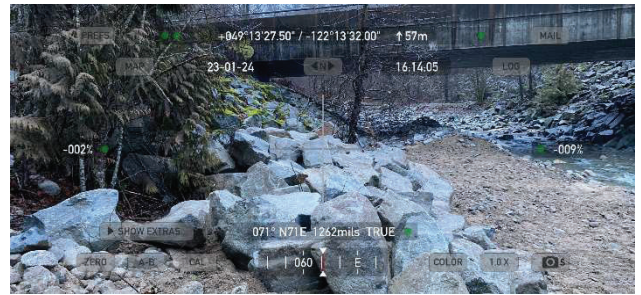


Figure -8

Looking easterly at start of 500kg placement on the northerly section of the west bank



Owner:	Ministry of Environment & Natural Resources (MoE)	Report No.:	23
Project:	Pattison Creek Emergency Works	Page:	1 of 4
Location:	Sylvester Road, Fraser Valley, BC 49°13'27" N, 122°13'29" W	Project No.:	S-CR-28 2022-2632-01
Contractor:	Summit Earthworks	File No.:	
Contract:		Date:	January 25, 2023
Contract No.:		Temperature:	High: +5°C Low: +2°C
Weather:	Overcast skies all day		

Labour Force: Summit: Foreman, 2x operators, Labourer, Medix, 4x truckers (subcontractor)

Contractor's Equipment:

John Deere 350G excavator
Link Belt 245x4 excavator
Two Portable washrooms
Two Spill Kit

Visitors: Stephanie Charleson- Sartori
Jason Thompson -Leq'a: mel
604 Traffic Control crew (2)
Savana Hargrove - Summit

1.0 Report:

- Arrived on site: 7:10 AM.
- Summit foreman on site from 7:00 AM.- 5:00PM
- Lorne Semenowich (AE) departed site at 4:00 PM.
- Security on site from tonight 5:30pm to Thursday 7am

1.1 Downstream Extents – Summit Earthworks:

- Summit prepared an evacuation plan prior to commencing work due to high turbidity upstream on Thursday, January 19th yesterday and extreme safety precautions (on-going monitoring)
- Summit placed 42/50m length of 1000kg class rock on the west bank.
- Summit started placing 15/35m length 500kg class rock adjacent to the bridge.
- Hi-Tech Excavating & Demolition Ltd supplied trucking with 4 tandems
- 30 loads of 1000kg & 4 loads of 8" rock material was delivered to site.

1.3 Environmental Monitoring

- Stephanie Charleson was on site for Sartori.
- Satori monitors the water quality.

1.4 Archaeology / First Nations

- Jason Thompson was on site for Leq'a: mel.

Project Status:

- Estimated diversion channel / bank restoration works progress = 80%
- Estimated rip rap placement progress = 70%

2.0 Site Photographs



Figure -1

Looking northwesterly at 1000kg rock placement at west bank of rip rap

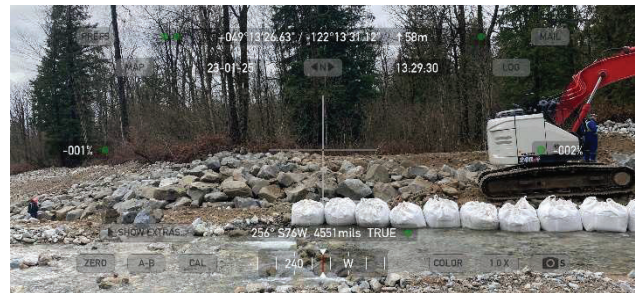


Figure -2

Looking westerly at rip-rap placement at 0+0070

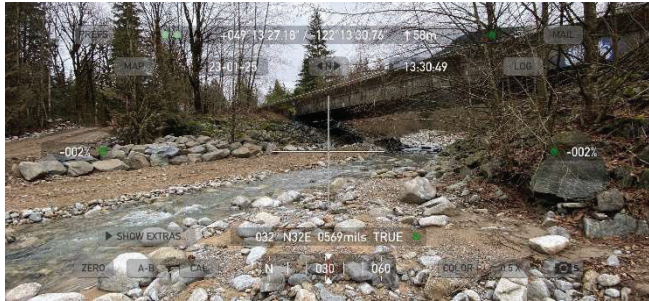


Figure -3

Looking northerly at the start of placement of 500kg rock on the west bank



Figure -4

Looking southerly at 1000kg rock on the west bank

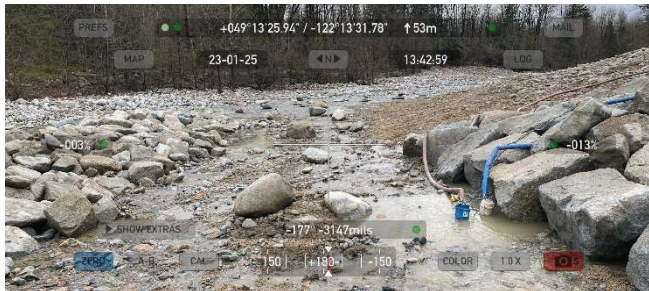


Figure -5

Looking southerly at diversion creek at 0+075



Figure -6

Looking westerly at the start of 500kg rock placement adjacent to the bridge & access road



Figure -7

Looking westerly at the end of the day placement of 1000kg rock at 0+0028



Figure -8

Looking westerly at end of the day placement of 500kg placement on the northerly section of the west bank



Owner:	Ministry of Environment & Natural Resources (MoE)	Report No.:	24
Project:	Pattison Creek Emergency Works	Page:	1 of 4
Location:	Sylvester Road, Fraser Valley, BC 49°13'27" N, 122°13'29" W	Project No.:	S-CR-28 2022-2632-01
Contractor:	Summit Earthworks	File No.:	
Contract:		Date:	January 26, 2023
Contract No.:		Temperature:	High: +5°C Low: +2°C
Weather:	Drizzle all day long		

Labour Force: Summit: Foreman, 2x operators, Labourer, Medix, 2x truckers (subcontractor)

Contractor's Equipment:

John Deere 350G excavator
Link Belt 245x4 excavator
Two Portable washrooms
Two Spill Kit

Visitors: Stephanie Charleson- Sartori
Rick McKamey -Leq'a: mel
Jamie DeGroot - Summit
Savana Hargrove – Summit
Gabby Trainor - Sartori

1.0 Report:

- Arrived on site: 7:15 AM.
- Summit foreman on site from 7:00 AM.- 5:00PM
- Lorne Semenowich (AE) departed site at 4:30 PM.
- Security on site from tonight 5:30pm to Friday 7am

1.1 Downstream Extents – Summit Earthworks:

- Summit prepared an evacuation plan prior to commencing work due to high turbidity upstream on Thursday, January 19th yesterday and extreme safety precautions (on-going monitoring)
- Summit placed 4/50m length of 1000kg class rock on the west bank.
- Summit placed 2/35m length 500kg class rock adjacent to the bridge.
- Hi-Tech Excavating & Demolition Ltd supplied trucking with one tandem truck

1.3 Environmental Monitoring

- Stephanie Charleson was on site for Sartori.
- Sartori monitors the water quality.
- Sartori crew did a fish salvage from 0+075 to 0+0100

1.4 Archaeology / First Nations

- Rick McKamey was on site for Leq'a: mel.

Project Status:

- Estimated diversion channel / bank restoration works progress = 85%
- Estimated rip rap placement progress = 70%

2.0 Site Photographs



Figure -1

Looking southerly at rip-rap placement at sta 0+0030 on the west bank



Figure -2

Looking southerly diversion excavation at 0+0030

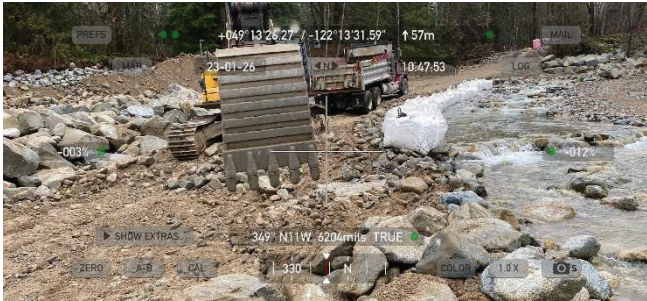


Figure -3

Looking northerly at the start of water opening of the diversion removal at 0+0045 on the west bank



Figure -4

Looking southerly at water flow at 0+075 on the west bank



Figure -5

Looking southerly at normal flow at 0+075 new diversion

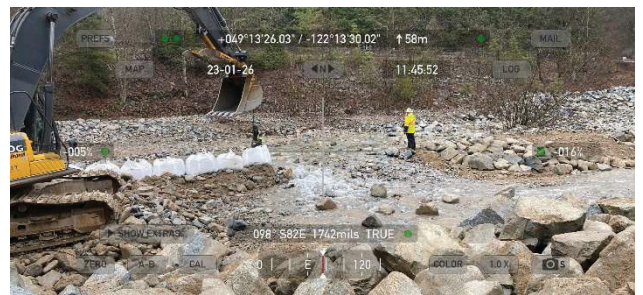


Figure -6

Looking easterly at the mega bag removal



Figure -7

Looking westerly at the mega bag demob from the creek site



Figure -8

Looking westerly at remainder excavation for rip-rap placement on the northerly section of the west bank



Owner:	Ministry of Environment & Natural Resources (MoE)	Report No.:	25
Project:	Pattison Creek Emergency Works	Page:	1 of 4
Location:	Sylvester Road, Fraser Valley, BC 49°13'27" N, 122°13'29" W	Project No.:	S-CR-28 2022-2632-01
Contractor:	Summit Earthworks	File No.:	
Contract:		Date:	January 27, 2023
Contract No.:		Temperature:	High: +7°C Low: +2°C
Weather:	Partly Cloudy skies in the am to cloudy skies to drizzle periods in the pm		

Labour Force: Summit: Foreman, 2x operators, Labourer, Medix, 3x truckers (subcontractor)

Contractor's Equipment:

John Deere 350G excavator
Link Belt 245x4 excavator
Two Portable washrooms
Two Spill Kit

Visitors: Stephanie Charleson- Sartori
Rick McKamey & Tina -Leq'a: mel
Jamie DeGroot - Summit
Gabby Trainor – Sartori
Jeffrey Kim - Sartori

1.0 Report:

- Arrived on site: 7:25 AM.
- Summit foreman on site from 7:00 AM.- 5:00PM
- Lorne Semenowich (AE) departed site at 4:20 PM.
- Security on site from tonight 5:30pm to Monday 7am

1.1 Downstream Extents – Summit Earthworks:

- Summit prepared an evacuation plan prior to commencing work due to high turbidity upstream on Thursday, January 19th yesterday and extreme safety precautions (on-going monitoring)
- Summit placed 45/50m length of 1000kg class rock on the west bank.
- Summit placed 30/35m length 500kg class rock adjacent to the bridge.
- Hi-Tech Excavating & Demolition Ltd supplied trucking with three tandem trucks
- 27 loads of rock delivered -8inch (4 loads), one load of 500kg, and 22 loads of 1000kg rock

1.3 Environmental Monitoring

- Stephanie Charleson was on site for Sartori.
- Sartori monitors the water quality.
- Sartori crew did a fish salvage from 0+075 to 0+0100 (east bank)

1.4 Archaeology / First Nations

- Rick McKamey was on site for Leq'a: mel.

Project Status:

- Estimated diversion channel / bank restoration works progress = 90%
- Estimated rip rap placement progress = 85%

2.0 Site Photographs



Figure -1

Looking southerly at remainder rip-rap placement on the west bank

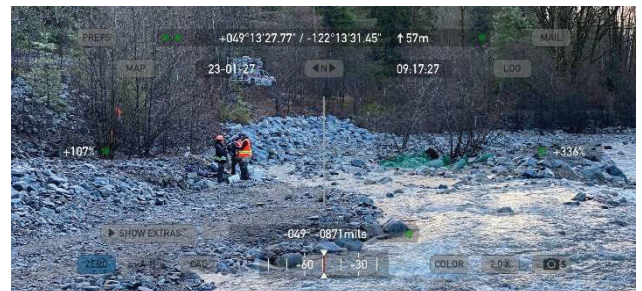


Figure -2

Looking southerly at diversion excavation at 0+0030



Figure -3

Looking northerly at the new opening of the creek diversion



Figure -4

Looking northeasterly at remainder of mega bags removal on the west bank

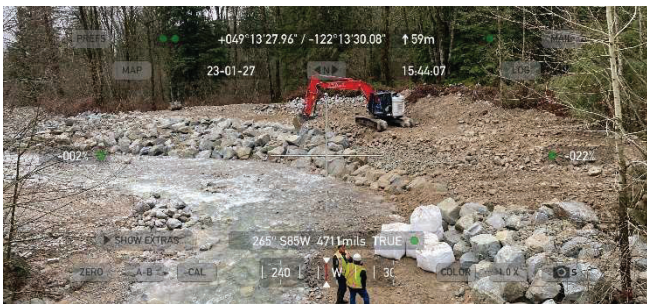


Figure -5

Looking westerly at completion of first row of rip-rap rock placed on the west bank

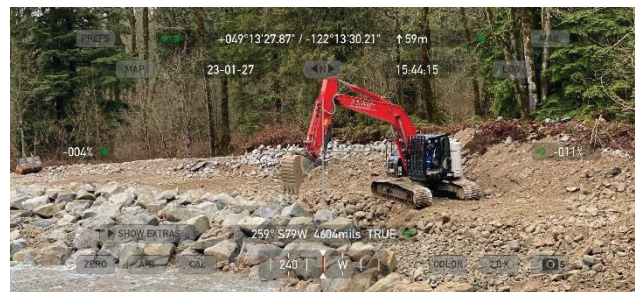


Figure -6

Looking westerly at the 1000kg being placed on the west bank

DAILY CONSTRUCTION REPORT

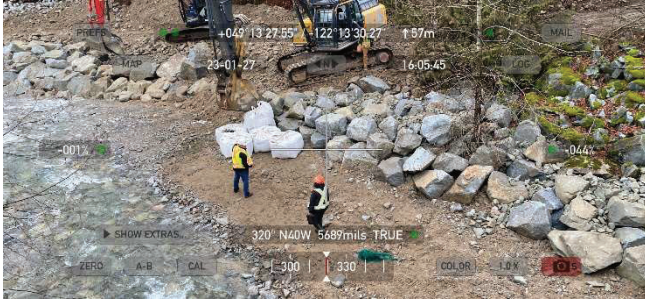


Figure -7

Looking westerly at the cleanup at rip-rap face at 0+0025 on the northwest bank

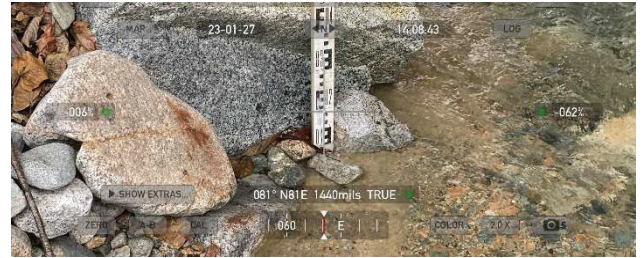


Figure -8

Looking at new location of water level monitoring using a survey rod on the west bank at the bridge



Owner:	Ministry of Environment & Natural Resources (MoE)	Report No.:	26
Project:	Pattison Creek Emergency Works	Page:	1 of 4
Location:	Sylvester Road, Fraser Valley, BC 49°13'27" N, 122°13'29" W	Project No.:	S-CR-28 2022-2632-01
Contractor:	Summit Earthworks	File No.:	
Contract:		Date:	January 30, 2023
Contract No.:		Temperature:	High: -1°C Low: -8°C
Weather:	Clear & cold in the am to Partly Cloudy skies in the pm		

Labour Force: Summit: Foreman, one Operator, Labourer, 3x truckers (subcontractor)

Contractor's Equipment:

John Deere 350G excavator-demob in the am.
Link Belt 245x4 excavator
Two Portable washrooms
Two Spill Kits

Visitors:

Jason Thompson -Leq'a: mel
Jamie DeGroot – Summit
Two TCPs from 604 Traffic Control

Report:

- Arrived on site: 7:30 AM.
- Summit foreman on site from 7:00 AM.- 5:00PM
- Lorne Semenowich (AE) departed site at 3:15 PM.
- Security on site from tonight 5:30pm to Tuesday 7am
- AE held a Team Meeting regarding project Costs and Summit invoicing.

1.1 Downstream Extents – Summit Earthworks:

- Summit prepared an evacuation plan prior to commencing work due to high turbidity upstream on Thursday, January 19th yesterday and extreme safety precautions (on-going monitoring)
- Moderate turbidity in the creek from upstream after 2pm
- Moderate turbidity in the creek on Sunday, January 29th around 4pm observed by Summit.
- Summit placed 50/50m length of 1000kg class rock on the west bank.
- Summit placed 35/35m length 500kg class rock adjacent to the bridge.
- Hi-Tech Excavating & Demolition Ltd supplied trucking with three tandem trucks

1.3 Environmental Monitoring

- No reporting done today as Summit was not close to the creek.
- Observed medium turbidity in upstream after 2pm
- Summit observed medium turbidity in upstream after 4pm & on Sunday afternoon (Jan 29/23)

1.4 Archaeology / First Nations

- Jason Thompson was on site for Leq'a: mel from 9-10am and 1:30-2:30pm

Project Status:

- Estimated diversion channel / bank restoration works progress = 99%
- Estimated rip rap placement progress = 100%
- Summit delivered 18 loads of 500kg and 7 loads of 8inch rock to site.

2.0 Site Photographs



Figure -1

Looking southwesterly at rip-rap placement at on the west bank



Figure -2

Looking westerly at northerly riprap (500kg) on the west bank



Figure -3

Looking southerly at the demob of JD350 excavator



Figure -4

Looking westerly at final rock placements of the 500kg



Figure -5

Looking southwesterly at delivery of lock-blocks to site



Figure -6

Looking easterly at the unloading the lock-blocks

DAILY CONSTRUCTION REPORT



Figure -7
Looking northerly at the road sweeping

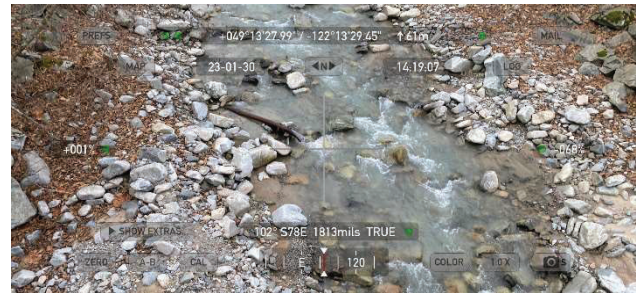


Figure -8
Looking down at upstream medium turbidity at 2:19pm



Owner:	Ministry of Environment & Natural Resources (MoE)	Report No.:	27
Project:	Pattison Creek Emergency Works	Page:	1 of 3
Location:	Sylvester Road, Fraser Valley, BC 49°13'27" N, 122°13'29" W	Project No.:	S-CR-28 2022-2632-01
Contractor:	Summit Earthworks	File No.:	
Contract:		Date:	January 31, 2023
Contract No.:		Temperature:	High: -1°C Low: -4°C
Weather:	Snowy lightly in the am to Cloudy skies in the pm		

Labour Force: Summit: Foreman, one Operator, Labourer, one trucker (subcontractor)

Contractor's Equipment:

Link Belt 245x4 excavator
Two Portable washrooms
Two Spill Kits

Visitors:

Jason Thompson -Leq'a: mel

Report:

- Arrived on site: 8:45 AM.
- Summit foreman on site from 7:00 AM.- 10:00AM
- Lorne Semenowich (AE) departed site at 10:00AM.
- No Security tonight

1.1 Downstream Extents – Summit Earthworks:

- Summit prepared an evacuation plan prior to commencing work due to high turbidity upstream on Thursday, January 19th yesterday and extreme safety precautions (on-going monitoring)
- Summit demob mega bags and creek debris (steel pipe & logging steel cable)
- Hi-Tech Excavating & Demolition Ltd supplied trucking with one end dump

1.3 Environmental Monitoring

- No reporting done today as Summit was not close to the creek.

1.4 Archaeology / First Nations

- Jason Thompson was on site for Leq'a: mel.

Project Status:

- Estimated diversion channel / bank restoration works progress = 99%
- Estimated rip rap placement progress = 100%

2.0 Site Photographs

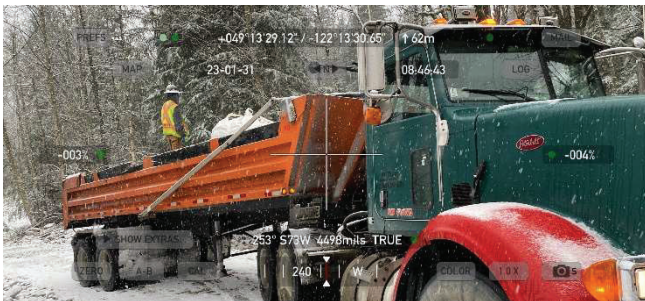


Figure -1

Looking southwesterly at end dump being loaded with mega bags



Figure -2

Looking easterly at loading of the mega bags onto end dump



Figure -3

Looking southerly at the demob of spill kits and misc. equipment

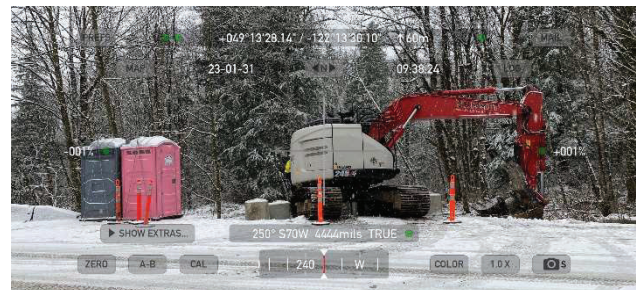


Figure -4

Looking westerly at access road blockade by excavator and lock blocks



Figure -5
Looking southwesterly at creek rip rap covered in snow



Figure -6
Looking easterly at the bridge & creek



Owner:	Ministry of Environment & Natural Resources (MoE)	Report No.:	28
Project:	Pattison Creek Emergency Works	Page:	1 of 3
Location:	Sylvester Road, Fraser Valley, BC 49°13'27" N, 122°13'29" W	Project No.:	S-CR-28 2022-2632-01
Contractor:	Summit Earthworks	File No.:	
Contract:		Date:	February 2, 2023
Contract No.:		Temperature:	High: +7°C Low: +1°C
Weather:	Cloudy skies all day		

Labour Force: Summit: Foreman,

Contractor's Equipment:

Link Belt 245x4 excavator planned demob Feb 3/23
Two Portable washrooms – demob Feb 1/23
Two Spill Kits-demob Jan 31/23

Visitors:

Jason Thompson, Tina Pederson, and Rick McKamey -Leq'a: mel
Ed Jones, Geoff Ratcliffe, Phil Vanlaar, & Jamie DeGroot – Summit Earthworks
Stephanie Charleson-Sartori
Trevor Friedmann & LDS-AE
Vector Geomatics surveyors (2)

Report:

- Arrived on site: 11:30 AM.
- Summit foreman on site from 9:00 AM.- 3:00PM
- Lorne Semenowich (AE) departed site at 2:30AM.
- No Security tonight – batteries removed by Summit.

1.1 Downstream Extents – Summit Earthworks:

- Summit prepared an evacuation plan prior to commencing work due to high turbidity upstream on Thursday, January 19th yesterday and extreme safety precautions (on-going monitoring)
- Site Meeting -Final Walk through with AE/Summit/Leq'a: mel in attendance
- General discussion on construction and deliverables
- Surveyors were on site to do as-builts of the placed riprap and other constructed features.

1.3 Environmental Monitoring

- No reporting done today as construction is completed.

1.4 Archaeology / First Nations

- No reporting done today as construction is completed.

Project Status:

- Estimated diversion channel / bank restoration works progress = 100%
- Estimated rip rap placement progress = 100%

2.0 Site Photographs



Figure -1
Looking southwesterly at creek flow in the am



Figure -2
Looking westerly/down at creek flow



Figure -3
Looking southerly at the GPS base station of Vector Geomatics (doing as-builts with rover)



Figure -4
Looking northerly from station 0+0120 at creek rip-rap on west(left)

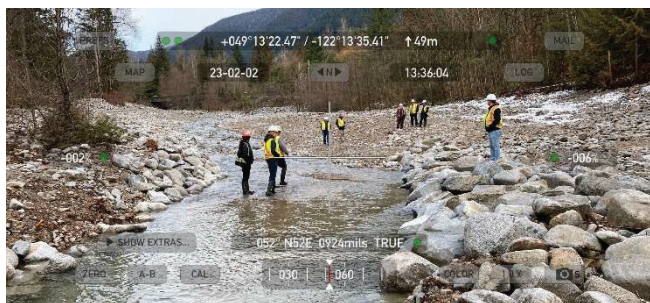


Figure -5
Looking northerly at Site Tour for final walk through
at station 0+0190



Figure -6
Looking northerly at the creek at 0+0160

Appendix N



Weekly Environmental Monitor Inspection Form Pattison Creek Sediment Removal and Bank Protection

Week:	December 11-17, 2022	Environmental Monitor(s):	Stephenie Charleson James Carmichael
Supervising QEP:	Matthew Joyce (R.B.Tech)	Weather conditions:	Clear, light snow
Days on site:	December 14 December 16	Total precipitation (week):	2.8 mm retrieved from: https://vancouver.weatherstats.ca/charts/precipitation-daily.html
		Peak precipitation (24 hr period):	2.1 mm retrieved from: https://vancouver.weatherstats.ca/charts/precipitation-daily.html
Description of Work Activities performed:	December 14 James Carmichael (R.P.Bio) performed an Oregon forestsnail survey and wildlife tree survey for access road route planning. December 16 Access route grubbing.		

Environmental Monitoring Activity	Y/N/NA	Comments
Erosion and Sediment Control		
Were ESC supplies onsite?	N/A	-
Were disturbed areas protected from wind/water erosion?	Y	Clearing area was limited to temporary access roads. Ground is presently frozen, no additional ESC mitigations were deemed necessary by the EM.
Were ESC mitigation measures employed (e.g., for drainage)?	Y	Minimizing ground disturbance. No other mitigations to date.
Were stockpiles secured (covered or surrounded in sediment fence)?	N/A	-
Observations?	N	No other notable observations.
Vegetation/clearing Management		
Was equipment is clean and free of weeds?	Y	Equipment appeared clean and free of vegetative material.
Was invasive plant species handling, and disposal methodology implemented?	N/A	-
Were clearing limits marked in field and Oregon forestsnail and wildlife tree sensitivities delineated?	Y	An SEI QEP attended site and performed surveys for Oregon forest snail to the extent possible and for wildlife trees. The access road clearing perimeter was flagged on December 14 and subsequently cleared on December 16, 2022. No Oregon forestsnails were observed, however, several wildlife trees were present. No wildlife trees were removed during clearing for the access road.
Was site restoration activity implemented?	N/A	-
Were wildlife observations reported?	N	No wildlife was observed or reported to the EM.
Were waste containers for food, fuels, oils, sanitary waste in use?	N	-
Observations?	N	No other notable observations.
Site Isolation and Fish Salvage		
Were instream works were conducted in isolation of streamflow?	N/A	-



Weekly Environmental Monitor Inspection Form
Pattison Creek Sediment Removal and Bank Protection

Were instream works conducted during appropriate flow conditions?	N/A	-
Instream works were preceded by a fish salvage by SEI.	N/A	-
Was fish mortality/injury observed?	N	-
Was the SEI EM present during instream works?	N/A	-
Did induced water quality remain within BC Working Water Quality Guidelines for Aquatic Life.	N/A	-
Observations	N/A	No instream works to date.
Solid Waste Management		
Waste bins labeled?	N/A	-
Were portable toilets >30m from waterbodies?	N/A	-
Housekeeping; was site clean?	Y	The site appeared to be in good, clean condition.
Contaminated Soils Management		
Potentially contaminated soils found?	N	No contaminated soils were observed
Potentially contaminated soils found are stockpiled separately (detected by odour, sheen, buried debris)	N/A	-
Contaminated soils are stockpiled appropriately and tracked for original location	N/A	-
Observations?	N/A	-
Hazardous Materials and Spill Response		
Materials and fuels in 2 ^{ary} containment & protected from weather?	N/A	-
Materials labeled per WHMIS/TDG requirements?	N/A	-
Spill response procedures, spill kit, and fire extinguisher present/accessible?	Y	Spill kit observed on site attached to the machine.
Spill trays in use (small immobile or mobile equipment)?	N/A	-
Refueling procedures followed (no smoking, monitor pumps, automatic shutoffs etc.)?	N/A	Refueling was not observed during the inspection.
Did refueling occur >30m from water?	N/A	-
MSDS available?	N/A	-
Observations	N	No other notable observations.
First Nations/Heritage Resources		
Did the Leq'a:mel First Nation representative identify any environmental concerns?	N	-
Archaeological chance finds reported?	N	No chance finds reported to EM.



Weekly Environmental Monitor Inspection Form

Pattison Creek Sediment Removal and Bank Protection

Photo-documentation



Photo 1. Trees to be felled for site access. SEI performed wildlife tree and Oregon forests nail surveys prior to tree removal (Dec. 14, 2022).



Photo 2. Another view of trees to be felled for site access. SEI performed wildlife tree and Oregon forests nail surveys prior to tree removal (Dec. 14, 2022).



Photo 3. View of wildlife trees to be retained during access road clearing (Dec. 16, 2022).



Photo 4. View of tree clearing for access road clearing (Dec. 16, 2022).

ENVIRONMENTAL ISSUE, NON-CONFORMANCE, INCIDENT AND CORRECTIVE ACTION SUMMARY TABLE

No ongoing environmental issues, non-conformance or incidents were identified. See table below for past issue tracking.

Issue No.	Environmental Issue / Non-Conformance and Location	Date Identified [DD-MON-YY]	Description of Environmental Issue and Corrective Action Plan	Due Date [DD-MON-YY]	Date Completed [DD-MON-YY]
-	-	-	-	-	-



Weekly Environmental Monitor Inspection Form Pattison Creek Sediment Removal and Bank Protection

Week:	December 18-24, 2022	Environmental Monitor(s):	Stephanie Charleson
Supervising QEP:	Matthew Joyce (R.B.Tech)	Weather conditions:	Snow, rain
Days on site:	December 19	Total precipitation (week):	77 mm retrieved from: https://vancouver.weatherstats.ca/charts/precipitation-daily.html
		Peak precipitation (24 hr period):	28.2 mm retrieved from: https://vancouver.weatherstats.ca/charts/precipitation-daily.html
Description of Work Activities performed:	December 19 Access improvements within Pattison Creek floodplain.		

Environmental Monitoring Activity	Y/N/NA	Comments
Erosion and Sediment Control		
Were ESC supplies onsite?	N/A	Limited erosion risk was perceived by the EM; installation of ESC supplies was unnecessary.
Were disturbed areas protected from wind/water erosion?	Y	Clearing area was limited to temporary access roads. Additional ESC mitigations were deemed unnecessary by the EM.
Were ESC mitigation measures employed (e.g., for drainage)?	Y	Minimizing ground disturbance. No other mitigations to date were observed or requested by the EM.
Were stockpiles secured (covered or surrounded in sediment fence)?	N/A	No stockpiling was observed during the reporting period.
Observations?	N	No other notable observations.
Vegetation/clearing Management		
Was equipment is clean and free of weeds?	Y	Equipment appeared clean and free of plant material.
Was invasive plant species handling, and disposal methodology implemented?	N/A	-
Were clearing limits marked in field and Oregon forests/nail and wildlife tree sensitivities delineated?	N/A	No additional clearing occurred.
Was site restoration activity implemented?	N/A	-
Were wildlife observations reported?	N	No wildlife was observed or reported to the EM.
Were waste containers for food, fuels, oils, sanitary waste in use?	N	-
Observations?	N	No other notable observations.
Site Isolation and Fish Salvage		
Were instream works were conducted in isolation of streamflow?	Y	Works within the Pattison Creek floodplain were limited to areas above water level on December 19, 2022.
Were instream works were conducted during appropriate flow conditions?	Y	Instream works within the Pattison Creek floodplain on December 19, 2022. Further works were voluntarily suspended due to precipitation.
Instream works were preceded by a fish salvage by SEI.	N/A	Wetted areas of Pattison Creek were not conducted.
Was fish mortality/injury observed?	N	-



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Was the SEI EM present during instream works?	Y	The EM was present for all works within the Pattison Creek floodplain.
Did induced water quality remain within BC Working Water Quality Guidelines for Aquatic Life.	Y	Sources of induced turbidity were not observed by the EM.
Observations	N	No other notable observations.
Solid Waste Management		
Waste bins labeled?	N/A	-
Were portable toilets >30m from waterbodies?	N/A	-
Housekeeping; was site clean?	Y	The site appeared to be in clean condition.
Contaminated Soils Management		
Potentially contaminated soils found?	N	No contaminated soils were observed.
Potentially contaminated soils found are stockpiled separately (detected by odour, sheen, buried debris)	N/A	-
Contaminated soils are stockpiled appropriately and tracked for original location	N/A	-
Observations?	N/A	-
Hazardous Materials and Spill Response		
Materials and fuels in secondary containment & protected from weather?	N/A	-
Materials labeled per WHMIS/TDG requirements?	N/A	-
Spill response procedures, spill kit, and fire extinguisher present/accessible?	Y	Spill kit observed on site attached to the machine.
Spill trays in use (small immobile or mobile equipment)?	N/A	-
Refueling procedures followed (no smoking, monitor pumps, automatic shutoffs etc.)?	N/A	Refueling was not observed during the inspection.
Did refueling occur >30m from water?	N/A	-
MSDS available?	N/A	-
Observations	N	No other notable observations.
First Nations/Heritage Resources		
Did the Leq'a:mel First Nation representative identify any environmental concerns?	N	-
Archaeological chance finds reported?	N	No chance finds reported to EM.



Weekly Environmental Monitor Inspection Form Pattison Creek Sediment Removal and Bank Protection

Photo-documentation

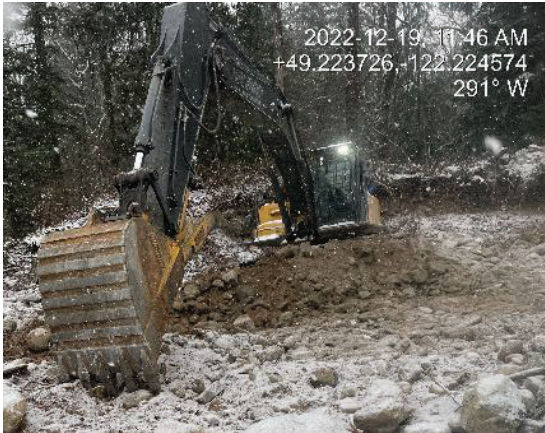


Photo 1. West-facing view of access road excavation above the wetted perimeter of Pattison Creek (Dec. 19, 2022).



Photo 2. South-facing view of grading of the access road, above the wetted perimeter of Pattison Creek (Dec. 19, 2022).



Photo 3. South-facing view of grading within the Pattison Creek floodplain above the wetted perimeter of surface water (Dec. 19, 2022).



Photo 4. Northwest-facing view of site conditions and clear conditions within Pattison Creek (Dec. 19, 2022).

ENVIRONMENTAL ISSUE, NON-CONFORMANCE, INCIDENT AND CORRECTIVE ACTION SUMMARY TABLE

No ongoing environmental issues, non-conformance or incidents were identified. See table below for past issue tracking.

Issue No.	Environmental Issue / Non-Conformance and Location	Date Identified [DD-MON-YY]	Description of Environmental Issue and Corrective Action Plan	Due Date [DD-MON-YY]	Date Completed [DD-MON-YY]
-	-	-	-	-	-



Weekly Environmental Monitor Inspection Form Pattison Creek Sediment Removal and Bank Protection

Week:	December 25 – 31, 2022	Environmental Monitor(s):	(no monitoring performed)
Supervising QEP:	Matthew Joyce (R.B.Tech)	Weather conditions:	mixed
Days on site:	none	Total precipitation (week):	86.3 mm retrieved from: https://vancouver.weatherstats.ca/charts/precipitation-daily.html
		Peak precipitation (24 hr period):	28.8 mm retrieved from: https://vancouver.weatherstats.ca/charts/precipitation-daily.html
Description of Work Activities performed:	No works were conducted by Summit during this reporting period.		

Environmental Monitoring Activity	Y/N/NA	Comments
Erosion and Sediment Control		
Were ESC supplies onsite?	-	-
Were disturbed areas protected from wind/water erosion?	-	No additional ESC mitigations were deemed necessary by the EM.
Were ESC mitigation measures employed (e.g., for drainage)?	-	-
Were stockpiles secured (covered or surrounded in sediment fence)?	-	-
Observations?	-	-
Vegetation/clearing Management		
Was equipment clean and free of weeds?	-	-
Was invasive plant species handling, and disposal methodology implemented?	-	-
Was site restoration activity implemented?	-	-
Were wildlife observations reported?	-	-
Were waste containers for food, fuels, oils, sanitary waste in use?	-	-
Observations?	-	-
Site Isolation and Fish Salvage		
Were instream works were conducted in isolation of streamflow?	-	-
Were instream works were conducted during appropriate flow conditions?	-	-
Instream works were preceded by a fish salvage by SEI.	-	-
Was fish mortality/injury observed?	-	-
Was the SEI EM present during instream works?	-	-
Did induced water quality remain within BC Working Water Quality Guidelines for Aquatic Life.	-	-



Weekly Environmental Monitor Inspection Form
Pattison Creek Sediment Removal and Bank Protection

Observations	-	-
Solid Waste Management		
Waste bins labeled?	-	-
Were portable toilets >30m from waterbodies?	-	-
Housekeeping; was site clean?	-	-
Contaminated Soils Management		
Potentially contaminated soils found?	-	-
Potentially contaminated soils found are stockpiled separately (detected by odour, sheen, buried debris)	-	-
Contaminated soils are stockpiled appropriately and tracked for original location	-	-
Observations?	-	-
Hazardous Materials and Spill Response		
Materials and fuels in 2 ^{ary} containment & protected from weather?	-	-
Materials labeled per WHMIS/TDG requirements?	-	-
Spill response procedures, spill kit, and fire extinguisher present/accessible?	-	-
Spill trays in use (small immobile or mobile equipment)?	-	-
Refueling procedures followed (no smoking, monitor pumps, automatic shutoffs etc.)?	-	-
Did refueling occur >30m from water?	-	-
MSDS available?	-	-
Observations	-	-
First Nations/Heritage Resources		
Did the Leq'a:mel First Nation representative identify any environmental concerns?	N	-
Archaeological chance finds reported?	-	-



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Weekly Environmental Monitor Inspection Form Pattison Creek Sediment Removal and Bank Protection

Photo-documentation

No photos were taking during this monitoring period as no works were conducted.



ENVIRONMENTAL ISSUE, NON-CONFORMANCE, INCIDENT AND CORRECTIVE ACTION SUMMARY TABLE

[illegible]

No ongoing environmental issues, non-conformance or incidents were identified. See table below for past issue tracking.

Issue No.	Environmental Issue / Non-Conformance and Location	Date Identified [DD-MON-YY]	Description of Environmental Issue and Corrective Action Plan	Due Date [DD-MON-YY]	Date Completed [DD-MON-YY]
-	-	-	-	-	-



Weekly Environmental Monitor Inspection Form Pattison Creek Sediment Removal and Bank Protection

Week:	January 1 – 7, 2023	Environmental Monitor(s):	Stephanie Charleson
Supervising QEP:	Matthew Joyce (R.B.Tech)	Weather conditions:	rain
Days on site:	January 3, 2023 January 5, 2023 January 6, 2023	Total precipitation (week):	18.4 mm retrieved from: https://vancouver.weatherstats.ca/charts/precipitation-daily.html
		Peak precipitation (24 hr period):	10.2 mm retrieved from: https://vancouver.weatherstats.ca/charts/precipitation-daily.html
Description of Work Activities performed:	January 3 Assessment of proposed creek crossing for access to do embankment stabilizing. January 5 Creek crossing for embankment stabilizing, excavating and grading access trail & riprap staging. January 6 Water crossing and embankment stabilizing, riprap placement.		

Environmental Monitoring Activity	Y/N/NA	Comments
Erosion and Sediment Control		
Were ESC supplies onsite?	Y	-
Were disturbed areas protected from wind/water erosion?	Y	Riprap placement for embankment stabilizing. Water crossings were monitored by the EM for turbidity readings.
Were ESC mitigation measures employed (e.g., for drainage)?	Y	Minimizing ground disturbance.
Were stockpiles secured (covered or surrounded in sediment fence)?	Y	Woody debris piled to be removed. Riprap and materials were sorted.
Observations?	N	No other notable observations.
Vegetation/clearing Management		
Was equipment is clean and free of weeds?	Y	Equipment appeared clean and free of vegetative material.
Was invasive plant species handling, and disposal methodology implemented?	N/A	-
Was site restoration activity implemented?	N/A	-
Were wildlife observations reported?	N	No wildlife was observed or reported to the EM.
Were waste containers for food, fuels, oils, sanitary waste in use?	N	-
Observations?	N	No other notable observations.
Site Isolation and Fish Salvage		
Were instream works were conducted in isolation of streamflow?	N	Water quality was measured while works were in progress.
Were instream works were conducted during appropriate flow conditions?	Y	Water flow levels were normal.
Instream works were preceded by a fish salvage by SEI.	N/A	-



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Was fish mortality/injury observed?	N	-
Was the SEI EM present during instream works?	Y	Water quality was measured while works proceeded.
Did induced water quality remain within BC Working Water Quality Guidelines for Aquatic Life.	Y	EM worked with the excavator operator and WQ was monitored.
Observations	Y	Turbidity decreased rapidly following instream disturbances.
Solid Waste Management		
Waste bins labeled?	N/A	-
Were portable toilets >30m from waterbodies?	Y	-
Housekeeping; was site clean?	Y	The site appeared to be in good, clean condition.
Contaminated Soils Management		
Potentially contaminated soils found?	N	No contaminated soils were observed
Potentially contaminated soils found are stockpiled separately (detected by odour, sheen, buried debris)	N/A	-
Contaminated soils are stockpiled appropriately and tracked for original location	N/A	-
Observations?	N/A	-
Hazardous Materials and Spill Response		
Materials and fuels in 2 nd containment & protected from weather?	Y	-
Materials labeled per WHMIS/TDG requirements?	Y	-
Spill response procedures, spill kit, and fire extinguisher present/accessible?	Y	Spill kit observed on site attached to the machine.
Spill trays in use (small immobile or mobile equipment)?	Y	Placed under machines when not in use.
Refueling procedures followed (no smoking, monitor pumps, automatic shutoffs etc.)?	Y	Refueling was not observed during the inspection.
Did refueling occur >30m from water?	Y	-
MSDS available?	N/A	-
Observations	N	No other notable observations.
First Nations/Heritage Resources		
Did the Leq'a:mel First Nation representative identify any environmental concerns?	N	-
Archaeological chance finds reported?	N	No chance finds reported to EM.



Weekly Environmental Monitor Inspection Form
Pattison Creek Sediment Removal and Bank Protection

PHOTODOCUMENTATION



Photo 1. Stream conditions prior to works (Jan. 05, 2023).



Photo 2. Equipment staged above high-water mark (Jan. 03, 2023).



Photo 3. Creek crossing for grading and starting embankment stabilization works. (Jan. 5, 2023).



Photo 4. Grading and start of embankment stabilization. (Jan. 5, 2023).



Photo 5. Creek crossing to access embankment stabilization works (Jan 6, 2023).



Photo 6. rock placement to minimize sediment upheaval for stream crossing (Jan 06, 2023).



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Pattison Creek Sediment Removal and Bank Protection

Weekly Environmental Monitor Inspection Form

Pattison Creek Sediment Removal and Bank Protection

Table 1. IN SITU WATER QUALITY MONITORING RESULTS			
Date [DD-MON-YY]	Time (24:00hr)	Turbidity (NTU)	Observations
05-Jan-23	7:41am	2.68	Prior to works.
05-Jan-23	8:18am	3.99	Instream rock placement for stream crossing.
05-Jan-23	8:29am	21.00	
05-Jan-23	9:29am	2.04	
05-Jan-23	10:45am	3.38	Crew took a break at 11:25am.
05-Jan-23	12:26pm	30.44	Linkbelt 245 excavator crosses.
06-Jan-23	7:30am	2.63	2 excavators crossing creek today
06-Jan-23	8:09am	17.35	Deere 350 excavator places rock for crossing.
06-Jan-23	8:31am	39.16	
06-Jan-23	9:26am	23.47	
06-Jan-23	10:06am	21.32	
06-Jan-23	11:15am	17.55	Excavator crossed after cleaning tracks.
06-Jan-23	12:22pm	17.73	
06-Jan-23	1:31pm	0.49	
06-Jan-23	1:58pm	1.27	
06-Jan-23	2:19pm	0.78	
06-Jan-23	2:30pm	12.09	
06-Jan-23	3:04pm	5.12	
06-Jan-23	3:21pm	40.59	
06-Jan-23	3:30pm	21.84	Excavator clears tracks from area.
06-Jan-23	3:41pm	19.54	
06-Jan-23	3:51pm	9.39	Excavator is manipulating rocks instream.
06-Jan-23	4:01pm	37.51	
06-Jan-23	4:05pm	42.86	
06-Jan-23	4:06pm	23.58	Excavating is done for the day.
06-Jan-23		16.62	
06-Jan-23		10.44	
06-Jan-23	4:11pm	0.59	Leave site.

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Pattison Creek Sediment Removal and Bank Protection

TABLE 2. ENVIRONMENTAL ISSUE, NON-CONFORMANCE, INCIDENT AND CORRECTIVE ACTION SUMMARY TABLE

No ongoing environmental issues, non-conformance or incidents were identified. See table below for past issue tracking.

Issue No.	Environmental Issue / Non-Conformance and Location	Date Identified [DD-MON-YY]	Description of Environmental Issue and Corrective Action Plan	Due Date [DD-MON-YY]	Date Completed [DD-MON-YY]
-	-	-	-	-	-



Weekly Environmental Monitor Inspection Form Pattison Creek Sediment Removal and Bank Protection

Week:	January 8 - 14, 2023	Environmental Monitor(s):	Stephanie Charleson
Supervising QEP:	Matthew Joyce (R.B.Tech)	Weather conditions:	Rain, variable
Days on site:	January 9, 2023 January 10, 2023 January 11, 2023 January 12, 2023 January 13, 2023	Total precipitation (week):	38.4 mm retrieved from: https://vancouver.weatherstats.ca/charts/precipitation-daily.html
		Peak precipitation (24 hr period):	18.3 mm retrieved from: https://vancouver.weatherstats.ca/charts/precipitation-daily.html
Description of Work Activities performed:	January 9 Creek diversion channel: grading, clearing, tree removal, embankment stabilization. Water quality monitored. January 10 Meeting about the extension approval details and plans. Woody debris hauled off site. Tree removal for widening creek diversion channel extension. West embankment stabilization. 26 gravel bags delivered onsite. January 11 13 large-format gravel bags set up in creek for creek diversion. Team meeting about extension approval details and plans. Tree and woody debris removal. January 12 Site shut down. January 13 Excavating the creek diversion channel. Install the seclusion fish fencing, remove because of high heavy water flow.		

Environmental Monitoring Activity	Y/N/NA	Comments
Erosion and Sediment Control		
Were ESC supplies onsite?	Y	-
Were disturbed areas protected from wind/water erosion?	Y	Excavating creek diversion channel, water quality was monitored.
Were ESC mitigation measures employed (e.g., for drainage)?	Y	2-inch hose pumping onsite to mitigate sediment from causing high turbidity in creek.
Were stockpiles secured (covered or surrounded in sediment fence)?	Y	Boulders and materials were sorted.
Observations?	N	No other notable observations.
Vegetation/clearing Management		
Was equipment is clean and free of weeds?	Y	Equipment appeared clean and free of vegetative material.
Was invasive plant species handling, and disposal methodology implemented?	N/A	-
Was site restoration activity implemented?	N/A	-
Were wildlife observations reported?	N	No wildlife was observed or reported to the EM.
Were waste containers for food, fuels, oils, sanitary waste in use?	N	-
Observations?	N	No other notable observations.



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Site Isolation and Fish Salvage		
Were instream works were conducted in isolation of streamflow?	N	Water quality was monitored while works were in progress.
Were instream works were conducted during appropriate flow conditions?	Y	Water flow levels increased during periods of the week. Works were voluntarily suspended by Summit when water levels increased beyond a manageable stage to limit erosion and sediment control issues.
Instream works were preceded by a fish salvage by SEI.	N/A	-
Was fish mortality/injury observed?	N	-
Was the SEI EM present during instream works?	Y	Water quality was monitored while works proceeded.
Did induced water quality remain within BC Working Water Quality Guidelines for Aquatic Life.	Y	Brief periods of elevated turbidity were observed during heavy precipitation, however, these were likely attributable to rapidly-changing background conditions. Induced turbidity was appropriately-controlled.
Observations	Y	Background water quality conditions changed rapidly; while the source of sediment is unknown, the source of this background change was from upstream and outside of the active site perimeter.
Solid Waste Management		
Waste bins labeled?	N/A	-
Were portable toilets >30m from waterbodies?	Y	-
Housekeeping; was site clean?	Y	The site appeared to be in good, clean condition.
Contaminated Soils Management		
Potentially contaminated soils found?	N	No contaminated soils were observed
Potentially contaminated soils found are stockpiled separately (detected by odour, sheen, buried debris)	N/A	-
Contaminated soils are stockpiled appropriately and tracked for original location	N/A	-
Observations?	N/A	-
Hazardous Materials and Spill Response		
Materials and fuels in 2 nd containment & protected from weather?	Y	-
Materials labeled per WHMIS/TDG requirements?	Y	-
Spill response procedures, spill kit, and fire extinguisher present/accessible?	Y	Spill kit (x2) observed on site by muster area. Each machine spill kits inside.
Spill trays in use (small immobile or mobile equipment)?	Y	Placed under machines when not in use.
Refueling procedures followed (no smoking, monitor pumps, automatic shutoffs etc.)?	Y	Refueling was observed with spill cloth to capture any drip.
Did refueling occur >30m from water?	Y	-
MSDS available?	N/A	-
Observations	N	No other notable observations.
First Nations/Heritage Resources		

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Did the Leq'a:mel First Nation representative identify any environmental concerns?	N	-
Archaeological chance finds reported?	N	No chance finds reported to EM.



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PHOTODOCUMENTATION

Photo 1. Prior to tree removal for creek diversion channel widening (Jan. 09, 2023).



Photo 2. Tree removal for widening the creek diversion channel (Jan. 09, 2023).



Photo 3. Tree and woody debris removal, widening diversion creek extension (Jan 9, 2023).



Photo 4. West eroded embankment stabilizing with boulders (Jan 09, 2023).



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PHOTODOCUMENTATION



Photo 5. West bank stabilization (Jan 10, 2023).



Photo 6. 26 gravel bags were delivered onsite (Jan. 10, 2023).



Photo 7. 13 large format gravel bags prepped for creek diversion (Jan 11, 2023).



Photo 8. Tree removal to widen creek diversion channel and use material for East bank stabilization (Jan 11, 2023).



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Pattison Creek Sediment Removal and Bank Protection



Photo 9. Pattison Creek level on the morning of January 13, prior to instream works (Jan 13, 2023).



Photo 10. Downstream facing view of the deflection berm gravel bags in river-right margins of Pattison creek (Jan. 13, 2023).



Photo 11. Install fish fencing in creek upstream of the works. The fence was removed after flows increased (Jan 13, 2023).



Photo 12. Pic of the excavation for the creek diversion channel. Turbid water was allowed to settle and has not yet been released from containment (Jan 13, 2023).



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Pattison Creek Sediment Removal and Bank Protection

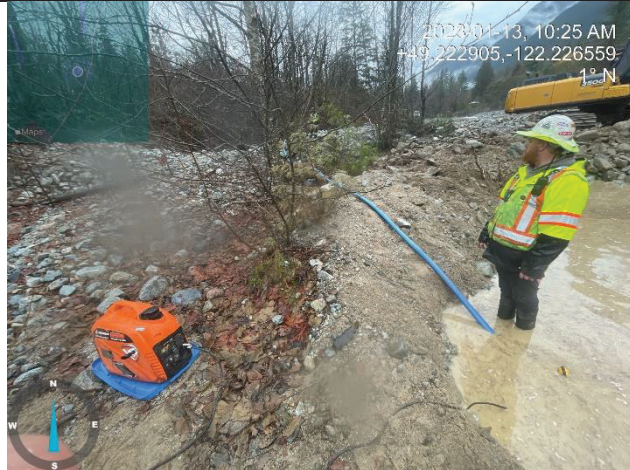


Photo 13. Turbid water was pumped to ground away from Pattison Creek for infiltration (Jan 13, 2023).



Photo 14. Outlet of the of the 2 inch hose; turbid water was pumped to ground away from Pattison Creek for infiltration (Jan. 13, 2023).



Photo 16. Elevated background turbidity at the upstream extent of the site. SEI notes that the origin of the observed turbidity was from outside of site (Jan 13, 2023).



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Photo 17. Turbid water within the excavated diversion channel was contained and left to settle over the weekend. (Jan 13, 2023).

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Pattison Creek Sediment Removal and Bank Protection

Table 1. IN SITU WATER QUALITY MONITORING RESULTS			
Date [DD-MON-YY]	Time (24:00hr)	Turbidity (NTU)	Observations
January 09, 2023			
09-Jan-23	7:48am	2.19	Downstream; prior to works.
09-Jan-23	9:04am	1.18	Downstream; during removal of woody debris at head of dry creek diversion channel.
09-Jan-23	10:18am	33.96	Downstream; excavator removes trees from streambank.
09-Jan-23	10:22am	4.36	
09-Jan-23	10:24am	8.45	
09-Jan-23	10:28am	5.99	
09-Jan-23	10:34am	2.49	
09-Jan-23	10:35am	29.12	Downstream; excavator removes buried tarp from stream margins.
09-Jan-23	10:36am	65.0	
09-Jan-23	10:39am	17.02	
09-Jan-23	10:40am	8.99	
09-Jan-23	10:58am	0.35	Downstream; crew break for lunch break 11:30am.
09-Jan-23	12:13pm	0.25	Downstream; excavator starts works. Removes alder trees and imbedded woody debris on streambank.
09-Jan-23	12:14pm	118	Downstream; excavator starts works. Removes alder trees and imbedded woody debris on streambank.
09-Jan-23	12:16pm	35.70	Downstream; excavator places woody debris in rock truck.
09-Jan-23	12:17pm	33.26	
09-Jan-23	12:18pm	18.33	Downstream; excavator pulls woody debris tree and stump from streambank.
09-Jan-23	12:22pm	16.70	
09-Jan-23	12:24pm	11.74	Downstream; excavator continues to remove alder trees.



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09-Jan-23	12:27pm	9.55	
09-Jan-23	12:30pm	2.93	
09-Jan-23	12:31pm	33.37	
09-Jan-23	12:33pm	10.58	Downstream; Removal of more imbedded woody debris from across the stream.
09-Jan-23	12:37pm	5.48	
09-Jan-23	12:47pm	53	
09-Jan-23	12:48pm	86	Downstream; excavator piles woody debris giving the creek a rest.
09-Jan-23	12:50pm	16.83	
09-Jan-23	12:52pm	22.74	
09-Jan-23	12:54pm	9.85	Downstream; excavator moves to another work area.
09-Jan-23	1:20pm	3.20	
09-Jan-23	3:06pm	0.33	Downstream; work in complete for the day.
January 10, 2023			
10-Jan-23	9:19am	0.16	Downstream; before works.
10-Jan-23	10:57am	0.12	Downstream; grading in dry creek diversion channel.
10-Jan-23	10:28am	5.99	Downstream; end of instream works.
January 11, 2023			
11-Jan-23	7:50am	0.55	Downstream; before works.
11-Jan-23	8:27am	18.42	Downstream; excavator removes boulders from creek to place bags in along Creekside.
11-Jan-23	8:30am	41.13	
11-Jan-23	8:32am	40.26	
11-Jan-23	8:33am	53	Downstream; done excavation.
11-Jan-23	8:35am	24.46	
11-Jan-23	8:36am	17.90	
11-Jan-23	9:05am	4.49	Downstream; excavator starts placing bags in creek.
11-Jan-23	9:06am	9.36	
11-Jan-23	9:08am	3.01	
11-Jan-23	9:11am	4.98	Downstream; continues placing bags, not causing much or any turbidity.



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Pattison Creek Sediment Removal and Bank Protection

11-Jan-23	12:23pm	0.33	Downstream; east side of dry creek diversion channel during tree removal.
11-Jan-23	12:34pm	0.00	
11-Jan-23	12:45pm	0.00	
11-Jan-23	1:11pm	0.36	
11-Jan-23	1:31pm	0.00	
11-Jan-23	1:44pm	0.00	Downstream, excavator is breaking down the removed trees and loading into rock truck.
January 12, 2023			
12-Jan-23	N/A	N/A	No works were performed.
January 13, 2023			
13-Jan-23	8:34am	8.4	Downstream; before works.
13-Jan-23	8:34am	8.4	Downstream; before works.
13-Jan-23	8:54am	17.75	Downstream; work has started.
13-Jan-23	1:26pm	56	Upstream of influences of construction indicating background turbidity has become elevated.
13-Jan-23	1:36pm	109	Downstream; during instream works. Note elevated background turbidity.
13-Jan-23	2:14pm	18.78	Upstream of influences of construction indicating background turbidity has become elevated.
13-Jan-23	2:34pm	33.46	Downstream; during instream works. Note elevated background turbidity.
13-Jan-23	3:08pm	30.64	Downstream; during instream works. Note elevated background turbidity.
13-Jan-23	3:40pm	18.67	Downstream.
13-Jan-23	4:10pm	25	Downstream.
13-Jan-23	4:24pm	10.9	Upstream of influences of construction indicating background turbidity has diminished.

Weekly Environmental Monitor Inspection Form

Pattison Creek Sediment Removal and Bank Protection

TABLE 2. ENVIRONMENTAL ISSUE, NON-CONFORMANCE, INCIDENT AND CORRECTIVE ACTION SUMMARY TABLE

No ongoing environmental issues, non-conformance or incidents were identified. See table below for past issue tracking.

Issue No.	Environmental Issue / Non-Conformance and Location	Date Identified [DD-MON-YY]	Description of Environmental Issue and Corrective Action Plan	Due Date [DD-MON-YY]	Date Completed [DD-MON-YY]
-	-	-	-	-	-



Weekly Environmental Monitor Inspection Form Pattison Creek Sediment Removal and Bank Protection

Week:	January 15 - 21, 2023	Environmental Monitor(s):	Stephenie Charleson
Supervising QEP:	Matthew Joyce (R.B.Tech)	Weather conditions:	rain
Days on site:	January 16, 2023 January 17, 2023 January 18, 2023 January 19, 2023 January 20, 2023	Total precipitation (week):	52.9 mm retrieved from: https://vancouver.weatherstats.ca/charts/precipitation-daily.html
		Peak precipitation (24 hr period):	21.2 mm retrieved from: https://vancouver.weatherstats.ca/charts/precipitation-daily.html
Description of Work Activities performed:	January 16 Creek diversion. Summit excavated the diversion channel. Sartori Environmental installed fish exclusion fencing in the creek above works area to isolate the work area. Sartori Environmental performed a fish salvage in creek channel. Summit diverted 75% of the creek to the diversion channel, leaving 25% still remaining in the historic creek channel. January 17 Summit completed diversion (remaining 25%) and moved piles of riprap to prepare for crossing next day. January 18 Back filling in the historic channel with native bedload material. Summit used a 2 inch pump to divert sediment-laden flow accumulated in old creek channel. Summit voluntarily suspended the works due to a perceived land slide event upstream and outside of the project extents. January 19 Back filling creek channel continued streambank contouring. Riprap delivered onsite. Instream works involved grading stream banks, sediment removal from the stream bank and placing gravel bags for works the next day. January 20 Excavating upper extent of the diversion channel beside the gravel bags berm.		

Environmental Monitoring Activity	Y/N/NA	Comments
Erosion and Sediment Control		
Were ESC supplies onsite?	Y	Pumps and hoses were on site as necessary.
Were disturbed areas protected from wind/water erosion?	Y	Pattison Creek was diverted slowly, under supervision of the EM, in order to avoid undue erosion.
Were ESC mitigation measures employed (e.g., for drainage)?	Y	Sediment laden water from the diversion channel was pumped to vegetation to prevent release to Pattison Creek.
Were stockpiles secured (covered or surrounded in sediment fence)?	Y	Boulders and material stockpiles were not observed to release sediment.
Observations?	N	No other notable observations.
Vegetation/clearing Management		
Was equipment clean and free of weeds?	Y	Equipment appeared clean and free of vegetation material.
Was invasive plant species handling, and disposal methodology implemented?	N/A	-
Was site restoration activity implemented?	N/A	-
Were wildlife observations reported?	N	No wildlife was observed or reported to the EM.



Weekly Environmental Monitor Inspection Form Pattison Creek Sediment Removal and Bank Protection

Were waste containers for food, fuels, oils, sanitary waste in use?	N	-
Observations?	N	No other notable observations.
Site Isolation and Fish Salvage		
Were instream works were conducted in isolation of streamflow?	N	Water quality was monitored while works were in progress.
Were instream works were conducted during appropriate flow conditions?	Y	Water flow levels were medium to high. Summit discussed water level and appropriate mitigations with the EM to suitably mitigate against the undue release of sediment and maintain bank stability during moderate-high flows.
Instream works were preceded by a fish salvage by SEI.	Y	Sartori and Leq'a:mel First Nation representatives salvaged fish during the diversion to avoid prohibited death of fish by stranding.
Was fish mortality/injury observed?	N	A single (1) sculpin mortality were observed during the fish salvage.
Was the SEI EM present during instream works?	Y	Water quality was during the works.
Did induced water quality remain within BC Working Water Quality Guidelines for Aquatic Life.	Y	EM worked with the excavator operator to establish an appropriate pace and WQ was monitored.
Observations	N	-
Solid Waste Management		
Waste bins labeled?	N/A	-
Were portable toilets >30m from waterbodies?	Y	-
Housekeeping; was site clean?	Y	The site appeared to be in good, clean condition.
Contaminated Soils Management		
Potentially contaminated soils found?	N	No contaminated soils were observed
Potentially contaminated soils found are stockpiled separately (detected by odour, sheen, buried debris)	N/A	-
Contaminated soils are stockpiled appropriately and tracked for original location	N/A	-
Observations?	N/A	-
Hazardous Materials and Spill Response		
Materials and fuels in secondary containment & protected from weather?	Y	-
Materials labeled per WHMIS/TDG requirements?	Y	-
Spill response procedures, spill kit, and fire extinguisher present/accessible?	Y	Spill kit (x2) observed on site by muster area. Each machine spill kits inside.
Spill trays in use (small immobile or mobile equipment)?	Y	Spill trays placed under machines when not in use.
Refueling procedures followed (no smoking, monitor pumps, automatic shutoffs etc.)?	Y	Refueling was observed with spill cloth to capture any drip.
Did refueling occur >30m from water?	Y	-
MSDS available?	N/A	-



Weekly Environmental Monitor Inspection Form

Pattison Creek Sediment Removal and Bank Protection

Observations	N	No other notable observations.
First Nations/Heritage Resources		
Did the Leq'a:mel First Nation representative identify any environmental concerns?	N	-
Archaeological chance finds reported?	N	No chance finds reported to EM.
PHOTODOCUMENTATION		
2023-01-16, 8:12 AM +49.223043, -122.226586 71° N	2023-01-16, 8:58 AM +49.223540, -122.225683 72° SE	
Photo 1. Prior to the works. Sediment in the diversion creek channel has settled (Jan. 16, 2023).	Photo 2. Fish exclusion fencing set upstream of the works (Jan. 16, 2023).	
2023-01-16, 9:26 AM +49.222887, -122.226732 74° E	2023-01-16, 9:45 AM +49.222932, -122.226446 287° W	
Photo 3. Opening the end of the diversion channel to initiate diversion (Jan 16, 2023).	Photo 4. Armouring the end of the new diversion channel bank with creek boulders (Jan 16, 2023).	



Weekly Environmental Monitor Inspection Form
Pattison Creek Sediment Removal and Bank Protection

PHOTODOCUMENTATION



Photo 7. Flow within the diversion channel, slowly removing deflection berm gravel bags by end of the day (Jan 16, 2023).



Photo 8. 75% of available flow diverted to the diversion channel (Jan 17, 2023)



Photo 9. Excacator crossing to work on backfilling the old creek channel and bank stabilizing on the East side (Jan 18, 2023).



Photo 10. Old creek channel back filling after all electrofishing has been finished and salvage complete (Jan. 18, 2023).



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Weekly Environmental Monitor Inspection Form Pattison Creek Sediment Removal and Bank Protection

PHOTODOCUMENTATION



Photo 11. Backfilling at the head of the old creek channel (Jan 18, 2023).



Photo 12. Backfilling for bank stabilization in the East side old creek channel (Jan 18, 2023).

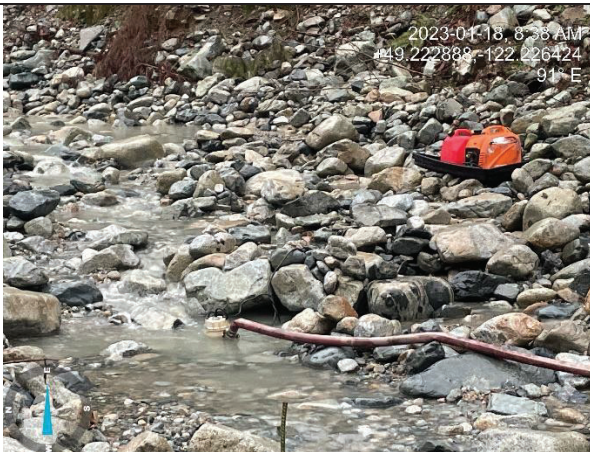


Photo 13. Pumping turbid old creek channel flow (Jan 18, 2023).

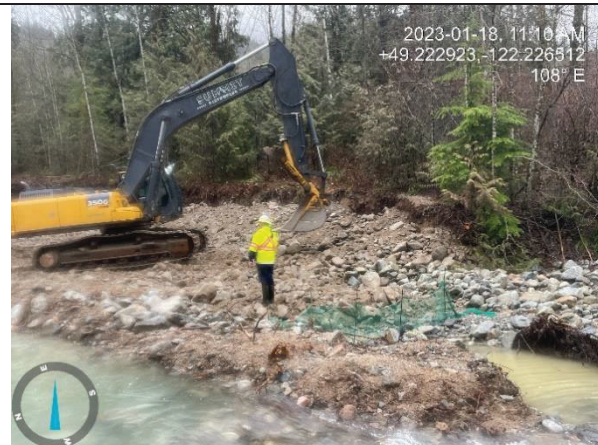


Photo 14. Fish seclusion fencing to be removed after the backfilling and bank stabilization completed on the East side (Jan. 18, 2023).



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Pattison Creek Sediment Removal and Bank Protection



Photo 15. Grading of streambanks outside of the wetted stream perimeter and armoring with coarse material. Note that background flows were elevated, however, the EM observed the origin of the sediment to be upstream of the site (Jan. 18, 2023).



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Pattison Creek Sediment Removal and Bank Protection

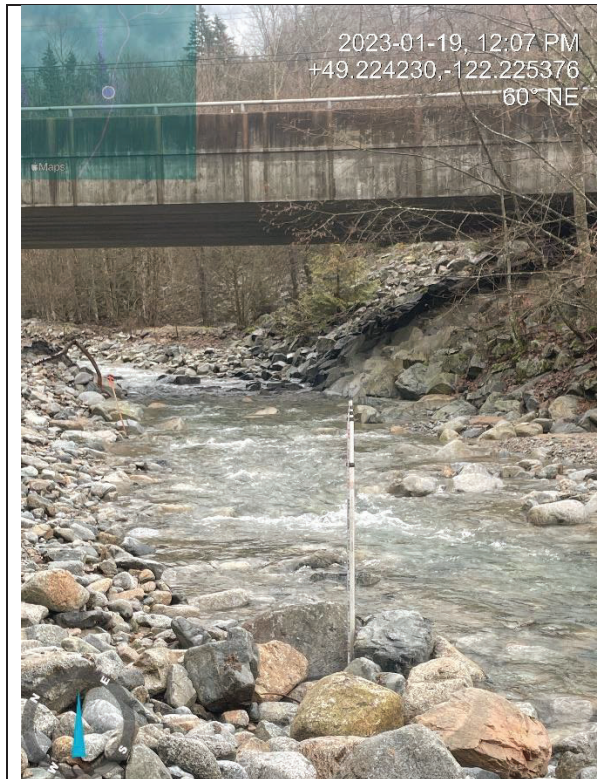


Photo 19. Meter installed upstream to measure creek level during the works (Jan 19, 2023).



Photo 20. East embankment stabilized (Jan 19, 2023)



Photo 22. Sediment deposit removal from creek causing high turbidity monitoring (Jan 19, 2023).



Weekly Environmental Monitor Inspection Form
Pattison Creek Sediment Removal and Bank Protection

Photo 21. Excavator crossed back to remove material buildup in creek (Jan 19, 2023).



Photo 23. Deflection berm gravel bags installed for widening creek inside of berm bags (Jan 19,2023).



Photo 24. Before works. Widening creek channel beside the deflection berm gravel bags (Jan 20, 2023).



Weekly Environmental Monitor Inspection Form

Pattison Creek Sediment Removal and Bank Protection



Photo 28. Set up sediment fencing to slow and settle the turbid flow (Jan 20, 2023).



Photo 29. Excavate turbid material on inside of berm bags, and remove bags for the weekend, placing large boulders back in creek (Jan 20, 2023).

Table 1. IN SITU WATER QUALITY MONITORING RESULTS

Date [DD-MON-YY]	Time (24:00hr)	Turbidity (NTU)	Sample location & observations
January 16, 2023			
16-Jan-23	8:06am	3.96	Prior to works downstream of the site.
16-Jan-23	8:10am	3.81	Downstream of the diversion channel.
16-Jan-23	8:11am	3.51	Downstream of the works area.
16-Jan-23	9:07am	4.85	Downstream of works.
16-Jan-23	9:08am	0.98	Downstream of works.
16-Jan-23	9:16am	13.83	Downstream of works.
16-Jan-23	9:18am	251	Downstream of diversion channel, during diversion.
16-Jan-23	9:23am	319	Downstream of works.
16-Jan-23	9:27am	366	Downstream of works.



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16-Jan-23	9:28am	232	Downstream of works.
16-Jan-23	9:30am	49.80	Downstream of works.
16-Jan-23	9:40am	39.31	Downstream of works.
16-Jan-23	9:52am	17.10	Downstream of works.
16-Jan-23	1:22pm	3.03	Downstream of works.
16-Jan-23	2:23pm	18.35	Initial phase of stream diversion, downstream of works.
16-Jan-23	2:26pm	45.91	Downstream of works.
16-Jan-23	2:27pm	241	Downstream of works.
16-Jan-23	2:29pm	467	Downstream of works.
16-Jan-23	2:29pm	580	Downstream of works.
16-Jan-23	2:30pm	578	Downstream of works.
16-Jan-23	2:31pm	498	Downstream of works.
16-Jan-23	2:32pm	442	Downstream of works.
16-Jan-23	2:34pm	397	Downstream of works.
16-Jan-23	2:36pm	402	Downstream of works.
16-Jan-23	2:38pm	309	Downstream of works.
16-Jan-23	2:40pm	187	Downstream of works.
16-Jan-23	2:42pm	128	Downstream of works.
16-Jan-23	2:44pm	98	Downstream of works.
16-Jan-23	2:49pm	105	Downstream of works.
16-Jan-23	2:53pm	56	Downstream of works.
16-Jan-23	2:54pm	46.05	Downstream of works.
16-Jan-23	3:03pm	93	Downstream of works.
16-Jan-23	3:12pm	91	Removing more bags from diversion channel. Downstream of works.
16-Jan-23	3:15pm	54	Downstream of works.
16-Jan-23	3:18pm	229	Downstream of works.
16-Jan-23	3:27pm	123	Downstream of works.
16-Jan-23	3:53pm	90	Downstream of works.
16-Jan-23	4:05pm	71	Downstream of works.
16-Jan-23	4:34pm	18.44	Works are complete for the day. Downstream of works. Turbidity continued to diminish rapidly. SEI anticipates turbidity dropped below 8 NTU shortly after the EM left site.
January 17, 2023			
17-Jan-23	8:08am	0.00	Downstream of works.
17-Jan-23	10:35am	34.47	Excavator pulls last of bags. Downstream of works.
17-Jan-23	10:51am	15.80	Downstream of works.



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Pattison Creek Sediment Removal and Bank Protection

17-Jan-23	11:05am	25.44	Downstream of works.
17-Jan-23	11:06am	48.12	Downstream of works.
17-Jan-23	11:10am	33.22	Downstream of works.
17-Jan-23	11:12am	22.71	Downstream of works.
17-Jan-23	12:37pm	0.23	Background, upstream of work. Work is complete for the day.
January 18, 2023			
18-Jan-23	7:50am	0.00	Above site; representing background conditions.
18-Jan-23	7:56am	8.72	Excavator starts placing rock in creek to build crossing. Downstream of works.
18-Jan-23	8:02am	10.22`	Downstream of works.
18-Jan-23	8:10am	19.59	Excavator operator cleans tracks before crossing. Downstream of works.
18-Jan-23	8:13am	30.47	Downstream of works.
18-Jan-23	8:16am	16.52	Downstream of works.
18-Jan-23	8:31am	49.83	2-inch hose set up with pump in old creek channel. Downstream of works.
18-Jan-23	8:38am	39.16	Downstream of works.
18-Jan-23	8:48am	9.77	Downstream of works.
18-Jan-23	9:06am	4.85	Pump off. Downstream of works.
18-Jan-23	9:29am	15.51	Downstream of works.
18-Jan-23	9:30am	17.61	Linkbelt placing bags Creekside. Downstream of works.
18-Jan-23	9:42am	20.46	Above site; representing background conditions. Turbidity event upstream.
18-Jan-23	9:46am	23.63	Above site; representing background conditions.
18-Jan-23	9:48am	24.49	Above site; representing background conditions.
18-Jan-23	9:50am	26.87	Above site; representing background conditions.
18-Jan-23	10:05am	17.48	Above site; representing background conditions.
18-Jan-23	10:15am	16.78	Downstream of works.
18-Jan-23	10:28am	7.0	Downstream of works.
18-Jan-23	10:38am	4.18	Downstream of works.
18-Jan-23	10:54am	6.05	Downstream of works.
18-Jan-23	11:11am	3.08	Downstream of works. Pulled the seclusion net out at the end of the old creek channel.



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Pattison Creek Sediment Removal and Bank Protection

			Crew break for lunch.
18-Jan-23	12:09pm	16.91	Above site; representing background conditions.
18-Jan-23	12:22pm	62	Downstream of works.
18-Jan-23	12:23pm	119	Downstream of works.
18-Jan-23	12:31pm	499	High turbidity event happening above site. Turbidity is originating upstream of the site.
18-Jan-23	12:32pm	510	Above site; representing background conditions.
18-Jan-23	12:33pm	534	Above site; representing background conditions.
18-Jan-23	12:35pm	557	Above site; representing background conditions.
18-Jan-23	12:36pm	528	Above site; representing background conditions.
18-Jan-23	12:38pm	484	Above site; representing background conditions.
18-Jan-23	12:41pm	421	Above site; representing background conditions.
18-Jan-23	12:44pm	380	Above site; representing background conditions.
18-Jan-23	1:10pm	50	Both excavators on the other side of creek passing riprap. Downstream of works.
18-Jan-23	1:19pm	41.88	Downstream of works.
18-Jan-23	1:22pm	55	Downstream of works.
18-Jan-23	1:24pm	43.49	Excavator placing riprap along creek east bank.
18-Jan-23	1:38pm	123	Downstream of works.
18-Jan-23	1:46pm	34.93	Downstream of works.
18-Jan-23	1:55pm	16.99	Downstream of works.
18-Jan-23	1:59pm	18.34	Upstream of the works.
18-Jan-23	2:03pm	86	Excavator excavates rock from Creekside to place boulders. Downstream of works.
18-Jan-23	2:09pm	61	Downstream of works.
18-Jan-23	2:12pm	36	Downstream of works.
18-Jan-23	2:22pm	24.46	Downstream of works.
18-Jan-23	2:28pm	33.54	Downstream of works.
18-Jan-23	2:43pm	10.15	Background; upstream of the work site. Site shut down.



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Pattison Creek Sediment Removal and Bank Protection

January 19, 2023			
19-Jan-23	10:37am	0.30	Background; upstream of the works.
19-Jan-23	10:42am	4.87	Excavator starts placing riprap in creek to cross. Downstream of works.
19-Jan-23	10:44am	9.05	Deere 350 excavator crosses first. Downstream of works.
19-Jan-23	10:47am	15.94	Downstream of works.
19-Jan-23	10:48am	22.39	Downstream of works.
19-Jan-23	10:53am	8.34	Excavating beside the creek to place boulders. Downstream of works.
19-Jan-23	11:10am	7.64	Linkbelt excavator works on sloping for the east stabilizing bank. Downstream of works.
19-Jan-23	11:26am	3.56	Downstream of works.
19-Jan-23	11:39am	3.94	Downstream of works.
19-Jan-23	11:57am	1.10	Downstream of works.
19-Jan-23	12:08pm	0.23	Background; upstream of site. Crew break for lunch.
19-Jan-23	12:28pm		Downstream of works.
19-Jan-23	12:40pm	0.00	Background, upstream of the works.
19-Jan-23	12:46pm	3.16	Deere 350 excavator crosses. Downstream of works.
19-Jan-23	1:04pm	0.46	Excavator contouring for bank stabilizing.
19-Jan-23	1:30pm	13.49	Excavator contouring streambank. Downstream of works.
19-Jan-23	1:34pm	20.33	Downstream of works.
19-Jan-23	1:39pm	16.07	Downstream of works.
19-Jan-23	1:44pm	12.12	Downstream of works.
19-Jan-23	1:58pm	51	Excavator contouring beside the creek. Downstream of works.
19-Jan-23	2:02pm	42.46	Downstream of works.
19-Jan-23	2:07pm	71	Downstream of works.
19-Jan-23	2:12pm	33.46	Downstream of works.
19-Jan-23	2:19pm	15.88	Downstream of works.
19-Jan-23	2:25pm	9.05	Downstream of works.
19-Jan-23	2:39pm	10.54	Downstream of works.
19-Jan-23	2:47pm	20.31	Downstream of works.
19-Jan-23	3pm	3.27	Excavator crosses back over pulling rocks out of crossing structure. Downstream of works.



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19-Jan-23	3:16pm	85	Downstream of works.
19-Jan-23	3:18pm	120	Downstream of works.
19-Jan-23	3:21pm	127	Downstream of works.
19-Jan-23	3:30pm	59	Downstream of works.
19-Jan-23	3:40pm	27.79	Excavator moves to place deflection gravel bags. Downstream of works.
19-Jan-23	3:46pm	8.28	Downstream of works.
19-Jan-23	3:57pm	7.45	Downstream of works.
19-Jan-23	4:10pm	-	Work is finished.
January 20, 2023			
20-Jan-23	7:30am	0.00	Background; upstream of the works.
20-Jan-23	8:39am		Downstream of works.
20-Jan-23	9:15am	0.00	Downstream of works. Excavator will start widening creek channel beside berm gravel bags.
20-Jan-23	9:34am	23.75	Downstream of works.
20-Jan-23	9:39am	75	Downstream of works.
20-Jan-23	9:43am	450	Downstream of works.
20-Jan-23	9:50am	78	Downstream of works.
20-Jan-23	9:56am	204	Excavator removing lower gravel bag from berm and placing up the berm. Downstream of works.
20-Jan-23	10:05am	69	Downstream of works.
20-Jan-23	10:16am	307	Downstream of works.
20-Jan-23	10:51am	68	Downstream of works.
20-Jan-23	11:05am	15.27	Downstream of works.
20-Jan-23	11:17am	115	Excavator will try work above the water level to lessen turbidity.
20-Jan-23	11:22am	84	Below works.
20-Jan-23	11:37am	27.09	
20-Jan-23	11:51am	16.21	Excavator moving gravel bags. Downstream of works.
20-Jan-23	11:57am	70	Excavator contouring beside where the bags were. Downstream of works.
20-Jan-23	12:02pm	36.79	Downstream of works. `Crew break for lunch.
20-Jan-23	1:03pm	3.70	Deere 350 excavator continues widening creek channel beside berm bags. Downstream of works.
20-Jan-23	1:15pm	19.55	Downstream of works.
20-Jan-23	1:30pm	17.46	Downstream of works.

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Pattison Creek Sediment Removal and Bank Protection

20-Jan-23	1:45pm	11.19	Excavator grades slope removing some top material. Downstream of works.
20-Jan-23	2pm	25.56	Downstream of works.
20-Jan-23	2:19pm	19.73	2-inch hose and pump installed in wet area to pump sediment to vegetation for biofiltration. Downstream of works.
20-Jan-23	2:35pm	12.98	Downstream of works.
20-Jan-23	2:50pm	31.49	Downstream of works.
20-Jan-23	3:05pm	52	Excavator moves berm gravel bag from end to upper berm. Downstream of works.
20-Jan-23	3:41pm	35.13	Excavator contours streambank. Downstream of works.
20-Jan-23	3:55pm	128	Excavator clears some boulders below the bags. Downstream of works.
20-Jan-23	4:01pm	157	Excavator pulls bags from berm. Downstream of works.
20-Jan-23	4:06pm	62	Crew finish for the day. Downstream of works.

TABLE 2. ENVIRONMENTAL ISSUE, NON-CONFORMANCE, INCIDENT AND CORRECTIVE ACTION SUMMARY TABLE

No ongoing environmental issues, non-conformance or incidents were identified. See table below for past issue tracking.

Issue No.	Environmental Issue / Non-Conformance and Location	Date Identified [DD-MON-YY]	Description of Environmental Issue and Corrective Action Plan	Due Date [DD-MON-YY]	Date Completed [DD-MON-YY]
-	-	-	-	-	-



Weekly Environmental Monitor Inspection Form Pattison Creek Sediment Removal and Bank Protection

Week:	January 22 - 28, 2023	Environmental Monitor(s):	Stephenie Charleson, Gabi Trainor, Nate Lui.
Supervising QEP:	Matthew Joyce (R.B.Tech)	Weather conditions:	rain
Days on site:	January 23, 2023 January 24, 2023 January 25, 2023 January 26, 2023 January 27, 2023	Total precipitation (week):	9.7 mm retrieved from: https://vancouver.weatherstats.ca/charts/precipitation-daily.html
		Peak precipitation (24 hr period):	3.9 mm retrieved from: https://vancouver.weatherstats.ca/charts/precipitation-daily.html
Description of Work Activities performed:	January 23 Summit excavated upper west diversion, using material for west bank stabilization. Summit pumped sediment-laden ground seepage flow to vegetation for biofiltration. Diversion deflection gravel bags were installed upstream from works for isolation. Large riprap was placed at the toe of excavation for the bank stabilization. January 24 Summit excavated in the dry to depth for right bank riprap placement. Summit also excavated below the bridge to widen beside creek channel. January 25 Summit backfilled in the historic channel with native bedload material. Summit used a 2-inch pump to divert sediment-laden flow accumulated in old creek channel. Summit voluntarily suspended the works due to a perceived land slide event upstream and outside of the project extents. January 26 Back filling and streambank contouring continued. Riprap was delivered onsite. Instream works involved grading stream banks, sediment removal from the stream bank and placing gravel bags for works the next day. January 27 Excavating the right creek diversion channel beside the deflection gravel berm bags continued. Exclusion and salvage of the middle creek flow while removing deflection gravel berm bags. Excavating surface material and widening the creek below the bridge also continued.		

Environmental Monitoring Activity	Y/N/NA	Comments
Erosion and Sediment Control		
Were ESC supplies onsite?	Y	Pumps and hoses were on site as necessary.
Were disturbed areas protected from wind/water erosion?	Y	Pattison Creek was diverted slowly, under supervision of the EM, in order to avoid undue erosion.
Were ESC mitigation measures employed (e.g., for drainage)?	Y	Sediment laden water from the diversion channel was pumped to vegetation to prevent release to Pattison Creek.
Were stockpiles secured (covered or surrounded in sediment fence)?	Y	Boulders and material stockpiles were not observed to release sediment.
Observations?	N	No other notable observations.
Vegetation/clearing Management		
Was equipment clean and free of weeds?	Y	Equipment appeared clean and free of vegetation material.
Was invasive plant species handling, and disposal methodology implemented?	N/A	-
Was site restoration activity implemented?	N/A	-

Weekly Environmental Monitor Inspection Form

Pattison Creek Sediment Removal and Bank Protection

Were wildlife observations reported?	N	No wildlife was observed or reported to the EM.
Were waste containers for food, fuels, oils, sanitary waste in use?	N	-
Observations?	N	No other notable observations.
Site Isolation and Fish Salvage		
Were instream works were conducted in isolation of streamflow?	N	Water quality was monitored while works were in progress.
Were instream works were conducted during appropriate flow conditions?	Y	Water flow levels were medium to high. Summit discussed water level and appropriate mitigations with the EM to suitably mitigate against the undue release of sediment and maintain bank stability during moderate-high flows.
Instream works were preceded by a fish salvage by SEI.	Y	Sartori and Leq'a:mel First Nation representatives salvaged fish during the diversion to avoid prohibited death of fish by stranding.
Was fish mortality/injury observed?	Y	A single (1) sculpin, and a single (1) rainbow trout mortality were observed during the fish salvage. The mortalities may be attributable to natural fluctuations in water level.
Was the SEI EM present during instream works?	Y	Water quality was monitored during the works.
Did induced water quality remain within BC Working Water Quality Guidelines for Aquatic Life.	Y	EM worked with the excavator operator to establish an appropriate pace and WQ was monitored.
Observations	N	-
Solid Waste Management		
Waste bins labeled?	N/A	-
Were portable toilets >30m from waterbodies?	Y	-
Housekeeping; was site clean?	Y	The site appeared to be in good, clean condition. Summit picked up local garbage and recycling seen outside of works areas.
Contaminated Soils Management		
Potentially contaminated soils found?	N	No contaminated soils were observed
Potentially contaminated soils found are stockpiled separately (detected by odour, sheen, buried debris)	N/A	-
Contaminated soils are stockpiled appropriately and tracked for original location	N/A	-
Observations?	N/A	-
Hazardous Materials and Spill Response		
Materials and fuels in secondary containment & protected from weather?	Y	-
Materials labeled per WHMIS/TDG requirements?	Y	-
Spill response procedures, spill kit, and fire extinguisher present/accessible?	Y	Spill kit (x2) observed on site by muster area. Each machine spill kits inside.
Spill trays in use (small immobile or mobile equipment)?	Y	Spill trays placed under machines when not in use.
Refueling procedures followed (no smoking, monitor pumps, automatic shutoffs etc.)?	Y	Refueling was observed with spill cloth to capture any drip.



Weekly Environmental Monitor Inspection Form

Pattison Creek Sediment Removal and Bank Protection

Did refueling occur >30m from water?	Y	-
MSDS available?	N/A	-
Observations	N	No other notable observations.
First Nations/Heritage Resources		
Did the Leq'a:mel First Nation representative identify any environmental concerns?	N	-
Archaeological chance finds reported?	N	No chance finds were reported to EM.
PHOTODOCUMENTATION		
 Photo 1. South facing view, prior to works. Summit will excavate for the right diversion creek channel and use the material for the West bank stabilization (Jan. 23, 2023).	 Photo 2. South-facing view prior to diversion deflection gravel bags installed right side of creek (Jan. 23, 2023).	
 Photo 3. Southwest-facing view of right creek side west bank riprap placement for stabilization (Jan 23, 2023).		



Weekly Environmental Monitor Inspection Form
Pattison Creek Sediment Removal and Bank Protection

PHOTODOCUMENTATION



Photo 4. Northeast facing view prior to day's works below the bridge (Jan 24, 2023).



Photo 5. South-facing view of excavation downstream of the bridge to widen the creek channel (Jan 24, 2023)



Photo 6. North-facing view of excavation of the river right diversion channel looking up. Riprap placement on right bank, as well armoring opposite bank with boulders (Jan 25, 2023).



Photo 7. North-facing view downstream of the bridge of riprap placement along right bank (Jan. 25, 2023).



Weekly Environmental Monitor Inspection Form
Pattison Creek Sediment Removal and Bank Protection

PHOTODOCUMENTATION



Photo 8. South-facing view of bank contouring along the right bank (Jan 26, 2023).



Photo 9. North-facing view of diversion (Jan 26, 2023).



Photo 10. Northwest-facing view of ~25% flow in river right diversion channel. Deflection berm gravel bags being removed upstream. Salvage started in the afternoon. (Jan 26, 2023).



Photo 11. Southeast-facing view of fish exclusion fencing installed in the middle creek flow, removed after salvage was complete and deflection gravel berm bags removed (Jan 27, 2023).



Weekly Environmental Monitor Inspection Form
Pattison Creek Sediment Removal and Bank Protection



Photo 12. South-facing view prior to excavation beside last deflection gravel berm bags river right (Jan. 27, 2023).



Photo 13. Southwest-facing view of deflection gravel berm bags removed. Right creek flow 50%, left creek flow 35%, middle creek flow 15%. (Jan. 27, 2023).



Weekly Environmental Monitor Inspection Form

Pattison Creek Sediment Removal and Bank Protection

Table 1. IN SITU WATER QUALITY MONITORING RESULTS			
Date [DD-MON-YY]	Time (24:00hr)	Turbidity (NTU)	Sample location & observations
January 23, 2023			
23-Jan-23	9:35am	4.64	Upstream, before works.
23-Jan-23	10:00am	7.55	Downstream from active works.
23-Jan-23	10:20am	1.86	Upstream, above works.
23-Jan-23	10:25am	4.05	Downstream of works.
23-Jan-23	10:40am	0.38	Upstream, above works.
23-Jan-23	10:45am	7.832	Downstream of works.
23-Jan-23	11:00am	26.04	Downstream of excavator pulling back bank boulders to place deflection gravel bags along the bank (upstream of works).
23-Jan-23	11:10am	5.61	Downstream of gravel bag works.
23-Jan-23	11:15am	0.26	Upstream of works.
23-Jan-23	11:30am	3.63	Downstream of works.
23-Jan-23	11:45am	1.63	Upstream of works.
23-Jan-23	12:00pm	3.59	Downstream of works.
23-Jan-23	12:30pm	1.70	Upstream above works.
23-Jan-23	12:40pm	3.32	Downstream of works.
23-Jan-23	13:05pm	2.87	Downstream of works.
23-Jan-23	13:30pm	3.25	Downstream of works.
23-Jan-23	13:35pm	0.43	Upstream from works.
23-Jan-23	13:45pm	0.51	Downstream of works.
23-Jan-23	14:15pm	1.70	Downstream of works.
23-Jan-23	14:30pm	0.69	Upstream.
23-Jan-23	14:40pm	3.44	Downstream.
23-Jan-23	15:05pm	2.37	Downstream
23-Jan-23	15:55pm	0.84	Upstream
23-Jan-23	16:05pm	0.97	Downstream.
January 24, 2023			
24-Jan-23	7:47am	0.0	Upstream. Before works.
24-Jan-23	8:33am	0.19	Downstream of works.
24-Jan-23	9:45am	0.0	Downstream of works.



sartori

ASSESSMENT | PLANNING | COMPLIANCE

Weekly Environmental Monitor Inspection Form Pattison Creek Sediment Removal and Bank Protection

24-Jan-23	10:39am	0.0	Downstream of works.
24-Jan-23	11:25am	0.0	Downstream of works. Lunch break.
24-Jan-23	12:14pm	0.0	Downstream of works resumed.
24-Jan-23	13:31pm	0.0	Downstream of works.
24-Jan-23	14:34pm	0.0	Downstream of works.
24-Jan-23	16:19pm	0.0	Works are complete for the day.
January 25, 2023			
25-Jan-23	7:55am	1.87	Upstream. Before works.
25-Jan-23	8:48am	0.31	Downstream of works.
25-Jan-23	9:26am	3.31	Downstream of works.
25-Jan-23	9:45am	3.89	Downstream of works.
25-Jan-23	10:05am	5.46	Downstream of works.
25-Jan-23	10:32am	1.72	Downstream of works.
25-Jan-23	10:52am	7.62	Downstream of works.
25-Jan-23	11:05am	4.10	Downstream of works.
25-Jan-23	11:23am	12.72	Downstream.
25-Jan-23	11:39am	13.81	Downstream.
25-Jan-23	11:54am	11.72	Downstream.
25-Jan-23	11:58am	0.0	Upstream above works.
25-Jan-23	12:42pm	0.0	Upstream above works.
25-Jan-23	12:50pm	4.36	Downstream below works.
25-Jan-23	13:22pm	25.17	Downstream. More ground flow as excavating progresses upslope.
25-Jan-23	13:39pm	32.22	Downstream.
25-Jan-23	14:18pm	16.50	Downstream.
25-Jan-23	14:33pm	7.56	Downstream.
25-Jan-23	14:59pm	7.74	Downstream.
25-Jan-23	15:30pm		Leave site. Works continue tomorrow.
January 26, 2023			
26-Jan-23	7:55am	2.74	Upstream. Before works.
26-Jan-23	8:04am	8.36	Downstream below works. After pumps set up to pump to vegetation.
26-Jan-23	8:25am	6.02	Downstream of works.
26-Jan-23	8:51am	16.49	Downstream.
26-Jan-23	9:14am	16.95	Downstream of works.
26-Jan-23	9:44am	16.91	Downstream of works.
26-Jan-23	10:26am	28.14	Downstream.
26-Jan-23	10:50am	397	Downstream. Opening at head of creek channel. 15% right creek flow/85% left creek flow.



Weekly Environmental Monitor Inspection Form
Pattison Creek Sediment Removal and Bank Protection

26-Jan-23	11:05am	68	Downstream of works. Pulling deflection gravel bags from the lower end of bag berm.
26-Jan-23	11:26am	245	Downstream. Excavating material from where the bag was.
26-Jan-23	11:31am	508	Downstream of works.
26-Jan-23	11:53am	27.32	Downstream. Lunch break. Works no longer instream.
26-Jan-23	12:30	Visually-clear	Salvage in the afternoon. Creek flows clear and return to normal.
January 27, 2023			
27-Jan-23	7:56am	4.0	Upstream. Before works.
27-Jan-23	9:13am		Exclusion fencing setup at head of middle creek channel for electrofishing, salvage until the afternoon.
27-Jan-23	13:02pm	2.05	Downstream from works. Excavating beside berm bags to widen the right creek.
27-Jan-23	13:52pm	0.17	Downstream of works.
27-Jan-23	14:25pm	0.35	Downstream of works.
27-Jan-23	14:34pm	60	Placing large riprap in front at the rock berm.
27-Jan-23	14:37pm	53	Excavator pulls deflection berm bags.
27-Jan-23	15:21pm	4.81	Removing bags still.
27-Jan-23	15:25pm	34.28	Last deflection gravel berm bag removed.
27-Jan-23	15:30pm	19.15	Downstream of works.
27-Jan-23	16:35pm	421	Excavating material from top of access trail below the bridge.
27-Jan-23	14:39pm	24.40	Downstream of works.
27-Jan-23	16:42pm	16.14	Downstream.
27-Jan-23	16:46pm	13.87	Creek flow clears. Crew leave site, done for the day.

Weekly Environmental Monitor Inspection Form

Pattison Creek Sediment Removal and Bank Protection

TABLE 2. ENVIRONMENTAL ISSUE, NON-CONFORMANCE, INCIDENT AND CORRECTIVE ACTION SUMMARY TABLE

No ongoing environmental issues, non-conformance or incidents were identified. See table below for past issue tracking.

Issue No.	Environmental Issue / Non-Conformance and Location	Date Identified [DD-MON-YY]	Description of Environmental Issue and Corrective Action Plan	Due Date [DD-MON-YY]	Date Completed [DD-MON-YY]
-	-	-	-	-	-

Appendix O



Leq'á:mel First Nation

43101 Leq'á:mel Way, Deroche BC V0M 1G0

(604) 826-7976 www.leqamel.ca

Natural Resource Department: Daily Environmental Monitoring Report

Report Number:001				Location (Or Closest Address): Pattison Creek, Sylvester Rd – Hatzic Prairie	
Date: 2022-12-16		Time: 10:30 – 12:30			
Monitor Name: Rick McKamey Tina Pederson				Signature:	
Meetings: NA					
Meeting Participants: NA					
Contractor(s) On Site: Summit Earthworks (Jeof) AE (Lorne) AE (Trevor) LFN (Tina) LFN (Rick) Traffic control				Name of Construction Representative Present:	
Weather Conditions (Cloud Cover, Wind, Precipitation, Temperature, etc.): 2° Clear skies.					
Ground Conditions: Dry ☒ Wet ☐ Saturated ☐					
Completed Construction Activities (Since Last Visit): Access for Sylvester Rd grubbed out and established. Porta potties set on site.					
Construction Activities: Grubbing access and establishing stream access.					Photos:
					#1
					#2
Construction Equipment Being Used: 245 Case excavator. Enviro friendly fuel set up.					Photos:
					#3
Environmental Site Conditions (NC = Non-Compliant, NA = Not Applicable)					
Boundary Flagging	OK	NC	NA	Comments & Mitigation	Photos:
General Construction	X				
Riparian Zone(s)	X				
Env. Sensitive Features	X				
Other					
Water Quality	OK	NC	NA	Comments & Mitigation	Photos:
Turbidity	X				
Temperature	X				
DO					
pH					

Natural Resource Department: Daily Environmental Monitoring Report

Conductivity					
Other					
Erosion & Sediment Control	OK	NC	NA	Comments & Mitigation	Photos:
Silt Fencing	X				
Bank Stabilization					
Soil Stockpiles					
Drainage & Diversions					
Detention Facilities					
Other					
Fuel & Oil Management	OK	NC	NA	Comments & Mitigation	Photos:
Spill Kits/SPER Plan	X			On site.	
Fuel Storage	X				
Other					
Equipment	OK	NC	NA	Comments & Mitigation	Photos:
Condition (leaks, etc.)	X				
Initial Cleaning (Mud, Seeds)	X				
Other					
Waste Management	OK	NC	NA	Comments & Mitigation	Photos:
Sanitary Facilities	X			On site.	
Solid Waste & Recycling					
Special Waste & Hazardous Materials					
Other					
Atmosphere	OK	NC	NA	Comments & Mitigation	Photos:
Dust	X				
Air Quality	X				
Other					
Vegetation Management	OK	NC	NA	Comments & Mitigation	Photos:
Invasive Plants	X			Nonvisible.	
Other					
General Observations & Comments (Wildlife, New Sensitive Features, etc.): Preconstruction center line established, green zone to plan marked – Project Ext proposed center line channel marking ~ 50m down flow.					Photos:
					#4
Other Comments: No archaeological or culturally significant finds.					Photos:
Upcoming Construction Events: Extraction of sediment to existing base bottom bank of daily flow channel. Channeling to west of present flow channel with ~ 6m base bottom & 3-1 toed banks.					

Natural Resource Department: Daily Environmental Monitoring Report

Incident Report Required?	Yes ☐	No ☒

Photo #1



Photo #2



Photo #3



Photo #4





Leq'á:mel First Nation

43101 Leq'á:mel Way, Deroche BC V0M 1G0

(604) 826-7976 www.leqamel.ca

Natural Resource Department: Daily Environmental Monitoring Report

Report Number: 002		Location (Or Closest Address): Pattison Creek – Silvester Rd – Hatzic Prairie			
Date: 2022-12-19	Time: 12pm – 4:30pm				
Monitor Name: Rick McKamey Tina Pederson		Signature:			
Meetings: NA					
Meeting Participants: NA					
Contractor(s) On Site: Summit Earth Works Sartori Environmental Associated Engineering LFN		Name of Construction Representative Present: Geof Steph Lorne Rick Tina			
Weather Conditions (Cloud Cover, Wind, Precipitation, Temperature, etc.): -10° Low hanging cloud, snow and icy conditions.					
Ground Conditions: Dry ☐ Wet ☒ Saturated ☐					
Completed Construction Activities (Since Last Visit): Construction Signage in place along Sylvester Rd. Equipment unloaded.					
Construction Activities: Bedload extraction underway, material being moved from creek bed to west bank erosion point. Access road built up with bedload material.			Photos: #1 #2		
Construction Equipment Being Used: - 245 Case excavator - DA30 haul truck - 350G Brant excavator - 245 Inland excavator			Photos: #3 #4		
Environmental Site Conditions (NC = Non-Compliant, NA = Not Applicable)					
Boundary Flagging	OK	NC	NA	Comments & Mitigation	Photos:
General Construction	X				
Riparian Zone(s)	X				
Env. Sensitive Features	X				
Other					
Water Quality	OK	NC	NA	Comments & Mitigation	Photos:
Turbidity	X				
Temperature	X				
DO					
pH					

Natural Resource Department: Daily Environmental Monitoring Report

Conductivity					
Other					
Erosion & Sediment Control	OK	NC	NA	Comments & Mitigation	Photos:
Silt Fencing			X		
Bank Stabilization	X				
Soil Stockpiles	X				
Drainage & Diversions					
Detention Facilities					
Other					
Fuel & Oil Management	OK	NC	NA	Comments & Mitigation	Photos:
Spill Kits/SPER Plan	X			On site.	
Fuel Storage	X				
Other					
Equipment	OK	NC	NA	Comments & Mitigation	Photos:
Condition (leaks, etc.)	X			Machines maintained with enviro friendly fuel.	
Initial Cleaning (Mud, Seeds)	X				
Other					
Waste Management	OK	NC	NA	Comments & Mitigation	Photos:
Sanitary Facilities	X				
Solid Waste & Recycling					
Special Waste & Hazardous Materials					
Other					
Atmosphere	OK	NC	NA	Comments & Mitigation	Photos:
Dust	X				
Air Quality	X				
Other					
Vegetation Management	OK	NC	NA	Comments & Mitigation	Photos:
Invasive Plants	X			None visible.	
Other					
General Observations & Comments (Wildlife, New Sensitive Features, etc.): No archaeological or culturally sensitive finds. Conditions are snow and ice with low visibility at times.					Photos:
Other Comments:					Photos:
Upcoming Construction Events: Extraction of sediment to existing base bottom bank of daily flow channel. Channeling to west of present flow channel with ~ 6m base bottom & 3-1 toed banks.					

Natural Resource Department: Daily Environmental Monitoring Report

Incident Report Required?	Yes ☐	No ☒

Photo #1



Photo #2



Photo #3



Photo #4





Leq'á:mel First Nation

43101 Leq'á:mel Way, Deroche BC V0M 1G0

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Natural Resource Department: Daily Environmental Monitoring Report

Report Number:003				Location (Or Closest Address):	
Date: 2023-01-05		Time: 8 - 4pm		Silvester Rd – Hatzic Prairie	
Monitor Name: Tina Pederson				Signature:	
Meetings: 11 am meeting to go over extension to lower South reach of Pattison Creek, as well as review current plans for emergency work in place.					
Meeting Participants:					
Geof (Summit)		Andrew (A.E)		Rick (LFN)	
Stephanie (Sartori env.)		Dianna (A.E)		Lorne (A.E)	
Tina (LFN)					
Contractor(s) On Site:				Name of Construction Representative Present:	
Summit Earthworks Sartori Environmental				Geof Stephanie	
Weather Conditions (Cloud Cover, Wind, Precipitation, Temperature, etc.): 5° Cloudy with periods of rain					
Ground Conditions: Dry ☐ Wet ☒ Saturated ☐					
Completed Construction Activities (Since Last Visit):					
Construction Activities:					Photos:
- Cross Pattison creek to remove woody debris and prep for armor of the NE bank					#1
- Prep NE bank for 3:1 & riprap					#2
- Improving N slope and access point					
- Mob in riprap for armor 6 loads 500 class rock & 2 loads 300 class					
- Creating access to lower South reach of creek					
- Stock piling of woody debris					
Construction Equipment Being Used:					Photos:
- Case 245 – excavator - DA30 – Haul truck					
- Inland 245 – Excavator - 1x Summit Dump truck					
- Brant 350 – Excavator - 2x Traffic control on site					
Environmental Site Conditions (NC = Non-Compliant, NA = Not Applicable)					
Boundary Flagging	OK	NC	NA	Comments & Mitigation	Photos:
General Construction	X				#3
Riparian Zone(s)	X				
Env. Sensitive Features	X				
Other					
Water Quality	OK	NC	NA	Comments & Mitigation	Photos:
Turbidity	X			Turbidity present during crossing of Pattison creek	
Temperature	X				
DO					

Natural Resource Department: Daily Environmental Monitoring Report

pH					
Conductivity					
Other					
Erosion & Sediment Control	OK	NC	NA	Comments & Mitigation	Photos:
Silt Fencing	X			Present on site if needed	
Bank Stabilization	X				
Soil Stockpiles	X				
Drainage & Diversions	X				
Detention Facilities					
Other					
Fuel & Oil Management	OK	NC	NA	Comments & Mitigation	Photos:
Spill Kits/SPER Plan	X			Present and being used for all machines	
Fuel Storage	X				
Other					
Equipment	OK	NC	NA	Comments & Mitigation	Photos:
Condition (leaks, etc.)	X				
Initial Cleaning (Mud, Seeds)	X				
Other					
Waste Management	OK	NC	NA	Comments & Mitigation	Photos:
Sanitary Facilities	X				#4
Solid Waste & Recycling				Not visible on site	
Special Waste & Hazardous Materials	x				
Other					
Atmosphere	OK	NC	NA	Comments & Mitigation	Photos:
Dust	x				
Air Quality	x				
Other					
Vegetation Management	OK	NC	NA	Comments & Mitigation	Photos:
Invasive Plants	x			No invasive plant species visible	
Other					
General Observations & Comments (Wildlife, New Sensitive Features, etc.):					Photos:
No culturally sensitive or archaeological finds today; no visible amphibian or wildlife; no visible fish in stream today. Stream crossing was successful with minimal disturbance. Mild turbidity caused from rock placement that cleared up within a few minutes after crossing, Machine did not touch the water.					
Other Comments: Plans to extend the length of bank armor on the N side of Pattison creek, below the Moti bridge. As directed by Andrew (AE)					#5
Other Comments:					Photos:

Natural Resource Department: Daily Environmental Monitoring Report

Upcoming Construction Events:

- Armor NE bank with rip rap and native materials
- Continue to prepare access to lower reach & NE side of creek
- Armor north and northwest bank with riprap and native material
- Remove debris and sediment build up from main channel

Incident Report Required?

Yes ☐

No ☒

Photo #1



Photo #2



Photo #3



Photo #4



Natural Resource Department: Daily Environmental Monitoring Report

Photo # 5





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Natural Resource Department:
Daily Environmental Monitoring Report

Report Number:002		Location (Or Closest Address): Pattison Creek/Sylvester Road – Durieu/Hatzic			
Date:2023-01-06	Time: 8AM-11:30AM				
Monitor Name: Jason Thompson		Signature:			
Meetings:					
Meeting Participants:					
Contractor(s) On Site: Summit Earthworks Associated Engineering Sartori		Name of Construction Representative Present:			
Weather Conditions (Cloud Cover, Wind, Precipitation, Temperature, etc.): 8°/5°; Broken cloud/no rain					
Ground Conditions: Dry ☐ Wet ☐ Saturated ☐					
Completed Construction Activities (Since Last Visit): Site access road extended into creek side area					
Construction Activities:			Photos:		
Construction Equipment Being Used: CX2450 Excavator; 350G Excavator; 245 Excavator; DA 30 Rocktruck			Photos:		
Environmental Site Conditions (NC = Non-Compliant, NA = Not Applicable)					
Boundary Flagging	OK	NC	NA	Comments & Mitigation	Photos:
General Construction	X			Traffic cones at site access; sign w/site info requirements	
Riparian Zone(s)					
Env. Sensitive Features					
Other					
Water Quality	OK	NC	NA	Comments & Mitigation	Photos:
Turbidity	X			No concerns from Sartori during turbidity testing	
Temperature	X				
DO	X				
pH	X				
Conductivity	X				
Other					

Natural Resource Department: Daily Environmental Monitoring Report

[illegible]

Natural Resource Department:
Daily Environmental Monitoring Report

PHOTO LOG – 2023/01/06

PHOTO #1 – Boulder crossing installation



PHOTO #2 - Fish carcass located approximately 2m below boulder crossing

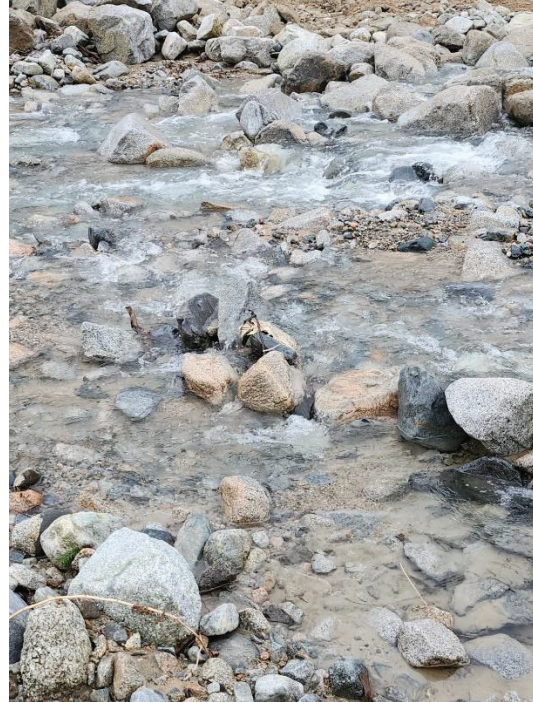


PHOTO #3 – Rip rap armouring installation along top of east bank

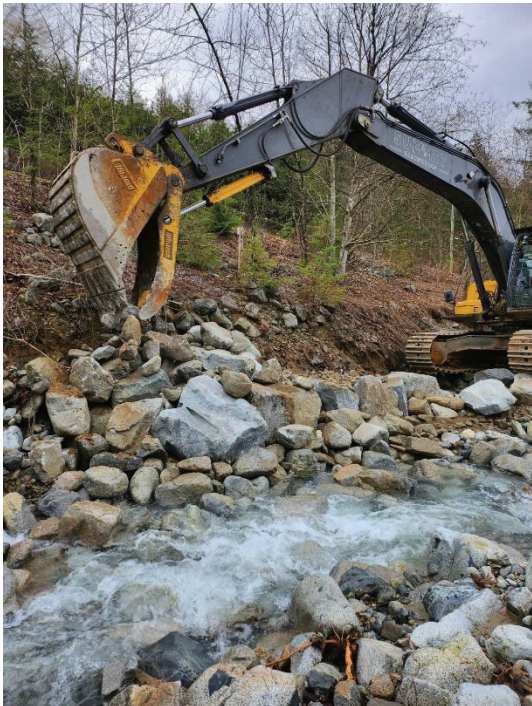


PHOTO #4 – Silt fencing onsite and trash bag in use for refuse





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Natural Resource Department:
Daily Environmental Monitoring Report

Report Number:003		Location (Or Closest Address): Pattison Creek/Sylvester Road - Durieu			
Date:2023-01-09	Time: 8AM-3PM				
Monitor Name: Jason Thompson		Signature:			
Meetings:					
Meeting Participants:					
Contractor(s) On Site: Summit Earthworks A&E Sartori		Name of Construction Representative Present:			
Weather Conditions (Cloud Cover, Wind, Precipitation, Temperature, etc.): 7°/5°, feels like 3°; Cloud cover, chance of light rain					
Ground Conditions: Dry ☐ Wet ☐ Saturated ☐					
Completed Construction Activities (Since Last Visit): Access road extended to lower reach, woody debris removal					
Construction Activities: Woody debris removal in lower reach; access and prep for new channel into lower reach; armoring of undermined erosion points/hazardous trees			Photos:		
Construction Equipment Being Used: CX2450 Excavator; 350G Excavator; 245 Excavator; DA 30 Rocktruck			Photos:		
Environmental Site Conditions (NC = Non-Compliant, NA = Not Applicable)					
Boundary Flagging	OK	NC	NA	Comments & Mitigation	Photos:
General Construction	X			Traffic cones at site access; sign w/site info requirements	
Riparian Zone(s)					
Env. Sensitive Features					
Other					
Water Quality	OK	NC	NA	Comments & Mitigation	Photos:
Turbidity	X			Sartori tested/monitors water quality; no concerns	
Temperature	X				
DO	X				
pH	X				
Conductivity	X				
Other					

Natural Resource Department: Daily Environmental Monitoring Report

[illegible]

Natural Resource Department:
Daily Environmental Monitoring Report

PHOTO LOG – 2023/01/09

PHOTO #1 – Woody debris removal at bottom of lower reach



PHOTO #2 - Spill tray in use in lower reach

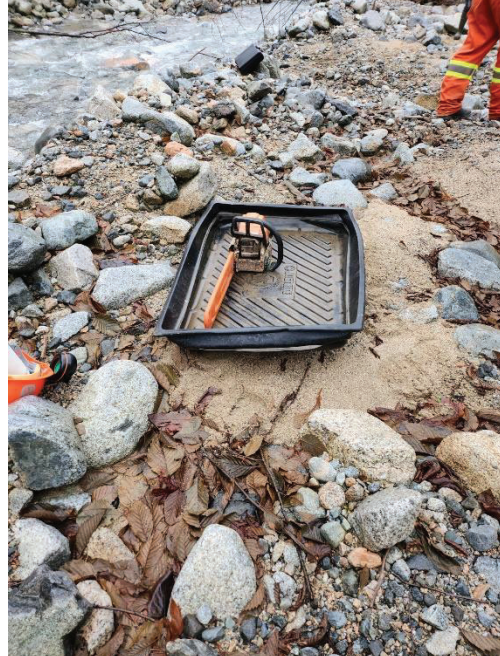


PHOTO #3 – Boney material used to armor eroded root mass



PHOTO #4 – Woody debris stockpile at site entrance





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Natural Resource Department:
Daily Environmental Monitoring Report

Report Number:004		Location (Or Closest Address): Pattison Creek/Sylvester Road - Durieu			
Date:2023-01-10	Time: 730AM-330PM				
Monitor Name: Jason Thompson		Signature:			
Meetings:					
Meeting Participants:					
Contractor(s) On Site: Summit Earthworks A&E Sartori		Name of Construction Representative Present:			
Weather Conditions (Cloud Cover, Wind, Precipitation, Temperature, etc.): 7°/5°, feels like 3°; Cloud cover, chance of light rain					
Ground Conditions: Dry ☐ Wet ☐ Saturated ☐					
Completed Construction Activities (Since Last Visit): Woody debris removal in lower reach; access and prep for new channel into lower reach; armoring of undermined erosion points/hazardous trees					
Construction Activities: Removal of woody debris stockpile/transported to Mission City dump(traffic control onsite); No creek work, awaiting arrival of sandbags; Cont'd armoring of west bank erosion with boney material; (4) small trees removed at outflow in prep for new centre channel			Photos:		
Construction Equipment Being Used: CX2450 Excavator; 350G Excavator; 245 Excavator; DA 30 Rocktruck			Photos:		
Environmental Site Conditions (NC = Non-Compliant, NA = Not Applicable)					
Boundary Flagging	OK	NC	NA	Comments & Mitigation	Photos:
General Construction	X			Traffic control/flaggers and signage onsite	
Riparian Zone(s)	X			Armoring of west bank erosion along riparian zone	
Env. Sensitive Features					
Other					
Water Quality	OK	NC	NA	Comments & Mitigation	Photos:
Turbidity			X	No creek works this day; no concerns or testing required	
Temperature			X		
DO			X		
pH			X		
Conductivity			X		
Other					

Natural Resource Department: Daily Environmental Monitoring Report

[illegible]

Natural Resource Department:
Daily Environmental Monitoring Report

PHOTO LOG – 2023/01/10

PHOTO #1 – Traffic control onsite to support transport truck carrying woody debris



PHOTO #2 - Woody debris loaded into transport truck



PHOTO #3 – Boney material used to armor eroded bank



PHOTO #4 – Small trees removed at outflow





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**Natural Resource Department:
 Daily Environmental Monitoring Report**

Report Number:005		Location (Or Closest Address): Pattison Creek/Sylvester Road - Durieu			
Date:2023-01-11	Time: 730AM-330PM				
Monitor Name: Jason Thompson		Signature:			
Meetings:					
Meeting Participants:					
Contractor(s) On Site: Summit Earthworks A&E Sartori		Name of Construction Representative Present:			
Weather Conditions (Cloud Cover, Wind, Precipitation, Temperature, etc.): 8°/3°, feels like 3°; Cloud cover, chance of light rain					
Ground Conditions: Dry ☐ Wet ☐ Saturated ☐					
Completed Construction Activities (Since Last Visit): Removal of woody debris stockpile/transported to Mission City dump(traffic control onsite); No creek work, awaiting arrival of sandbags; Cont'd armoring of west bank erosion with boney material; (4) small trees removed at outflow in prep for new centre channel					
Construction Activities: Sand bag placement along proposed diversion channel; tree removal along proposed diversion channel and east bank erosion in prep for infill of east bank erosion, no visible turbidity during tree/root removal.			Photos:		
Construction Equipment Being Used: CX2450 Excavator; 350G Excavator; 245 Excavator; DA 30 Rocktruck			Photos:		
Environmental Site Conditions (NC = Non-Compliant, NA = Not Applicable)					
Boundary Flagging	OK	NC	NA	Comments & Mitigation	Photos:
General Construction	X			Traffic control/flaggers and signage onsite	
Riparian Zone(s)	X			Armoring of west bank erosion along riparian zone	
Env. Sensitive Features					
Other					
Water Quality	OK	NC	NA	Comments & Mitigation	Photos:
Turbidity	X			No visible turbidity during tree/root removal, no concerns	
Temperature			X		
DO			X		
pH			X		
Conductivity			X		
Other					

Natural Resource Department: Daily Environmental Monitoring Report

Erosion & Sediment Control	OK	NC	NA	Comments & Mitigation	Photos:
Silt Fencing	X			Silt fencing onsite in lower reach ready for use	
Bank Stabilization	X			Boney material used to armor eroded banks/trees	
Soil Stockpiles	X			Woody debris stockpiled awaiting site removal	
Drainage & Diversions			X	Sand bag placement along diversion channel opening	
Detention Facilities			X		
Other				No concerns of ESC measures during site visit	
Fuel & Oil Management	OK	NC	NA	Comments & Mitigation	Photos:
Spill Kits/SPER Plan	X			Spill trays in use; spill kits onsite	
Fuel Storage				No fuel storage seen onsite	
Other	X			Spill pads/kits on hand for refueling	
Equipment	OK	NC	NA	Comments & Mitigation	Photos:
Condition (leaks, etc.)	X			Equipment appears leak free	
Initial Cleaning (Mud, Seeds)	X			No visible signs of invasive vegetation	
Other					
Waste Management	OK	NC	NA	Comments & Mitigation	Photos:
Sanitary Facilities	X			Men/Women porto-potties onsite	
Solid Waste & Recycling	X			No refuse onsite; no waste/recycle containers onsite	
Special Waste & Hazardous Materials			X	No special/hazardous material seen onsite	
Other					
Atmosphere	OK	NC	NA	Comments & Mitigation	Photos:
Dust					
Air Quality					
Other					
Vegetation Management	OK	NC	NA	Comments & Mitigation	Photos:
Invasive Plants	X				
Other					
General Observations & Comments (Wildlife, New Sensitive Features, etc.):					Photos:
Const. Activity: See P.1 <u>Construction Activities</u> ; Walk of lower Pattison Creek lower reach, noted one main visible erosion point along east bank, no further erosion all the way to confluence of Pattison/Legacy creeks.					
Fuel/Waste: No visible sheen/spills throughout site, under machines or visible in spill trays					
Other Comments:					Photos:
Cultural Monitoring: Continues to be no visible signs of archeological or cultural heritage evidence; no signs of fish in wetted areas; no signs of terrestrial wildlife frequenting areas; Walk of proposed infill area of east bank erosion and down to Pattision/Legacy confluence with no visible sign of fish.					
Upcoming Construction Events: Opening up of lower end of diversion channel/new centre channel, semi-dewatering of eastern erosion channel in prep for fish salvage.					
Incident Report Required? Yes ☐ No ☐					

Natural Resource Department:
Daily Environmental Monitoring Report

PHOTO LOG – 2023/01/11

PHOTO #1 – Sang bag placement at top of diversion channel



PHOTO #2 - East side of diversion channel before tree removal

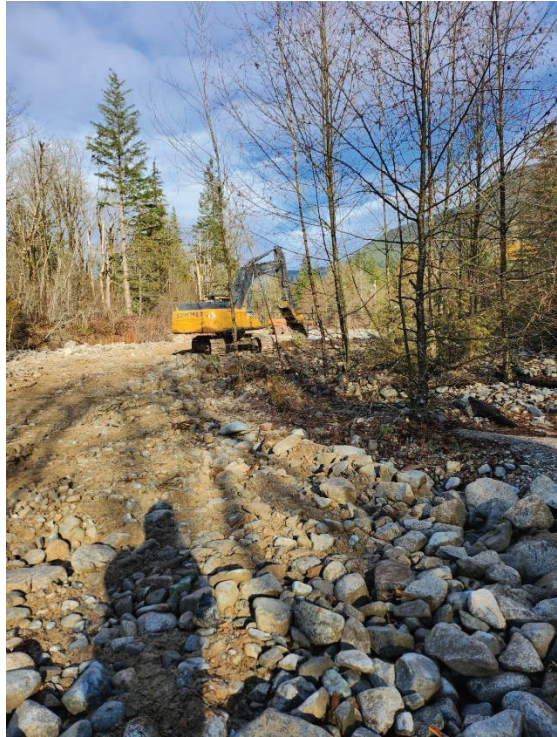


PHOTO #3 – East side of diversion channel after tree removal



PHOTO #4 – Lower reach of Pattison Creek(North facing), noted erosion point along east bank





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Natural Resource Department:
Daily Environmental Monitoring Report

Report Number:006		Location (Or Closest Address): Pattison Creek/Sylvester Road - Hatzic			
Date:2023-01-16	Time: 7:15AM-330PM				
Monitor Name: Jason Thompson		Signature:			
Meetings:					
Meeting Participants:					
Contractor(s) On Site: Summit Earthworks A&E Sartori		Name of Construction Representative Present:			
Weather Conditions (Cloud Cover, Wind, Precipitation, Temperature, etc.): 8°/3°, feels like 3°; Cloud cover, chance of light rain					
Ground Conditions: Dry ☐ Wet ☐ Saturated ☐					
Completed Construction Activities (Since Last Visit): Sand bag placement along proposed diversion channel; tree removal along proposed diversion channel and east bank erosion in prep for infill of east bank erosion, no visible turbidity during tree/root removal.					
Construction Activities: Bottom of diversion channel excavated with silt-fence installed above headwall; Electro-shock fish salvage of flood channel before opening top headwall to diversion channel; Removal of sandbags to allow creek diversion into new diversion channel.			Photos:		
Construction Equipment Being Used: CX2450 Excavator; 350G Excavator; 245 Excavator; DA 30 Rocktruck			Photos:		
Environmental Site Conditions (NC = Non-Compliant, NA = Not Applicable)					
Boundary Flagging	OK	NC	NA	Comments & Mitigation	Photos:
General Construction	X			Traffic control/flaggers and signage onsite	
Riparian Zone(s)			X		
Env. Sensitive Features			X		
Other					
Water Quality	OK	NC	NA	Comments & Mitigation	Photos:
Turbidity	X			Turbidity pulses during sandbag removal at top of headwall	
Temperature			X		
DO			X		
pH			X		
Conductivity			X		
Other					

Natural Resource Department: Daily Environmental Monitoring Report

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Daily Environmental Monitoring Report

PHOTO LOG – 2023/01/16

PHOTO #1 – Bottom of diversion channel and flood channel before sand bag removal, silt fence removed



PHOTO #2 - Initial sand bag removal at upper headwall



PHOTO #3 – Electro-fisher, seine net/fence and fish salvage equipment



PHOTO #4 – First pass with Electro-fisher in flood channel produced Coast Range Sculpin, Rainbow Trout, and Coho





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**Natural Resource Department:
 Daily Environmental Monitoring Report**

Report Number:007		Location (Or Closest Address): Pattison Creek/Sylvester Road - Hatzic			
Date:2023-01-17	Time: 7:15AM-12:00PM				
Monitor Name: Jason Thompson		Signature:			
Meetings:					
Meeting Participants:					
Contractor(s) On Site: Summit Earthworks A&E Sartori		Name of Construction Representative Present:			
Weather Conditions (Cloud Cover, Wind, Precipitation, Temperature, etc.): 8°/3°, feels like 3°; Cloud cover, chance of light rain					
Ground Conditions: Dry ☐ Wet ☐ Saturated ☐					
Completed Construction Activities (Since Last Visit): Bottom of diversion channel excavated with silt-fence installed above headwall; Electro-shock fish salvage of flood channel before opening top headwall to diversion channel; Removal of sandbags to allow creek diversion into new diversion channel.					
Construction Activities: Cont'd sand bag removal to allow full creek diversion into new diversion channel; Second day of Fish salvage in flood channel			Photos:		
Construction Equipment Being Used: CX2450 Excavator; 350G Excavator; 245 Excavator; DA 30 Rocktruck			Photos:		
Environmental Site Conditions (NC = Non-Compliant, NA = Not Applicable)					
Boundary Flagging	OK	NC	NA	Comments & Mitigation	Photos:
General Construction	X			Traffic control/flaggers and signage onsite	
Riparian Zone(s)			X		
Env. Sensitive Features			X		
Other					
Water Quality	OK	NC	NA	Comments & Mitigation	Photos:
Turbidity	X			Turbidity pulses during sandbag removal at top of headwall	
Temperature			X		
DO			X		
pH			X		
Conductivity			X		
Other					

**Natural Resource Department:
Daily Environmental Monitoring Report**

Erosion & Sediment Control	OK	NC	NA	Comments & Mitigation	Photos:
Silt Fencing	X			Silt-fence installed at bottom headwall	
Bank Stabilization	X			Boney material used to stabilize channel bank	
Soil Stockpiles			X		
Drainage & Diversions	X			Open of diversion channel top and bottom	
Detention Facilities			X		
Other					
Fuel & Oil Management	OK	NC	NA	Comments & Mitigation	Photos:
Spill Kits/SPER Plan	X			Spill trays in use; spill kits onsite	
Fuel Storage				No fuel storage seen onsite	
Other	X			Spill pads/kits on hand for refueling	
Equipment	OK	NC	NA	Comments & Mitigation	Photos:
Condition (leaks, etc.)	X			Equipment appears leak free	
Initial Cleaning (Mud, Seeds)	X			No visible signs of invasive vegetation	
Other					
Waste Management	OK	NC	NA	Comments & Mitigation	Photos:
Sanitary Facilities	X			Men/Women porto-potties onsite	
Solid Waste & Recycling	X			No refuse onsite; no waste/recycle containers onsite	
Special Waste & Hazardous Materials			X	No special/hazardous material seen onsite	
Other					
Atmosphere	OK	NC	NA	Comments & Mitigation	Photos:
Dust					
Air Quality					
Other					
Vegetation Management	OK	NC	NA	Comments & Mitigation	Photos:
Invasive Plants	X				
Other					
General Observations & Comments (Wildlife, New Sensitive Features, etc.): Const. Activity: Continued sandbag removal at upper headwall to allow for full creek diversion. Fuel/Waste: No visible sheen/spills throughout site, under machines or visible in spill trays					Photos:
Other Comments: Cultural Monitoring: Continues to be no visible signs of archeological or cultural heritage evidence; second day of fish salvage after 75%/25% creek diversion from flood channel to main channel produced a small amount of Sculpin, Rainbow Trout, and Coastal Tailed frog tadpoles. Upon discovery of tadpoles, salvage crew hand-salvaged/rock flipped for further sign of tadpoles. Final salvage complete and upper fish-fence removed for full creek diversion into new main channel.					Photos:
Upcoming Construction Events: 					
Incident Report Required? Yes ☐ No ☐					

Natural Resource Department:
Daily Environmental Monitoring Report

PHOTO LOG – 2023/01/17

PHOTO #1 – Sand bag removal completed at upper headwall for full creek diversion



PHOTO #2 - Flood channel after partial creek diversion on previous day

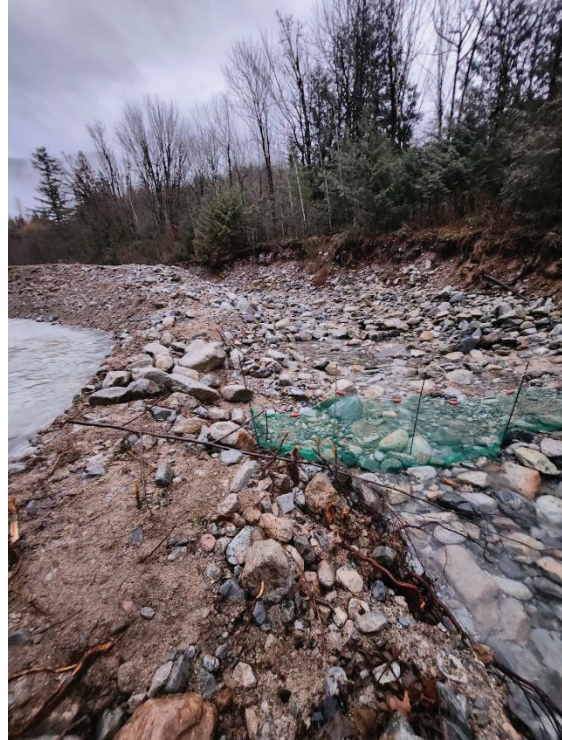


PHOTO #3 – Initial fish salvage on second day produced Sculpin, Rainbow Trout and Coastal Tailed frog tadpole



PHOTO #4 – Fish fence removed upstream of sandbags





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Natural Resource Department: Daily Environmental Monitoring Report

Report Number:		Location (Or Closest Address): Pattison Creek			
Date: Jan 26, 2022	Time: 2:30pm – 4:30pm				
Monitor Name: Rick McKamey		Signature: RJM			
Meetings:					
Meeting Participants:					
Contractor(s) On Site: AE inspector, Summit EarthWorks, Satori Environmental, Leqamel First Nation		Name of Construction Representative Present: Lorne AE, Geof Ratecliff supervisor (Summit Earthworks), Stephanie (Satori Environmental), Rick McKamey (LFN)			
Weather Conditions (Cloud Cover, Wind, Precipitation, Temperature, etc.): cloudy skies with precipitation					
Ground Conditions: Dry ☐ Wet ☒ Saturated ☐					
Completed Construction Activities (Since Last Visit):					
Construction Activities:			Photos:		
Opened flow to upper channel, continued bank hardening on west radius immediately down flow of the MoTi Bridge structure					
Construction Equipment Being Used: Case 245 excavator, John Deere 350 Excavator, three highway gravel trucks, Electroshock equipment for fish salvage activity			Photos:		
Environmental Site Conditions (NC = Non-Compliant, NA = Not Applicable)					
Boundary Flagging	OK	NC	NA	Comments & Mitigation	Photos:
General Construction	x			As per engineered plan	
Riparian Zone(s)	x			No alterations	
Env. Sensitive Features	x			Monitoring and deploying of fish salvage techniques with flow changes	
Other					
Water Quality	OK	NC	NA	Comments & Mitigation	Photos:
Turbidity	x			controlled	
Temperature					
DO					
pH					

Natural Resource Department: Daily Environmental Monitoring Report

Conductivity						
Other						
Erosion & Sediment Control	OK	NC	NA	Comments & Mitigation	Photos:	
Silt Fencing						
Bank Stabilization	x			Sand bags deflecting flow from excavation site and bank armor hardening being placed		
Soil Stockpiles						
Drainage & Diversions	x			Large sand bags instream to control stream channel		
Detention Facilities						
Other						
Fuel & Oil Management	OK	NC	NA	Comments & Mitigation	Photos:	
Spill Kits/SPER Plan	x			On site within required zone		
Fuel Storage	x			Contained in pickup fuel storage		
Other						
Equipment	OK	NC	NA	Comments & Mitigation	Photos:	
Condition (leaks, etc.)	x			Monitored consistently by ground crew		
Initial Cleaning (Mud, Seeds)	x			Not required as instream consistently		
Other						
Waste Management	OK	NC	NA	Comments & Mitigation	Photos:	
Sanitary Facilities	x			onsite		
Solid Waste & Recycling	x			Maintained by crews. All garbage taken out by individuals		
Special Waste & Hazardous Materials			x			
Other						
Atmosphere	OK	NC	NA	Comments & Mitigation	Photos:	
Dust			x			
Air Quality			x			
Other						
Vegetation Management	OK	NC	NA	Comments & Mitigation	Photos:	
Invasive Plants	x			No invasive species recognized		
Other						
General Observations & Comments (Wildlife, New Sensitive Features, etc.): Flow was diverted from to the new channel. A reduction of flow was observed to the west and mid channels causing need for fish salvage. Fish salvage was successful with only one mortality observed. Fish protective fencing was adjusted to meet the need and ensure no fish passage into the low flow channels. Turbidity was greatly minimized by the contractor supervisor observing and directing flow change within the stream and Satori Environmental consistent check of turbidity reading in stream. Tina Pederson (LFN Guardian coordinator) and I walked downstream to the confluence of the Legacy Creek and Pattison Creek observing no impacts due to the days work in sediment deposition. Flow below the project through to the Legacy Creek confluence remains in center channel and away from any erosion stress points.					Photos:	
Other Comments: No culturally significant observations recorded.					Photos:	

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Upcoming Construction Events:



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Incident Report Required?	Yes ☐	No ☒



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Natural Resource Department: Daily Environmental Monitoring Report

Report Number:		Location (Or Closest Address):			
Date: January 27, 2023	Time: 8 am to 4:30PM	Pattison Creek			
Monitor Name: Rick McKamey		Signature: RjM			
Meetings:					
Meeting Participants:					
Contractor(s) On Site: AE Inspector Satori Environmental Summit Earthworks LFN		Name of Construction Representative Present: Lorne (AE inspector) Stephanie (Satori Environmental) Geof Ratecliff (Summit Earthworks Supervisor) Rick McKamey (LFN)			
Weather Conditions (Cloud Cover, Wind, Precipitation, Temperature, etc.): Overcast with precipitation					
Ground Conditions: Dry ☐ Wet ☒ Saturated ☐					
Completed Construction Activities (Since Last Visit): Instream work completed.. Top bank work ongoing					
Construction Activities: Excavation and armor placement			Photos:		
Construction Equipment Being Used: Case 245 Excavator John Deere 350 excavator 3 highway gravel trucks Electro shock equipment			Photos:		
Environmental Site Conditions (NC = Non-Compliant, NA = Not Applicable)					
Boundary Flagging	OK	NC	NA	Comments & Mitigation	Photos:
General Construction	x			Instream excavation monitored close by Summit supervisor and Satori Enviro monitoring turbidity levels	
Riparian Zone(s)	x			Work was in a footprint in a riparian free footprint	
Env. Sensitive Features	x			Fish salvage efforts deployed with electro shock (Satori)	
Other					
Water Quality	OK	NC	NA	Comments & Mitigation	Photos:
Turbidity	x			Monitored by satori and Summit supervisor	
Temperature					
DO					

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pH					
Conductivity					
Other					
Erosion & Sediment Control	OK	NC	NA	Comments & Mitigation	Photos:
Silt Fencing			x		
Bank Stabilization	x			Large sandbags removed from instream and bank armor sealed up	
Soil Stockpiles	x			Sediment excavated fit into behind armor banks outside of riparian zone	
Drainage & Diversions	x			Diversion removed to bring flow to new channel without incident	
Detention Facilities					
Other					
Fuel & Oil Management	OK	NC	NA	Comments & Mitigation	Photos:
Spill Kits/SPER Plan	x			Onsite within work zone for easy access	
Fuel Storage	x			Stored in pickup containment tank	
Other					
Equipment	OK	NC	NA	Comments & Mitigation	Photos:
Condition (leaks, etc.)	x			Monitored by onsite works consistently	
Initial Cleaning (Mud, Seeds)	x			Not required as equipment remained in the footprint without incident	
Other					
Waste Management	OK	NC	NA	Comments & Mitigation	Photos:
Sanitary Facilities	x			On work site	
Solid Waste & Recycling	x			Garbage taken out by workers to dispose off site	
Special Waste & Hazardous Materials			x		
Other					
Atmosphere	OK	NC	NA	Comments & Mitigation	Photos:
Dust			x		
Air Quality			x		
Other					
Vegetation Management	OK	NC	NA	Comments & Mitigation	Photos:
Invasive Plants	x			No invasive species observed on site	
Other					
General Observations & Comments (Wildlife, New Sensitive Features, etc.): Final stream flow was diverted to the newly excavated channel. Once again a reduction of flow was observed to the west and mid channels causing need for fish salvage. Fish salvage was successful with no mortality observed. Fish protective fencing was removed to the low flow channels. Turbidity was greatly minimized by the contractor supervisor observing and directing flow change within the stream and Satori Environmental consistent check of turbidity reading in stream. All instream component of sediment removal was completed leaving only top bank finishing to complete project					Photos:
Other Comments: No significant cultural observations to record					Photos:

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Upcoming Construction Events:



Incident Report Required?

Yes ☐

No ☒



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Natural Resource Department: Daily Environmental Monitoring Report

Report Number:		Location (Or Closest Address):			
Date:	Time:	Pattison Creek			
January 29, 2023	4pm to 5pm				
Monitor Name: Rick McKamey		Signature: RjM			
Meetings:					
Meeting Participants:					
Contractor(s) On Site: LFN		Name of Construction Representative Present: Rick McKamey			
Weather Conditions (Cloud Cover, Wind, Precipitation, Temperature, etc.): overcast					
Ground Conditions: Dry ☐ Wet ☒ Saturated ☐					
Completed Construction Activities (Since Last Visit):					
Construction Activities: None, monitoring of flow as per call of an upslope slide event			Photos:		
Construction Equipment Being Used: none			Photos:		
Environmental Site Conditions (NC = Non-Compliant, NA = Not Applicable)					
Boundary Flagging	OK	NC	NA	Comments & Mitigation	Photos:
General Construction					
Riparian Zone(s)					
Env. Sensitive Features					
Other					
Water Quality	OK	NC	NA	Comments & Mitigation	Photos:
Turbidity					
Temperature					
DO					
pH					
Conductivity					
Other					

Natural Resource Department: Daily Environmental Monitoring Report

Erosion & Sediment Control	OK	NC	NA	Comments & Mitigation	Photos:
Silt Fencing					
Bank Stabilization					
Soil Stockpiles					
Drainage & Diversions					
Detention Facilities					
Other					
Fuel & Oil Management	OK	NC	NA	Comments & Mitigation	Photos:
Spill Kits/SPER Plan					
Fuel Storage					
Other					
Equipment	OK	NC	NA	Comments & Mitigation	Photos:
Condition (leaks, etc.)					
Initial Cleaning (Mud, Seeds)					
Other					
Waste Management	OK	NC	NA	Comments & Mitigation	Photos:
Sanitary Facilities					
Solid Waste & Recycling					
Special Waste & Hazardous Materials					
Other					
Atmosphere	OK	NC	NA	Comments & Mitigation	Photos:
Dust					
Air Quality					
Other					
Vegetation Management	OK	NC	NA	Comments & Mitigation	Photos:
Invasive Plants					
Other					
General Observations & Comments (Wildlife, New Sensitive Features, etc.): A call alerted LFN of a possible slide event in the upslope once again. An altered rise in daily flow and increased turbidity indicated a blockage upstream flow that released. The event flowed through similar to the previous weeks event. Photos indicate and evidence the caused alteration of flow and turbidity approx. 1 hour after it was first noted by a local resident. Short video footage is also available, I have filed this monitoring report to ensure the event is documented. Photo 1 is captured down flow of the MoTi Bridge structure and phot 2 shooting upstream of the MoTi bridge structure.					Photos:

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Other Comments:

Photos:

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Upcoming Construction Events:	
Incident Report Required? Yes ☐ No ☐	



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Natural Resource Department:
Daily Environmental Monitoring Report

Report Number:014				Location (Or Closest Address):	
Date:2023-01-30		Time: 7:00AM-2:30PM		Pattison Creek/Sylvester Road - Hatzic	
Monitor Name: Jason Thompson				Signature:	
Meetings:					
Meeting Participants:					
Contractor(s) On Site: Summit Earthworks A&E Sartori Hi-Tech Excavating & Demolition LTD				Name of Construction Representative Present:	
Weather Conditions (Cloud Cover, Wind, Precipitation, Temperature, etc.): 2°/-2°, Cloud cover w/rain					
Ground Conditions: Dry ☐ Wet ☒ Saturated ☐					
Completed Construction Activities (Since Last Visit): 350 Excavator cont'd upper diversion channel widening & rip rap placement; 245 Excavator cont'd sorting rip rap and gravel loads					
Construction Activities: 350 Excavator cont'd upper diversion channel widening & rip rap placement; 245 Excavator cont'd sorting rip rap and gravel loads					Photos:
Construction Equipment Being Used: 245 Excavator; (2-3) Gravel Trucks(<i>Hi-Tech Excavating</i>)					Photos:
Environmental Site Conditions (NC = Non-Compliant, NA = Not Applicable)					
Boundary Flagging	OK	NC	NA	Comments & Mitigation	Photos:
General Construction	X			Traffic control/flaggers and signage onsite	
Riparian Zone(s)			X		
Env. Sensitive Features			X		
Other					
Water Quality	OK	NC	NA	Comments & Mitigation	Photos:
Turbidity			X	Pulse of turbid water around 2:15pm, no instream works	
Temperature			X		
DO			X		
pH			X		
Conductivity			X		
Other					

**Natural Resource Department:
Daily Environmental Monitoring Report**

Erosion & Sediment Control	OK	NC	NA	Comments & Mitigation	Photos:
Silt Fencing			X		
Bank Stabilization	X			Final rip rap placement armor at bend below bridge	
Soil Stockpiles			X		
Drainage & Diversions			X		
Detention Facilities			X		
Other					
Fuel & Oil Management	OK	NC	NA	Comments & Mitigation	Photos:
Spill Kits/SPER Plan	X			Spill trays in use; spill kits onsite	
Fuel Storage				No fuel storage seen onsite	
Other	X				
Equipment	OK	NC	NA	Comments & Mitigation	Photos:
Condition (leaks, etc.)	X			Equipment appears leak free	
Initial Cleaning (Mud, Seeds)	X			No visible signs of invasive vegetation	
Other					
Waste Management	OK	NC	NA	Comments & Mitigation	Photos:
Sanitary Facilities	X			Men/Women porto-potties onsite	
Solid Waste & Recycling	X			No refuse onsite; no waste/recycle containers onsite	
Special Waste & Hazardous Materials			X	No special/hazardous material seen onsite	
Other					
Atmosphere	OK	NC	NA	Comments & Mitigation	Photos:
Dust					
Air Quality					
Other					
Vegetation Management	OK	NC	NA	Comments & Mitigation	Photos:
Invasive Plants	X				
Other					
General Observations & Comments (Wildlife, New Sensitive Features, etc.): Const. Activity: See Page 1; 350 Excavator previously removed from site Fuel/Waste: No visible sheen/spills throughout site, under machines or visible in spill trays belonging to Summit equipment and vehicles.					Photos:
Other Comments: Cultural Monitoring: Continues to be no visible signs of archeological or cultural heritage evidence; No visible signs of fish in diversion channel during activities on this date					Photos:
Upcoming Construction Events:					
Incident Report Required? Yes ☐ No ☐					

Natural Resource Department:
Daily Environmental Monitoring Report

PHOTO LOG – 2023/01/30

PHOTO #1 – 245 Excavator final rip rap placement



PHOTO #2 - Hi-Tech trucking delivering rip rap



PHOTO #3 – Channel widened below bridge and rip rap armored



PHOTO #4 – Sang bags stockpiled for removal; lockblocks onsite ready for placement





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Natural Resource Department:
Daily Environmental Monitoring Report

Report Number:015		Location (Or Closest Address): Pattison Creek/Sylvester Road - Hatzic			
Date:2023-01-31	Time: 7:45AM-10:30PM				
Monitor Name: Jason Thompson		Signature:			
Meetings:					
Meeting Participants:					
Contractor(s) On Site: Summit Earthworks A&E Hi-Tech Excavating & Demolition LTD		Name of Construction Representative Present:			
Weather Conditions (Cloud Cover, Wind, Precipitation, Temperature, etc.): 2°/-2°, Cloud cover w/mixed rain & snow					
Ground Conditions: Dry ☐ Wet ☒ Saturated ☐					
Completed Construction Activities (Since Last Visit): 350 Excavator cont'd upper diversion channel widening & rip rap placement; 245 Excavator cont'd sorting rip rap and gravel loads					
Construction Activities: No instream works due to weather conditions and previous day's concern of turbid water and slides in upper reach; 245 Excavator loading sandbags and porto-potties for removal, and lockblock placement to deter public access			Photos:		
Construction Equipment Being Used: 245 Excavator			Photos:		
Environmental Site Conditions (NC = Non-Compliant, NA = Not Applicable)					
Boundary Flagging	OK	NC	NA	Comments & Mitigation	Photos:
General Construction			X	No flaggers onsite this day	
Riparian Zone(s)			X		
Env. Sensitive Features			X		
Other					
Water Quality	OK	NC	NA	Comments & Mitigation	Photos:
Turbidity			X	Creek visibly clear of turbidity	
Temperature			X		
DO			X		
pH			X		
Conductivity			X		
Other					

**Natural Resource Department:
Daily Environmental Monitoring Report**

Erosion & Sediment Control	OK	NC	NA	Comments & Mitigation	Photos:
Silt Fencing			X	Silt fencing loaded for removal	
Bank Stabilization	X			Final rip rap placement armor at bend below bridge	
Soil Stockpiles			X	Sandbags loaded for removal	
Drainage & Diversions			X		
Detention Facilities			X		
Other					
Fuel & Oil Management	OK	NC	NA	Comments & Mitigation	Photos:
Spill Kits/SPER Plan	X			Spill trays in use; spill kits onsite; ready for removal	
Fuel Storage				No fuel storage seen onsite	
Other	X				
Equipment	OK	NC	NA	Comments & Mitigation	Photos:
Condition (leaks, etc.)	X			Equipment appears leak free	
Initial Cleaning (Mud, Seeds)	X			No visible signs of invasive vegetation	
Other					
Waste Management	OK	NC	NA	Comments & Mitigation	Photos:
Sanitary Facilities	X			porto-potties loaded for removal	
Solid Waste & Recycling	X			Refuse bag loaded for removal	
Special Waste & Hazardous Materials			X	No special/hazardous material seen onsite	
Other					
Atmosphere	OK	NC	NA	Comments & Mitigation	Photos:
Dust					
Air Quality					
Other					
Vegetation Management	OK	NC	NA	Comments & Mitigation	Photos:
Invasive Plants	X				
Other					
General Observations & Comments (Wildlife, New Sensitive Features, etc.): Const. Activity: See Page 1; 245 Excavator loaded sangbags into Hi-Tech dump truck for removal; Moved porto-potties to roadside for pickup; lockblocks placed at site access road to deter public access into the creek Fuel/Waste: No visible sheen/spills throughout site, under machines or visible in spill trays belonging to Summit equipment and vehicles.					Photos:
Other Comments: Cultural Monitoring: Continues to be no visible signs of archeological or cultural heritage evidence; No visible signs of fish in diversion channel during activities on this date					Photos:
Upcoming Construction Events: 					
Incident Report Required? Yes ☐ No ☐					

Natural Resource Department:
Daily Environmental Monitoring Report

PHOTO LOG – 2023/01/31

PHOTO #1 – 245 Excavator loading sandbags for removal



PHOTO #2 - Porto-potties placed at roadside for pickup



PHOTO #3 – Lockblocks placed on and adjacent to road access



PHOTO #4 – Site equipment, spill kits, signage loaded for removal





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Natural Resource Department:
Daily Environmental Monitoring Report

Report Number:008		Location (Or Closest Address): Pattison Creek/Sylvester Road - Hatzic			
Date:2023-01-19	Time: 8:00AM-2:30PM				
Monitor Name: Jason Thompson		Signature:			
Meetings:					
Meeting Participants:					
Contractor(s) On Site: Summit Earthworks A&E Sartori		Name of Construction Representative Present:			
Weather Conditions (Cloud Cover, Wind, Precipitation, Temperature, etc.): 8°/1°, Cloud cover, chance of light rain					
Ground Conditions: Dry ☐ Wet ☐ Saturated ☐					
Completed Construction Activities (Since Last Visit): Rip rap installation along east bank of diversion channel, and infilling of east bank/erosion channel					
Construction Activities: (1)Rock truck and (1) excavator loaded and removed from site; cont'd widening and armoring of diversion channel. (2) excavators crossed stream to east bank for armoring and diversion channel widening			Photos:		
Construction Equipment Being Used: 350G Excavator; 245 Excavator			Photos:		
Environmental Site Conditions (NC = Non-Compliant, NA = Not Applicable)					
Boundary Flagging	OK	NC	NA	Comments & Mitigation	Photos:
General Construction	X			Traffic control/flaggers and signage onsite	
Riparian Zone(s)			X		
Env. Sensitive Features			X		
Other					
Water Quality	OK	NC	NA	Comments & Mitigation	Photos:
Turbidity	X			Turbidity pulses during widening of diversion channel	
Temperature			X		
DO			X		
pH			X		
Conductivity			X		
Other					

**Natural Resource Department:
Daily Environmental Monitoring Report**

Erosion & Sediment Control	OK	NC	NA	Comments & Mitigation	Photos:
Silt Fencing			X		
Bank Stabilization	X			Boney material used to stabilize east bank infill slope	
Soil Stockpiles			X		
Drainage & Diversions			X		
Detention Facilities			X		
Other					
Fuel & Oil Management	OK	NC	NA	Comments & Mitigation	Photos:
Spill Kits/SPER Plan	X			Spill trays in use; spill kits onsite	
Fuel Storage				No fuel storage seen onsite	
Other	X			Spill pads/kits on hand for refueling	
Equipment	OK	NC	NA	Comments & Mitigation	Photos:
Condition (leaks, etc.)	X			Equipment appears leak free	
Initial Cleaning (Mud, Seeds)	X			No visible signs of invasive vegetation	
Other					
Waste Management	OK	NC	NA	Comments & Mitigation	Photos:
Sanitary Facilities	X			Men/Women porto-potties onsite	
Solid Waste & Recycling	X			No refuse onsite; no waste/recycle containers onsite	
Special Waste & Hazardous Materials			X	No special/hazardous material seen onsite	
Other					
Atmosphere	OK	NC	NA	Comments & Mitigation	Photos:
Dust					
Air Quality					
Other					
Vegetation Management	OK	NC	NA	Comments & Mitigation	Photos:
Invasive Plants	X				
Other					
General Observations & Comments (Wildlife, New Sensitive Features, etc.): Const. Activity: See Page 1; Drone flight took place to determine status of creek and sediment source upstream Fuel/Waste: No visible sheen/spills throughout site, under machines or visible in spill trays					Photos:
Other Comments: Cultural Monitoring: Continues to be no visible signs of archeological or cultural heritage evidence; No visible signs of fish in diversion channel during activities on this date					Photos:
Upcoming Construction Events: 					
Incident Report Required? Yes ☐ No ☐					

Natural Resource Department:
Daily Environmental Monitoring Report

PHOTO LOG – 2023/01/19

PHOTO #1 – Doosan Rock Truck loaded for removal from site



PHOTO #2 - Excavators armoring along diversion channel on east bank



PHOTO #3 – Excavator sorting rip rap below bridge



PHOTO #4 – Water meter placed below bridge to observe water level





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Natural Resource Department:
Daily Environmental Monitoring Report

Report Number:010		Location (Or Closest Address): Pattison Creek/Sylvester Road - Hatzic			
Date:2023-01-20	Time: 8:00AM-2:30PM				
Monitor Name: Jason Thompson		Signature:			
Meetings:					
Meeting Participants:					
Contractor(s) On Site: Summit Earthworks A&E Sartori		Name of Construction Representative Present:			
Weather Conditions (Cloud Cover, Wind, Precipitation, Temperature, etc.): 6°/1°, Cloud cover w/fog; chance of light rain					
Ground Conditions: Dry ☐ Wet ☒ Saturated ☐					
Completed Construction Activities (Since Last Visit): (1)Rock truck and (1) excavator loaded and removed from site; cont'd widening and armoring of diversion channel. (2) excavators crossed stream to east bank for armoring and diversion channel widening					
Construction Activities: 245 Excavator sorting rip rap; 350 Excavator cont'd channel widening, sand bag placement to allow more flow into diversion channel, armoring of westbank erosion points			Photos:		
Construction Equipment Being Used: 350G Excavator; 245 Excavator			Photos:		
Environmental Site Conditions (NC = Non-Compliant, NA = Not Applicable)					
Boundary Flagging	OK	NC	NA	Comments & Mitigation	Photos:
General Construction	X			Traffic control/flaggers and signage onsite	
Riparian Zone(s)			X		
Env. Sensitive Features			X		
Other					
Water Quality	OK	NC	NA	Comments & Mitigation	Photos:
Turbidity	X			Turbidity pulses during widening of diversion channel	
Temperature			X		
DO			X		
pH			X		
Conductivity			X		
Other					

Natural Resource Department: Daily Environmental Monitoring Report

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Natural Resource Department:
Daily Environmental Monitoring Report

PHOTO LOG – 2023/01/120

PHOTO #1 – 350 beginning work at top of diversion channel;
245 sorting rip rap



PHOTO #2 - Small rock weir under silt fencing, with
waterpump to minimize turbid water

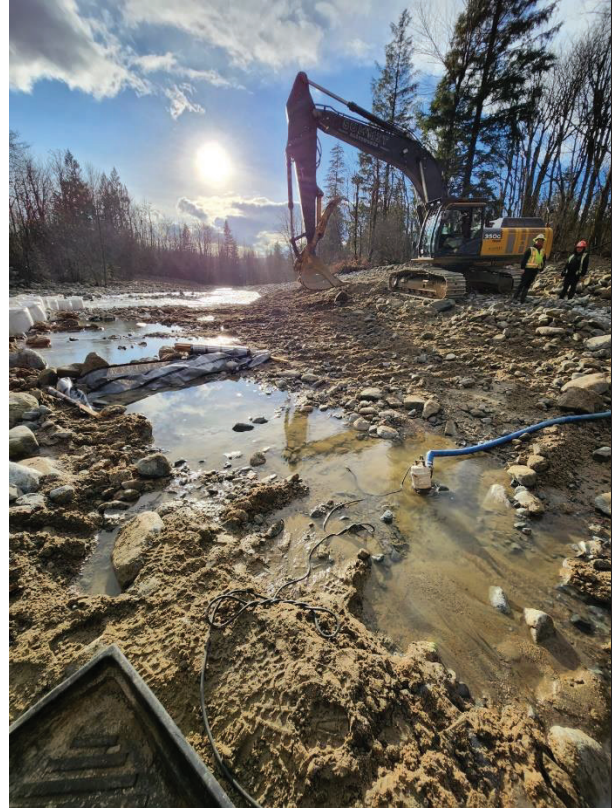


PHOTO #3 – Pulse of turbid water during channel widening
and sand bag removal



PHOTO #4 –Small amount of flow still wetted after east
bank infill (South facing, below bottom of diversion channel)



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Daily Environmental Monitoring Report



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Natural Resource Department:
Daily Environmental Monitoring Report

Report Number:011		Location (Or Closest Address): Pattison Creek/Sylvester Road - Hatzic			
Date:2023-01-23	Time: 7:30AM-3:10PM				
Monitor Name: Jason Thompson		Signature:			
Meetings:					
Meeting Participants:					
Contractor(s) On Site: Summit Earthworks A&E Sartori Hi-Tech Excavating & Demolition LTD		Name of Construction Representative Present:			
Weather Conditions (Cloud Cover, Wind, Precipitation, Temperature, etc.): 4°/2°, Cloud cover w/fog; chance of light rain & mixed snow					
Ground Conditions: Dry ☐ Wet ☒ Saturated ☐					
Completed Construction Activities (Since Last Visit): 245 Excavator sorting rip rap; 350 Excavator cont'd channel widening, sand bag placement to allow more flow into diversion channel, armoring of westbank erosion points					
Construction Activities: 350 Excavator cont'd upper diversion channel widening; 245 Excavator cont'd sorting rip rap and gravel loads			Photos:		
Construction Equipment Being Used: 350G Excavator; 245 Excavator; (2) Gravel Trucks(<i>Hi-Tech Excavating</i>)			Photos:		
Environmental Site Conditions (NC = Non-Compliant, NA = Not Applicable)					
Boundary Flagging	OK	NC	NA	Comments & Mitigation	Photos:
General Construction	X			Traffic control/flaggers and signage onsite	
Riparian Zone(s)			X		
Env. Sensitive Features			X		
Other					
Water Quality	OK	NC	NA	Comments & Mitigation	Photos:
Turbidity	X			Minimal turbidity; waterpump in use to minimize	
Temperature			X		
DO			X		
pH			X		
Conductivity			X		
Other					

**Natural Resource Department:
Daily Environmental Monitoring Report**

Erosion & Sediment Control	OK	NC	NA	Comments & Mitigation	Photos:
Silt Fencing			X		
Bank Stabilization	X			Boney material used to stabilize westbank erosion	
Soil Stockpiles			X		
Drainage & Diversions	X				
Detention Facilities			X		
Other					
Fuel & Oil Management	OK	NC	NA	Comments & Mitigation	Photos:
Spill Kits/SPER Plan	X			Spill trays in use; spill kits onsite	
Fuel Storage				No fuel storage seen onsite	
Other	X	X		One dump truck dismissed due to oil leak	
Equipment	OK	NC	NA	Comments & Mitigation	Photos:
Condition (leaks, etc.)	X			Equipment appears leak free	
Initial Cleaning (Mud, Seeds)	X			No visible signs of invasive vegetation	
Other					
Waste Management	OK	NC	NA	Comments & Mitigation	Photos:
Sanitary Facilities	X			Men/Women porto-potties onsite	
Solid Waste & Recycling	X			No refuse onsite; no waste/recycle containers onsite	
Special Waste & Hazardous Materials			X	No special/hazardous material seen onsite	
Other					
Atmosphere	OK	NC	NA	Comments & Mitigation	Photos:
Dust					
Air Quality					
Other					
Vegetation Management	OK	NC	NA	Comments & Mitigation	Photos:
Invasive Plants	X				
Other					
General Observations & Comments (Wildlife, New Sensitive Features, etc.): Const. Activity: See Page 1; Generator pump used to divert minimal turbid water into riparian area beyond west bank. 350 Excavator armored west bank along diversion channel with rip rap, and boney/boulder material on east bank nose point. 245 Excavator cont'd to sort rip rap, and extended sand bag placement below bridge. Fuel/Waste: No visible sheen/spills throughout site, under machines or visible in spill trays belonging to Summit equipment and vehicles. (1) Hi-Tech Excavating dump truck was dismissed due to oil leaks visible on Sylvester Road Bridge, and into site access road.					Photos:
Other Comments: Cultural Monitoring: Continues to be no visible signs of archeological or cultural heritage evidence; No visible signs of fish in diversion channel during activities on this date					Photos:
Upcoming Construction Events:					
Incident Report Required? Yes ☐ No ☐					

Natural Resource Department:
Daily Environmental Monitoring Report

PHOTO LOG – 2023/01/23

PHOTO #1 – Spill trays in use onsite



PHOTO #2 - 350 widening diversion channel, boulder placement on east bank, rip rap on west bank

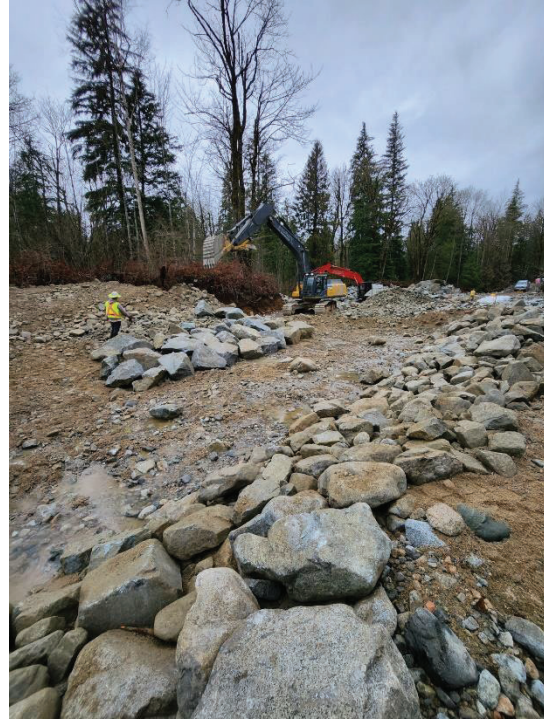


PHOTO #3 – 245 extending sand bag placement below bridge



PHOTO #4 – Oil leak visible immediately after dump truck delivery





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Natural Resource Department:
Daily Environmental Monitoring Report

Report Number:012		Location (Or Closest Address): Pattison Creek/Sylvester Road - Hatzic			
Date:2023-01-24	Time: 7:30AM-1:30PM				
Monitor Name: Jason Thompson		Signature:			
Meetings:					
Meeting Participants:					
Contractor(s) On Site: Summit Earthworks A&E Sartori Hi-Tech Excavating & Demolition LTD		Name of Construction Representative Present:			
Weather Conditions (Cloud Cover, Wind, Precipitation, Temperature, etc.): 4°/2°, Cloud cover w/rain					
Ground Conditions: Dry ☐ Wet ☒ Saturated ☐					
Completed Construction Activities (Since Last Visit): 350 Excavator cont'd upper diversion channel widening; 245 Excavator cont'd sorting rip rap and gravel loads					
Construction Activities: 350 Excavator cont'd upper diversion channel widening & rip rap placement; 245 Excavator cont'd sorting rip rap and gravel loads			Photos:		
Construction Equipment Being Used: 350G Excavator; 245 Excavator; (2) Gravel Trucks(<i>Hi-Tech Excavating</i>)			Photos:		
Environmental Site Conditions (NC = Non-Compliant, NA = Not Applicable)					
Boundary Flagging	OK	NC	NA	Comments & Mitigation	Photos:
General Construction	X			Traffic control/flaggers and signage onsite	
Riparian Zone(s)			X		
Env. Sensitive Features			X		
Other					
Water Quality	OK	NC	NA	Comments & Mitigation	Photos:
Turbidity	X			Minimal turbidity; waterpump in use to minimize	
Temperature			X		
DO			X		
pH			X		
Conductivity			X		
Other					

**Natural Resource Department:
Daily Environmental Monitoring Report**

Erosion & Sediment Control	OK	NC	NA	Comments & Mitigation	Photos:
Silt Fencing			X		
Bank Stabilization	X			Boney material used to stabilize westbank erosion	
Soil Stockpiles			X		
Drainage & Diversions	X				
Detention Facilities			X		
Other					
Fuel & Oil Management	OK	NC	NA	Comments & Mitigation	Photos:
Spill Kits/SPER Plan	X			Spill trays in use; spill kits onsite	
Fuel Storage				No fuel storage seen onsite	
Other	X				
Equipment	OK	NC	NA	Comments & Mitigation	Photos:
Condition (leaks, etc.)	X			Equipment appears leak free	
Initial Cleaning (Mud, Seeds)	X			No visible signs of invasive vegetation	
Other					
Waste Management	OK	NC	NA	Comments & Mitigation	Photos:
Sanitary Facilities	X			Men/Women porto-potties onsite	
Solid Waste & Recycling	X			No refuse onsite; no waste/recycle containers onsite	
Special Waste & Hazardous Materials			X	No special/hazardous material seen onsite	
Other					
Atmosphere	OK	NC	NA	Comments & Mitigation	Photos:
Dust					
Air Quality					
Other					
Vegetation Management	OK	NC	NA	Comments & Mitigation	Photos:
Invasive Plants	X				
Other					
General Observations & Comments (Wildlife, New Sensitive Features, etc.): Const. Activity: See Page 1; Generator pump used to divert minimal turbid water into riparian area beyond west bank. 350 Excavator armored west bank along diversion channel with rip rap, and boney/boulder material on east bank nose point. 245 Excavator cont'd to sort rip rap, and extended sand bag placement below bridge. Fuel/Waste: No visible sheen/spills throughout site, under machines or visible in spill trays belonging to Summit equipment and vehicles.					Photos:
Other Comments: Cultural Monitoring: Continues to be no visible signs of archeological or cultural heritage evidence; No visible signs of fish in diversion channel during activities on this date					Photos:
Upcoming Construction Events:					
Incident Report Required? Yes ☐ No ☐					

Natural Resource Department:
Daily Environmental Monitoring Report

PHOTO LOG – 2023/01/24

PHOTO #1 – 350 Excavator armoring west bank and digging diversion channel, spill tray on hand



PHOTO #2 - 350 & 245 Excavators placing/sorting rip rap and gravel deliveries



PHOTO #3 – Water pump on hand to disburse turbid water into riparian area

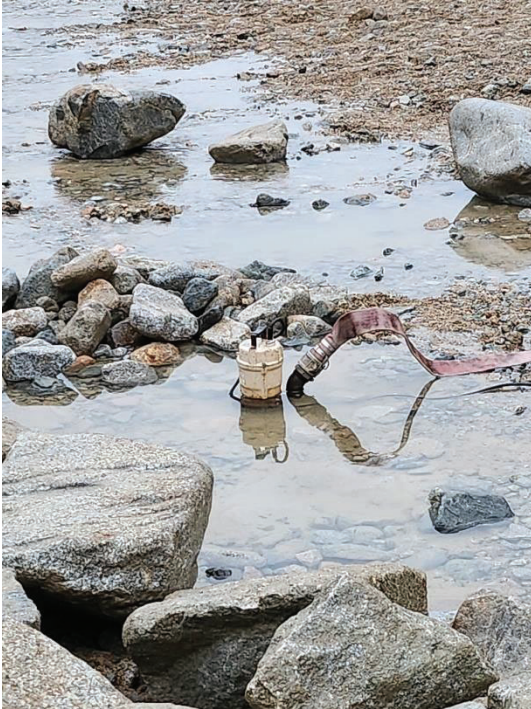


PHOTO #4 – Fuel and generator sitting in spill tray adjacent to wetted diversion channel





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Natural Resource Department:
Daily Environmental Monitoring Report

Report Number:013		Location (Or Closest Address): Pattison Creek/Sylvester Road - Hatzic			
Date:2023-01-25	Time: 7:00AM-2:30PM				
Monitor Name: Jason Thompson		Signature:			
Meetings:					
Meeting Participants:					
Contractor(s) On Site: Summit Earthworks A&E Sartori Hi-Tech Excavating & Demolition LTD		Name of Construction Representative Present:			
Weather Conditions (Cloud Cover, Wind, Precipitation, Temperature, etc.): 4°/2°, Cloud cover w/rain					
Ground Conditions: Dry ☐ Wet ☒ Saturated ☐					
Completed Construction Activities (Since Last Visit): 350 Excavator cont'd upper diversion channel widening & rip rap placement; 245 Excavator cont'd sorting rip rap and gravel loads					
Construction Activities: 350 Excavator cont'd upper diversion channel widening & rip rap placement; 245 Excavator cont'd sorting rip rap and gravel loads			Photos:		
Construction Equipment Being Used: 350G Excavator; 245 Excavator; (2) Gravel Trucks(<i>Hi-Tech Excavating</i>)			Photos:		
Environmental Site Conditions (NC = Non-Compliant, NA = Not Applicable)					
Boundary Flagging	OK	NC	NA	Comments & Mitigation	Photos:
General Construction	X			Traffic control/flaggers and signage onsite	
Riparian Zone(s)			X		
Env. Sensitive Features			X		
Other					
Water Quality	OK	NC	NA	Comments & Mitigation	Photos:
Turbidity	X			Minimal turbidity; waterpump in use to minimize	
Temperature			X		
DO			X		
pH			X		
Conductivity			X		
Other					

Natural Resource Department: Daily Environmental Monitoring Report

[illegible]

Natural Resource Department:
Daily Environmental Monitoring Report

PHOTO LOG – 2023/01/25

PHOTO #1 – 350 Excavator placing rip rap; 245 Excavator working behind sand bags; gravel truck rip rap delivery



PHOTO #2 - Channel peeled back by 245 Excavator below bridge



PHOTO #3 – Water pump on hand to disburse turbid water into riparian area; fuel/generator in spill tray



PHOTO #4 – Spill tray under parked 245 Excavator

