

## **Exchamsiks Fish Ladder Repairs Construction Summary Report**

The Exchamsiks fish ladder provides access to fish from the Skeena River to an extensive backchannel complex adjacent to the Exchamsiks River, west of Terrace, BC. The fish ladder was installed on a culvert running under the CN Rail line and Highway 16 in 2008 by DFO Resource Restoration Unit staff, in collaboration with the Skeena Fisheries Commission. Over time, the boxes have shifted, affecting the jump heights of each structure, and in some cases the seal between the boxes has been compromised.

The Canadian Wildlife Federation completed designs and coordinated construction for fishway repairs with funding from the BC Salmon Restoration and Innovation Fund and in-kind support from DFO Resource Restoration Unit Smithers staff. The work entailed removing the fish ladder boxes from their base, cleaning debris from them, re-grouting the bases of the boxes, and reinstalling and re-sealing the boxes to their intended alignment and jump heights. In addition, the inlet of the culvert under CN Rail and Highway 16 was cleared of debris as part of the work.

Work was completed by Progressive Ventures Ltd., with support from DFO Resource Restoration Unit Smithers staff, and environmental monitoring services were provided by Khtada Enterprises Ltd. (a division of Triton Environmental). Additional First Nation monitoring was provided by Kitsumkalum First Nation. Work commenced on February 21, 2024 and was completed on March 7, 2024.

The timing was chosen to coincide with low water in the Skeena River. At the time, the ladder was naturally dry, and all but the lowest two boxes of the ladder were able to be removed in the dry, with no need for site isolation or fish salvage. The lowest two boxes remain wetted year-round, so it was decided by DFO staff that these boxes should remain in place, as they will not affect the function of the structure. Boxes were taken off site to the Progressive Ventures works yard for cleaning and grouting, where they were left to cure prior to being returned to site and reinstalled. Photos of the Exchamsiks fishway prior to repair are included in the Exchamsiks Fishway Repair Prescription prepared by McElhanney (Appendix 1). A summary of construction project activities, including site photos during and following construction are included in the daily construction monitoring reports prepared by Khtada, Kitsumkalum and DFO (Appendix 2).

# Appendix 1.

## Exchamsiks Fishway Repair Prescription

13 May 2022

Canadian Wildlife Federation  
[www.CanadianWildlifeFederation.ca](http://www.CanadianWildlifeFederation.ca)

Attention: Betty Rebellato, National Fish Passage Improvement Coordinator

## Re: Exchamsiks Fishway Repair Prescription

McElhanney Ltd. (McElhanney) was contracted on behalf of the Canadian Wildlife Federation, to conduct an assessment and repair prescription of the Exchamsiks Fishway west of Terrace BC.

Site visits were conducted on October 28, 2021, by Chris Houston and December 16, 2021, by Chris Houston and Rob Phillips of McElhanney.

The following is a summary of the findings during the site visits and the bases of the design prescriptions.

### Fish Ladder Notes and Repair Prescriptions

After review of the fish ladder, it appears that the individual boxes have shifted positions, causing gaps to form between the boxes (see photo 3, 8 & 11). The overall location of the ladder does not appear to have changed. Large amounts of material around the boxes have been eroding away causing large gaps between the concrete boxes and the adjacent ground (see photo 3 & 4). The material under the culvert into the ladder has been completely eroded away causing the pipe to be suspended between the road fill material and the concrete boxes. It is recommended to disconnect the boxes from each other (see photo 12 for bolt connection) and lift the individual boxes out of the way in order to re-establish the base materials. Since the overall elevation of the boxes doesn't appear to have changed much it is assumed the support rails under the boxes are still in good condition and have not moved. Therefore, only the base material will only require repair, but a review of the rails and base should be inspected to confirm this upon removal of the boxes. Upon re-installing the boxes, Con Seal CS-102 Butyl Rubber (product information is attached) sealant (or approved fish friendly equivalent) should be placed on all joints prior re-bolting the boxes securely together. After the boxes have been put back into place, they should be backfilled with an approved granular material to match the existing ground with a minimum 2% grade away from the boxes to reduce the potential for additional erosion. Care should be taken when backfilling around the culvert to ensure that compacted material is established underneath the pipe. Within the locations that the backfill is within the water, Class 50 kg riprap should be used to prevent erosion specifically in the location of the left side of section B on the drawings between the boxes and the railway grade, as depicted in photo 10 where water continues to flow during low flow periods.

### McElhanney

1 – 5008 Pohle Avenue, Terrace BC Canada, V8G 4S8  
Tel. 250-635-7163 | Toll Free. 1-866-635-7163 | Fax. 1-855-407-3895 | [www.mcelhanney.com](http://www.mcelhanney.com)

Based on the two site visits, it was noted that during higher water a substantial flow was flowing through the ladder but during lower water events the level of the upstream pond is lower than the inlet of the ladder and therefore no water was flowing through the ladder. The above pond water was flowing through the riprap under the road/tracks (see photo 10) and draining the pond below the inlet of the culvert. This situation was not remediated during this repair and therefore the ladder will continue to only be operational during higher flow seasons. During low flow times when water isn't passing through the culvert the ladder boxes are drained via the drain hole (see photo 9) and therefore will not trap fish within the boxes or freeze causing damage to the boxes. Bottom contouring of the boxes with a non-expanding grout would assist with ensuring that the fish don't get trapped within the corners of the boxes.

During the inspection it was noted that some degradation has occurred to the asphalt road section within this area, a detailed review this was not part of the scope, and therefore no work is proposed to be completed for the culvert section under the road.

The inlet of the culvert upstream of the ladder is clogged and filled with debris (see photo 5); this debris will require removal to ensure that water can freely flow through the pipe. The protective grate appears to be lifted (see photo 6) and may not be protecting the inlet of the culvert from debris. Although this was difficult to tell during the inspection but once it is cleaned it should be inspected to confirm that the grate is covering the inlet of the culvert. If debris has managed to enter the pipe, additional care should be taken to ensure that all debris is removed from inside the pipe. An additional debris protector is recommended that is located upstream of the existing boulder deflector to assist with catchment of the larger debris. This protector should be connected to the existing riprap outcropping and constructed to match the road elevation in order to maximize the protection.

Repair prescriptions can be found on the attached C-100 drawing.

The following table is an estimate of the granular materials required to complete the prescriptions based on information collected on site.

| Table of Quantities        |                    |
|----------------------------|--------------------|
| Granular Base Material     | 2.5 m <sup>3</sup> |
| Approved Backfill Material | 15 m <sup>3</sup>  |
| Riprap Backfill Material   | 10 m <sup>3</sup>  |



## Photo Table with Descriptions



*Photo 1 - Upstream View*



*Photo 2 - Culvert Outlet View*



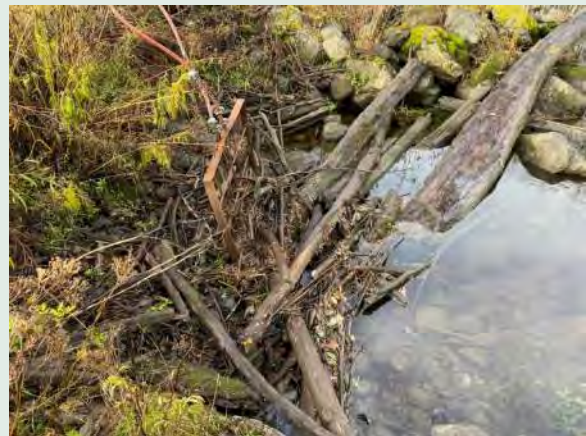
*Photo 3 - Ladder View Depicting the Displacement*



*Photo 4 - Eroded Fill Adjacent to Boxes*



*Photo 5 - Upstream Debris*



*Photo 6 - Upstream Debris, gate appears open.*

## Photo Table with Descriptions



*Photo 7 - Road Damage*



*Photo 8 - Displacement between Boxes*



*Photo 9 - Box Drain Hole*



*Photo 10 - Flow through the Riprap in Low Water*



*Photo 11 - Amount of Box Displacement*



*Photo 12 - Connection Bolts*

## Photo Table with Descriptions



*Photo 13 - Erosion under the pipe*



*Photo 4 - Erosion between rail riprap and fishway*

McElhanney ANS D - 2012-05-11  
DATE: 2022-05-05, 15:46 FILE: C:\2022\02060\2022-05-05-00\Externals\Fishway\100 Drawings\102 Engineering\103.1 Sheet\222-02060-00 C-EXCHAMSIKS FISHWAY.dwg  
Rev 0 2022-05-05 ISSUED FOR CONSTRUCTION JD CH CH Draw Design App'd

GENERAL NOTES

- CHECK AND VERIFY ALL DIMENSIONS BEFORE COMMENCING ANY WORK.
- NOTIFY THE DESIGNER OF ANY ERRORS OR OMISSIONS.
- ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE STATED.
- DRAWINGS SHALL NOT BE USED FOR CONSTRUCTION UNLESS MARKED "ISSUED FOR CONSTRUCTION" AND SEALED BY A PROFESSIONAL ENGINEER.
- CONTRACTOR SHALL OBTAIN ALL REQUIRED PERMITS AND AUTHORIZATIONS TO CROSS THE RAIL TRACKS WITH THEIR EQUIPMENT AND MATERIALS AND CONDUCT THE WORKS WITHIN ON RIGHT OF WAY.
- LOCATIONS OF UNDER GROUND UTILITIES SHOWN ON PLAN ARE APPROXIMATE ONLY. INFORMATION MAY NOT BE COMPLETE OR ACCURATE. CONTRACTOR SHALL EXPOSE LOCATIONS OF ALL EXISTING UTILITIES AND ADVISE THE ENGINEER OF POTENTIAL CONFLICTS.
- ALL BASE MATERIAL AND SUBBASE MATERIAL GRADATION SIZE AS PER TABLE BELOW:

| 19mm GRANULAR BASE GRADATION TABLE |                |
|------------------------------------|----------------|
| SIEVE SIZE (mm)                    | GRADING FILL % |
| 19                                 | 100            |
| 12.5                               | 75-100         |
| 9.5                                | 60-90          |
| 4.75                               | 40-70          |
| 2.36                               | 27-55          |
| 1.18                               | 16-42          |
| 0.600                              | 8-30           |
| 0.300                              | 5-20           |
| 0.075                              | 2-8            |

DRIVE NEW ANGLE POSTS INTO GROUND FOR ADDITIONAL DEBRIS DEFLECTION. STABILIZE POSTS WITH ONE HORIZONTAL ANGLE WELDED ACROSS POSTS

ENVIRONMENTAL

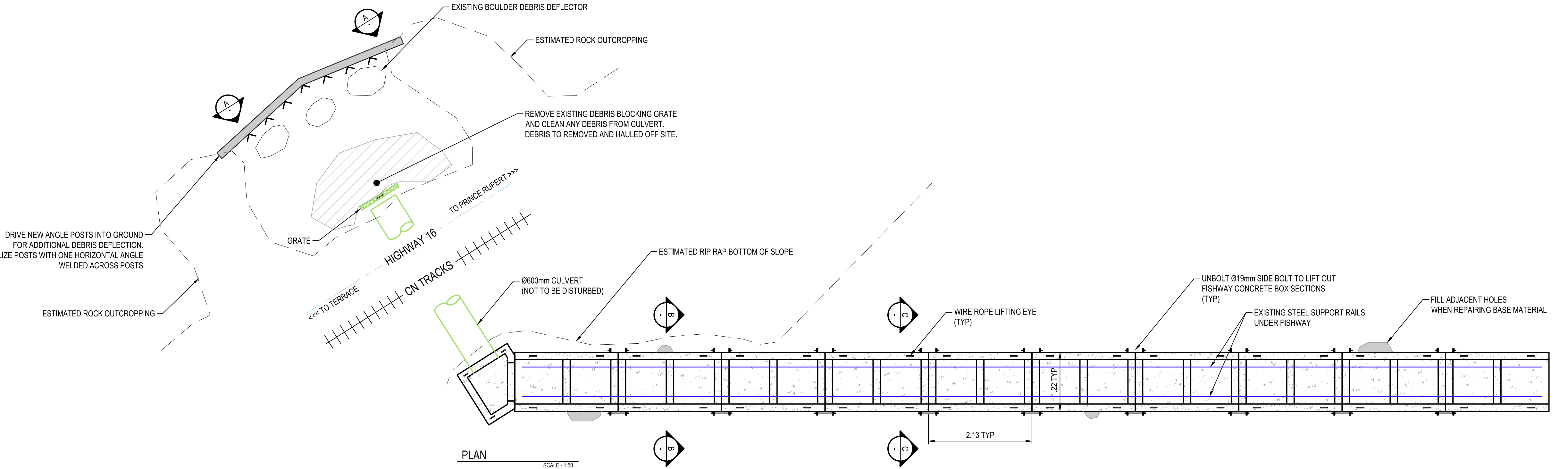
- SEDIMENT MUST BE PREVENTED FROM ENTERING THE NEARBY WATERCOURSES.
- ALL WORK SHALL BE DONE IN A MANNER THAT WILL NOT RESULT IN DEPOSITION OF LOGGING DEBRIS, SOIL, OR OTHER MATERIAL DELETERIOUS TO FISH, IN ANY WATERCOURSE.
- ENSURE ANY RIPRAP TO BE USED IS CLEAN AND WASHED OFF SITE, IS OF SUITABLE QUALITY, PLACED INTO THE BANK SUCH THAT IT DOES NOT CONSTRICT THE CHANNEL BY EXTENDING INSIDE THE EXISTING BANK CONFIGURATION.
- DISTURBANCE TO THE SLOPES MUST BE MINIMIZED. SLOPE STABILITY AND EROSION PREVENTION IS CRITICAL. RECONSTRUCT AND REVEGETATE DISTURBED SLOPES TO THEIR ORIGINAL CONDITION AS SOON AS ACTIVITY IS COMPLETED.

BACKFILL AND COMPACTION

- THE ZONE OF COMPACTION SHALL BE AS SHOWN ON THE DRAWING AND COMPACTED TO 98% OF STANDARD PROCTOR DENSITY, AT OPTIMUM MOISTURE CONTENT. MATERIAL COMPACTION TESTING MAY BE REQUIRED BY THE ENGINEER'S REPRESENTATIVE.
- BACKFILLING MATERIAL TO BE FREE DRAINING GRANULAR MATERIAL THAT IS APPROVED BY THE ENGINEER'S REPRESENTATIVE PRIOR TO ALL BACKFILLING OPERATIONS.
- BACKFILLING TO BE COMPLETED IN LEVEL LIFTS OF APPROVED MATERIAL, 150mm TO 300mm THICK AND COMPACTED AS SPECIFIED ON DRAWINGS.
- MINIMUM 500mm THICK COVER REQUIRED OVER CULVERT PRIOR TO ANY CONSTRUCTION TRAFFIC.
- STRUCTURAL FOOTING PAD CONSTRUCTION TO BE REVIEWED BY FIELD ENGINEER BEFORE PROCEEDING WITH BOX INSTALLATION

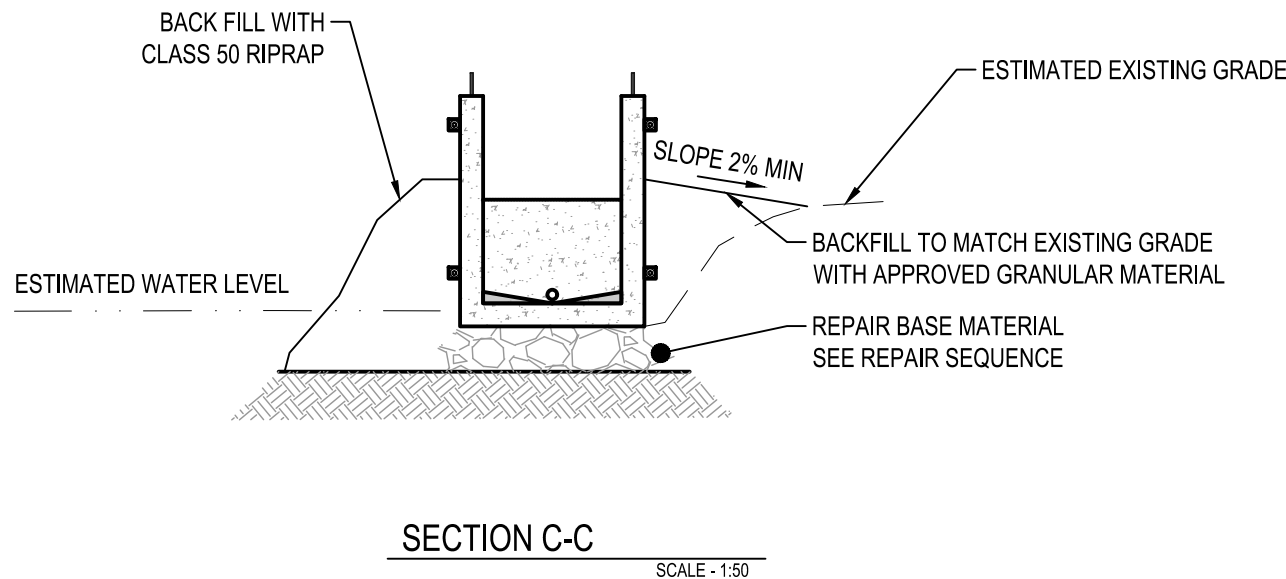
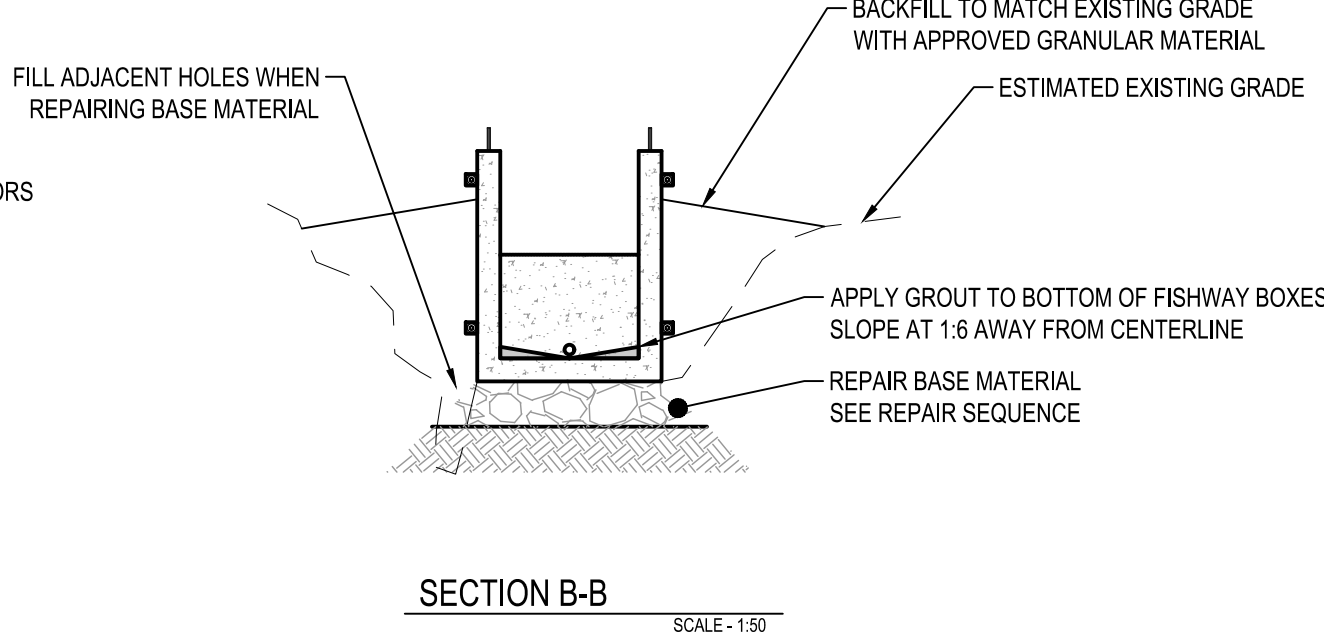
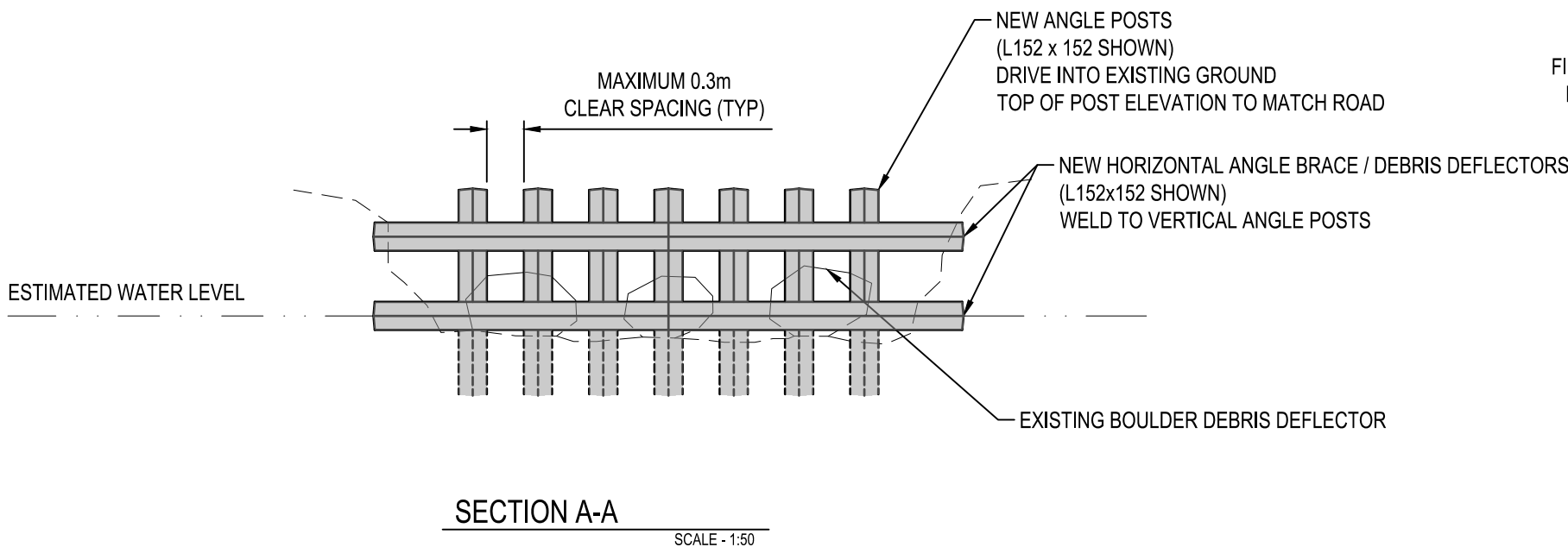
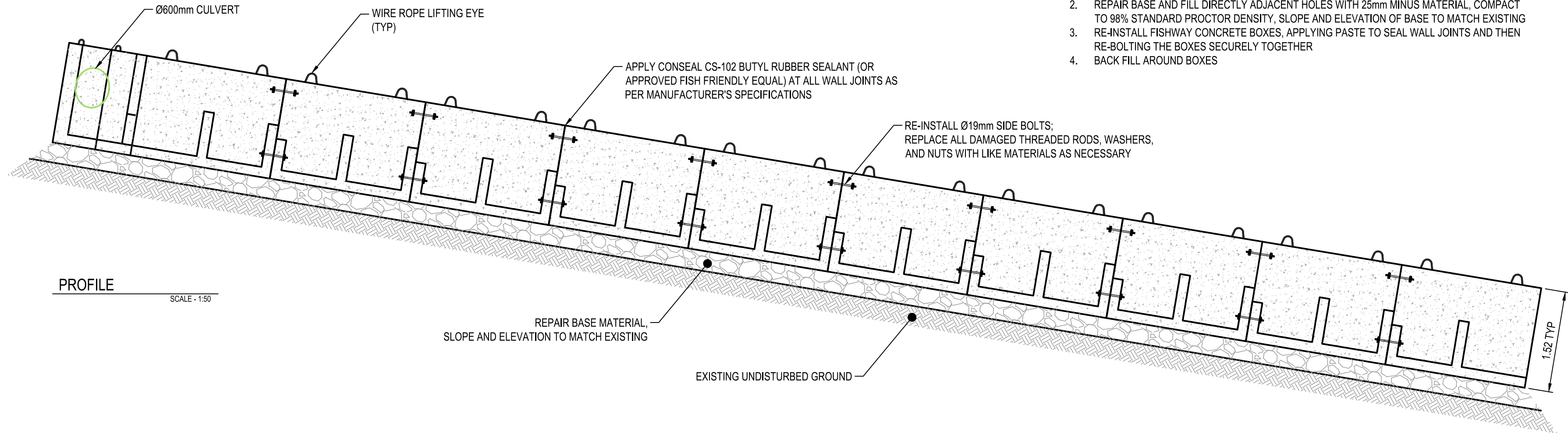
SEALANT

- BUTYL MASTIC JOINTING MATERIAL TO BE CONSEAL CS-102 BUTYL RUBBER SEALANT OR APPROVED EQUIVALENT. SEALANT SHALL BE APPLIED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
- SEALANT SHALL BE KEPT AT TEMPERATURES AND STORAGE CONDITIONS IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS.



REPAIR SEQUENCE:

- DISCONNECT AND LIFT OUT EXISTING FISHWAY CONCRETE BOXES
- REPAIR BASE AND FILL DIRECTLY ADJACENT HOLES WITH 25mm MINUS MATERIAL. COMPACT TO 98% STANDARD PROCTOR DENSITY, SLOPE AND ELEVATION OF BASE TO MATCH EXISTING
- RE-INSTALL FISHWAY CONCRETE BOXES, APPLYING PASTE TO SEAL WALL JOINTS AND THEN RE-BOLTING THE BOXES SECURELY TOGETHER
- BACK FILL AROUND BOXES



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ORIGINAL DWG SIZE: ANSI D (22" x 34")



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PERMIT TO PRACTICE

McElhanney Ltd.  
PERMIT NUMBER: 1003299

Engineers and Geoscientists  
of British Columbia



CANADIAN WILDLIFE FEDERATION  
350 MICHAEL COWPLAND DRIVE, KANATA, ONTARIO K2M 2W1

EXCHAMSIKS FISHWAY  
REPAIR  
PLAN, PROFILE, AND NOTES

Drawing No.

C-100

Project Number  
2321-02060-00

Rev.  
0

DESTROY ALL PRINTS BEARING PREVIOUS REVISION

## Butyl Rubber Sealant for All Precast Concrete Structures - Meets ASTM C990

### Applications

For concrete joints in: Manholes, Concrete Pipe, Vaults, Box Culverts, Septic Tanks, and Vertical Panel Structures. **Not intended for use in expansion joints or joints that move.**



### Sealing Properties

- Provides permanently flexible watertight joints.
- Low to high temperature workability: 30°F to 120°F (-1°C to +49°C)
- Rugged service temperature: -30°F to +200°F (-34°C to +93°C)
- Excellent chemical and mechanical adhesion to clean dry surfaces.
- Greater cohesive and adhesive strengths.
- Sealed joints will not shrink, harden or oxidize upon aging.
- Controlled flow resistance for application ease.
- ConSeal CS-102 meets the hydrostatic performance requirement as set forth in ASTM C990 section 10.1.  
(Performance requirement: 10psi for 10 minutes in straight alignment – in plant, quality control test for joint materials.)
- ConSeal CS-102 meets or exceeds all of the requirements of Federal Specification SS-S-210 (210-A), and AASHTO M-198B.
- No priming normally necessary. When confronted with difficult installation conditions, such as wet concrete or temperatures below 40°F (4°C), priming the concrete will improve the bonding action. Consult Concrete Sealants for the proper primer to meet your application.

### Physical Properties & Chemical Composition

| Description                                   | Spec        | Required   | CS-102    |
|-----------------------------------------------|-------------|------------|-----------|
| Color                                         |             |            | Black     |
| Specific Gravity, 77°F (25°C)                 | ASTM D71    | 1.15-1.50  | 1.25      |
| Ductility, 77°F (25°C)                        | ASTM D113   | 5.0 min.   | 10        |
| Penetration, cone 77°F (25°C), 150 gm, 5 sec. | ASTM D217   | 55-100 dmm | 55-60 dmm |
| Flash Point, C.O.C., °F                       | ASTM D92    | 350°F min. | 375°F     |
| Fire Point, C.O.C., °F                        | ASTM D92    | 375°F min. | 475°F     |
| Hydrocarbon plastic content, % by weight      | ASTM D297   | 50% min.   | 51%       |
| Inert material filler, % by weight            | AASHTO T111 | 30% min.   | 35%       |
| Volatile Mater, % by weight                   | ASTM D6     | 3% max.    | 1.2%      |

### Immersion Testing

**30-Day Immersion Testing:** No visible deterioration when tested in 5% Caustic Potash, 5% Hydrochloric Acid, 5% Sulfuric Acid, and 5% saturated Hydrogen Sulfide.

**One Year Immersion Testing:** No visible deterioration when tested in 5% Formaldehyde, 5% Formic Acid, 5% Sulfuric Acid, 5% Hydrochloric Acid, 5% Sodium Hydroxide, 5% Hydrogen Sulfide, and 5% Potassium Hydroxide.

### Installation Guidelines

The following procedures should be followed for optimum sealant performance.

- Clean the upper and lower joint surface with a stiff bristle brush.
- Remove any dirt, debris, flashing, or concrete high points, which could keep the joint from coming together.
- If necessary, a joint primer can be applied to improve sealant adhesion. Allow the primer to dry before placing sealant.
- DO NOT PLACE ANY JOINTS WITHIN 12" OF A CORNER.
- Join the sealant into one continuous strand by kneading the ends together where they meet. **Do not stretch the sealant.**
- A **minimum** compression of 50% is required. Greater than 50% compression is optimal. It may take 15-20 minutes for the sealant to fully compress depending on the ambient temperature and the weight being applied.

Reference Installation Instructions for **"Butyl Sealing Tapes"** for more detailed instructions.

### Limited Warranty

This information is presented in good faith, but we cannot anticipate all conditions under which this information and our products, or the products of other manufactures in combination with our products, may be used. We accept no responsibility for results obtained by the application of this information or the safety and suitability of our products, either alone or in combination with other products. Users are advised to make their own tests to determine the safety and suitability of each such product or product combinations for their own purposes. It is the **users' responsibility** to satisfy himself as to the suitability and completeness of such information for this own particular use. We sell this product without warranty, and buyers and users assume all responsibility and liability for loss or damage arising from the handling and use of this product, whether used alone or in combination with other products.

## Appendix 2.

### Daily Construction Monitoring Reports

## Environmental Monitoring Report



Project Name: Exchamsiks River Fishway  
Triton Project #: 8075 Project Manager:  
Client: Progressive Ventures  
Client Supervisor(s):  
Location: Exchamsiks River Fishway  
Inspection Date: February 21 2024 Environmental Monitor: Ben Hewitt

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### Weather

Temperature (C): -3 Weather Conditions: Clear  
Significant Rain Event: ☐ Yes ☒ No Ground Conditions: Snow  
Amount of Rain (mm):

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### Current Construction Activities

- Mobilizing excavator to site
- building rail crossing to access fishway on the south side of the railway
- clearing of vegetation (shrubs and 1 danger tree) to stage excavator
- removal of rip rap on west side of fishway
- installation of access ramp to east side of fishway
- removal of fishway other than the last 4 boxes. 3 boxes will remain installed at the direction of DFO. One more box will be removed tomorrow.
- installation of sand bag berm to mitigate sediment runoff into stream.

### Upcoming Construction Activities

### General Monitoring Notes

- Front End Loader was mobilized and staged on site yesterday (Feb 20). No spill tray was placed under the machine last night. Spill trays were brought to site today and will be placed ne'er the machine when it's not in use.
- Excess grease observed on excavator during mobilization inspection. PVL supervisor notified and the excess grease was promptly cleaned up.
- Spill barrel on site and adequately stocked
- DFO (Natalie, Sandra and Kat) made a site visit. DFO will supply coco to be installed on site tomorrow (Feb 22).
- fish scare pass occurred before placement of the sandbag berm
- sandbag berm did not fully contain water and sediment. Sediment plume occurred as PVL removed the last two fishway boxes which were partially in the water. Additional sandbags will be placed on this berm tomorrow.
- sediment curtain was not used as its installation and removal was anticipated to cause additional turbidity
- excavator will be staged >30m from the water on the south side of the railway.
- front end loader will be staged on a pullout opposite the work area <30m from the water on the north side of Hwy 16 due to a lack of staging areas

## Monitoring Checklist



Vehicle track out - is it present? Acceptable  
Are wheel wash or rock pads intact and effective?

Are ESC measures onsite intact and effective? Acceptable

Sediment fencing installed at the end of the day. Coco matting will be mobilized to site and installed tomorrow.

Are connections to storm sewer adequately protected? Not Applicable

Internal Water Control: Are internal drainage features intact and effective? Acceptable

Are roads within the site clean and free of sediment build-up? Acceptable

Are stockpiles properly located? Are they covered and secured? Acceptable

Are bare slopes and flat ground adequately covered? Needs Improvement

Coco matting will be mobilized to site and installed tomorrow.

Is waste onsite properly stored? Acceptable

Are spill kits present, stocked and in close proximity? Acceptable

Are fuel containers properly marked and stored onsite? Not Applicable

Are environmentally sensitive areas adequately protected? Acceptable

Any problems with wildlife? Acceptable

Are invasive plants present? Is treatment required? Acceptable

Concrete Management: slurry disposal, containment Not Applicable

## Water Quality



Water quality meets municipal and BC Water Quality Guidelines?\*

☐ Yes ☐ No

Comments:

The LaMotte turbidity meter was calibrated in the morning and was within the acceptable calibration criteria.

### Water Quality Measurements

| Location       | UTM                   | Time (24hr) | Temp (°C) | pH | Turbidity (NTU) | Visual Observations                                                                                                                                          |
|----------------|-----------------------|-------------|-----------|----|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Background     | 9 U 484619<br>6020955 | 08:58       |           |    | 1.41            |                                                                                                                                                              |
| 25m downstream | 9 U 484686<br>6020916 | 13:35       |           |    | 11.40           | Exceeds 8NTU over background.<br><br>Small turbidity plume observed when rip rap on east side of fishway was removed. Low flows results in minimal dilution. |
| 25m downstream | 9 U 484684<br>6020915 | 13:43       |           |    | 9.20            | With 8NTU of background                                                                                                                                      |
| 25m downstream | 9 U 484686<br>6020916 | 13:49       |           |    | 3.49            |                                                                                                                                                              |
| 25m downstream | 9 U 484686<br>6020916 | 14:39       |           |    | 36.90           | Exceeds 8 NTU over background                                                                                                                                |
| 25m downstream | 9 U 484686<br>6020916 | 14:51       |           |    | 10.80           | Exceeds 8 NTU over background                                                                                                                                |
| 25m downstream | 9 U 484686<br>6020916 | 14:58       |           |    | 7.70            | Within 8 NTU of background                                                                                                                                   |

## Photographs



1 Front End Loader



2 Excavator

## Photographs



- 3 Excess grease on bucket cleared up.



- 4 Excavator clearing vegetation for staging area on south side of the CN railway

## Photographs



5 Excavator removing rip rap from west side of fishway



6 Partial removal of fishway

## Photographs



- 7 Fishway boxes being drained over water immediately after removal. Sandbag berm installed.



- 8 Sediment fencing installed at the end of the day.

Report Prepared by: Ben Hewitt

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Signature



Fisheries  
and Oceans

Pêches  
et Océans

## MEMORANDUM

## NOTE DE SERVICE

To  
À

File  
Betty Rebellato (CWF), Stephen Chapman  
(Progressive Ventures)

From  
De

Sandra Devcic, P.Eng.  
North Coast Area, SEP

Subject  
Objet

cc: Michael Gull, Natalie Newman, Katherine  
Punis, Lana Miller

**SITE VISIT – EXCHAMSIKS FISHWAY REPAIRS**

Security Classification - Classification de sécurité

**UNCLASSIFIED**

Our file - Notre référence

**EXCHAMSIKS FISHWAY**

Your File - Votre référence

Date

**Feb 21, 2024**

The following photos were taken while on site February 21, 2024. They are intended to accompany the email report for that date.



Photo 1 – upstream of the work, big back-channel. Low water conditions.



Photo 2 – upstream side of the highway, debris accumulated on the outlet pipe



Photo 3 – looking towards the culvert inlet



Photo 4 – the culvert inlet is set on the grade seal. Fish were observed at the toe, in the open water.



Photo 5 – toe of the downstream embankment



Photo 6 – bottom end of the fishway at low water.



Photo 7 – looking upstream



Photo 8 – looking upstream



Photo 9 – corner box at the top of the fishway. Weir should be backwatering the culvert to the inlet



Photo 10 – ground conditions outside the top box of the fishway, gravels with riprap.



Photo 11 – collar at the culvert stub incorporated a sealer product as well as filter cloth



Photo 12 – site overview before boxes were moved



Photo 13 – the parked excavator, for proximity to the creek



Photo 14 – site overview – moving boxes



Photo 15 – moving boxes.



Photo 16 – removing boxes from the chain



Photo 17 – component fishway box (Thomas)



Photo 18 – end view of fishway box



Photo 19 – site overview



Photo 20 – fishway boxes ready to be loaded out



Photo 21 – site overview

## Environmental Monitoring Report



Project Name: Exchamsiks River Fishway  
Triton Project #: 8075 Project Manager: Robert Donald  
Client: Progressive Ventures  
Client Supervisor(s):  
Location: Exchamsiks River Fishway  
Inspection Date: February 22 2024 Environmental Monitor: Brady Utas

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### Weather

Temperature (C): -4 Weather Conditions: Clear  
Significant Rain Event: ☐ Yes ☒ No Ground Conditions: Snow  
Amount of Rain (mm):

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### Current Construction Activities

- Removal of last fishway box
- Installation of coco matting
- Loading fishway boxes onto low bed and hauling off site
- Placing additional sandbags on berm
- Culvert collar removal

### Upcoming Construction Activities

### General Monitoring Notes

- Trains delayed work until 08:43
- Equipment inspected for excess grease noticed yesterday. None found, problem resolved.
- Water level after last box removed too low to flow past remaining boxes at the present time.
- All coco matting provided was used, focussing on exposed soil nearest the water course. No stakes available, rocks used to keep in place.
- Loader parked on north side of Hwy16 in a pull out >30m from water course
- Excavator parked on south side of Hwy16 <30m from water course due to lack of staging area
- All machinery has spill trays underneath at end of day
- Kitsumkalum fish and wildlife made a site visit
- Turbidity did not exceed 8NTU of background

## Monitoring Checklist



Vehicle track out - is it present? Acceptable  
Are wheel wash or rock pads intact and effective?

Are ESC measures onsite intact and effective? Acceptable

Are connections to storm sewer adequately protected? Not Applicable

Internal Water Control: Are internal drainage features intact and effective? Acceptable

Are roads within the site clean and free of sediment build-up? Acceptable

Are stockpiles properly located? Are they covered and secured? Acceptable

Are bare slopes and flat ground adequately covered? Acceptable  
Coco matting installed, focussing on exposed soils nearest the water course

Is waste onsite properly stored? Acceptable

Are spill kits present, stocked and in close proximity? Acceptable

Are fuel containers properly marked and stored onsite? Not Applicable

Are environmentally sensitive areas adequately protected? Acceptable

Any problems with wildlife? Acceptable

Are invasive plants present? Is treatment required? Acceptable

Concrete Management: slurry disposal, containment Not Applicable

## Water Quality



Water quality meets municipal and BC Water Quality Guidelines?\*

☐ Yes ☐ No

Comments:

LaMotte turbidity meter calibrated in the morning and within acceptable thresholds

### Water Quality Measurements

| Location       | UTM                   | Time (24hr) | Temp (°C) | pH | Turbidity (NTU) | Visual Observations |
|----------------|-----------------------|-------------|-----------|----|-----------------|---------------------|
| Background     | 9 U 484686<br>6020922 | 08:46       |           |    | 2.19            |                     |
| 25m downstream | 9 U 484688<br>6020922 | 09:08       |           |    | 1.88            |                     |
| 25m downstream | 9 U 484688<br>6020922 | 10:06       |           |    | 5.30            |                     |
| 25m downstream | 9 U 484688<br>6020922 | 10:37       |           |    | 3.58            |                     |
| 25m downstream | 9 U 484688<br>6020922 | 10:54       |           |    | 4.45            |                     |

## Photographs



1 Removing last fishway box



2 Last fishway box removed

## Photographs



3



4

## Photographs



5 Reinforced sandbag berm



6 Sandbags in culvert to block potential flow

## Photographs



7 Coco matting installed



8

Report Prepared by: Brady Utas

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Signature



Kitsumkalum Indian Band  
Fish and Wildlife Operations

## Environmental Monitoring Report

Project Name/Number: *Exchamsiks Fishway Repair*

Client:

Contractor: *Progressive*

Contract No:

|                                                                                                                                      |                      |              |             |                   |              |
|--------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------|-------------|-------------------|--------------|
| Prepared By                                                                                                                          | <i>Allen Miller</i>  | Time On Site | <i>9:44</i> | Time Leaving Site | <i>03:00</i> |
| Date                                                                                                                                 | <i>Feb. 22, 2024</i> |              |             |                   |              |
| Weather                                                                                                                              | <i>Sunny + Clear</i> |              |             |                   |              |
| Equipment and Workforce on Site (Including Photos)<br><i>Loader</i><br><i>Excavator</i><br><i>Flaggers operators engineers.</i>      |                      |              |             |                   |              |
| Construction Activities and Progress (Include Photos)<br><i>Removal of Cement Structure.</i>                                         |                      |              |             |                   |              |
| Discussions with Contractor<br><i>- Signed safety sheet.</i><br><i>- Talked about safety issues.</i><br><i>- Confirmed schedule.</i> |                      |              |             |                   |              |
| Discussions with Others<br><i>Engineers Just to get progress updates</i>                                                             |                      |              |             |                   |              |
| Notes and Comments<br><i>Lots of Progress of 2nd Day</i>                                                                             |                      |              |             |                   |              |



**Kitsumkalum Indian Band  
Fish and Wildlife Operations**

| Environmental Site Conditions (NC=Non-Compliant, N/A= Not Applicable) |     |    |     |                         |                   |
|-----------------------------------------------------------------------|-----|----|-----|-------------------------|-------------------|
| <b>Erosion and Sediment Control</b>                                   | OK  | NC | N/A | Comments and Mitigation | Action Corrected? |
| Access points                                                         | ✓   |    |     |                         |                   |
| Laydown area                                                          | ✓   |    |     |                         |                   |
| Water diversion                                                       | ✓   |    |     |                         |                   |
| Instream isolation                                                    | ✓   |    |     |                         |                   |
| Other:                                                                |     |    |     |                         |                   |
| <b>Fuel and Oil Management</b>                                        | OK  | NC | N/A | Comments and Mitigation | Action Corrected? |
| Spill Kits/Spill Response Plan                                        | ✓   |    |     |                         |                   |
| Fuel Storage                                                          | ✓   |    |     |                         |                   |
| Refueling Location                                                    | ✓   |    |     |                         |                   |
| Equipment Condition (e.g.leaks)                                       | ✓   |    |     |                         |                   |
| Spill trays                                                           | ✓   |    |     |                         |                   |
| Other:                                                                |     |    |     |                         |                   |
| <b>Waste Management</b>                                               | OK  | NC | N/A | Comments and Mitigation | Action Corrected? |
| Deleterious substance use and storage                                 |     |    |     |                         |                   |
| Waste disposal                                                        | ✓   |    |     |                         |                   |
| Others:                                                               |     |    |     |                         |                   |
| <b>Habitat Management</b>                                             | OK  | NC | N/A | Comments and Mitigation | Action Corrected? |
| Sensitive habitat features (instream area of Creek)                   | ✓   |    |     |                         |                   |
| Riparian area                                                         | ✓   |    |     |                         |                   |
| Others:                                                               |     |    |     |                         |                   |
| <b>Water Quality</b>                                                  | OK  | NC | N/A | Comments and Mitigation | Action Corrected? |
| Turbidity                                                             | ✓   |    |     | Never over 8.           |                   |
| pH                                                                    |     |    |     | .                       |                   |
| <b>ACTIONS RECOMMENDED/REQUIRED</b>                                   |     |    |     |                         |                   |
|                                                                       |     |    |     |                         |                   |
| Incident Report Required?                                             | Yes |    | No  | Reason:                 |                   |

## Environmental Monitoring Report



Project Name: Exchamsiks River Fishway  
Triton Project #: 8075 Project Manager: Robert Donald  
Client:  
Client Supervisor(s): Jordan Peddle, Progressive Ventures Construction  
Location: Exchamsiks River fishway  
Inspection Date: March 04 2024 Environmental Monitor: Adam Dutil

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### Weather

Temperature (C): -3 Weather Conditions: Clear  
Significant Rain Event: ☐ Yes ☐ No Ground Conditions: Snow  
Amount of Rain (mm): 0

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### Current Construction Activities

- 4 of the cement blocks arrived on site
- 3 loads of gravel arrived on site staged across road
- Snow removal from work area using excavator
- dewatering cofferdam into well vegetated area using 1 inch pump. Poly used at end of discharge line as energy dissipator. 11NTU at discharge location. Fish screen in use on intake line. Spill tray under pump.
- Sediment fence removed
- Attempted placement of block- insufficient dewatering made placement difficult and ineffective. 7NTU downstream during placement. 2NTU background

### Upcoming Construction Activities

- Bring larger dewatering pump tomorrow and reattempt block placement.

### General Monitoring Notes

- Multiple delays due to train activity.
- DFO site visit (Kat).
- Kitsumkalum site visit (Don and Jason).
- Spill trays in use upon arrival .
- spill kit drum on site sufficiently stocked.
- Machinery inspection performed- no deficiencies.

## Monitoring Checklist

Vehicle track out - is it present? Acceptable  
Are wheel wash or rock pads  
intact and effective?

Are ESC measures onsite Acceptable  
intact and effective?

Are connections to storm sewer Not Applicable  
adequately protected?

Internal Water Control: Are Acceptable  
internal drainage features intact  
and effective?

Are roads within the site clean Acceptable  
and free of sediment build-up?

Are stockpiles properly Acceptable  
located? Are they covered and  
secured?

Are bare slopes and flat ground Acceptable  
adequately covered?

Is waste onsite properly Acceptable  
stored?

Are spill kits present, stocked Acceptable  
and in close proximity?

Are fuel containers properly Acceptable  
marked and stored onsite?

Are environmentally sensitive Acceptable  
areas adequately protected?

Any problems with wildlife? Not Applicable

Are invasive plants present? Is Not Applicable  
treatment required?

Concrete Management: slurry Not Applicable  
disposal, containment

## Water Quality

Water quality meets municipal and BC Water Quality Guidelines?\*

☒ Yes ☐ No

### Water Quality Measurements

| Location           | UTM | Time (24hr) | Temp (°C) | pH | Turbidity (NTU) | Visual Observations                  |
|--------------------|-----|-------------|-----------|----|-----------------|--------------------------------------|
| Background         |     | 07:49       |           |    | 1.55            | Clean                                |
| 25m downstream     |     | 09:16       |           |    | 2.72            | Clean                                |
| 25m downstream     |     | 14:09       |           |    | 2.20            | Clean                                |
| Discharge location |     | 13:03       |           |    | 11.01           |                                      |
| 25m downstream     |     | 14:21       |           |    | 7.09            | Taken during block placement attempt |

## Photographs



1 Equipment inspection



2 Spill kit adequately stocked

## Photographs



3 Spill tray in use



4 Grout in block

## Photographs



5 Gravel stockpile



6 Unloading blocks

## Photographs



7 Dewatering cofferdam



8 Discharge location

## Photographs



9 Attempting block placement



10 Sealant application

## Environmental Monitoring Report



Project Name: Exchamsiks River Fishway  
Triton Project #: 8075 Project Manager: Robert donald  
Client: Wildlife/DFO  
Client Supervisor(s): Jordan  
Location: Exchamsiks Fishway  
Inspection Date: March 05 2024 Environmental Monitor: Adam Dutil

---

### Weather

Temperature (C): -13 Weather Conditions: Clear  
Significant Rain Event: ☐ Yes ☒ No Ground Conditions: Snow  
Amount of Rain (mm): 0

---

### Current Construction Activities

Dewatering cofferdam to place fishway blocks  
Unloading truckload of blocks . All are staged on site now  
Placing drain rock to fill, level and align blocks  
Applying sealant in between blocks  
Culvert connector installed  
Blocks 8, 9, 1 and 2 installed

### Upcoming Construction Activities

Block placement and drain rock application

### General Monitoring Notes

Spill trays in place upon arrival.  
Spill kit drum fully stocked.  
Machine inspection of loader and excavator- no leaks or excess grease observed.  
Energy dissipator (poly) at discharge locations (well vegetated area sloped away from water course)  
3 discharge locations established spread out as much as possible 2x3" pumps 1x2" pump. Water was returning to site due to lack of hose, PVL had hose extensions delivered to site and these were installed for better infiltration potential and to get the discharging water further from watercourse and work site. Fish screens in use on intake. Spill tray in use for generator and 2" pump  
Waste removal from site occurring daily  
LaMotte calibrated in morning.  
No wildlife observations  
Work delays throughout day due to trains  
Site visit from DFO and Kitsumkalum

Fishway repair.

Fishway repair.

## Monitoring Checklist

Vehicle track out - is it present? Not Applicable  
Are wheel wash or rock pads  
intact and effective?

Are ESC measures onsite  
intact and effective? Acceptable

Are connections to storm sewer  
adequately protected? Not Applicable

Internal Water Control: Are  
internal drainage features intact  
and effective? Acceptable

Are roads within the site clean  
and free of sediment build-up? Acceptable

Are stockpiles properly  
located? Are they covered and  
secured? Acceptable

Are bare slopes and flat ground  
adequately covered? Acceptable

Is waste onsite properly  
stored? Acceptable

Are spill kits present, stocked  
and in close proximity? Acceptable

Are fuel containers properly  
marked and stored onsite? Acceptable

Are environmentally sensitive  
areas adequately protected? Acceptable

Any problems with wildlife? Not Applicable

Are invasive plants present? Is  
treatment required? Not Applicable

Concrete Management: slurry  
disposal, containment Not Applicable

## Water Quality

Water quality meets municipal and BC Water Quality Guidelines?\*

☒ Yes ☐ No

### Water Quality Measurements

| Location       | UTM | Time (24hr) | Temp (°C) | pH | Turbidity (NTU) | Visual Observations                           |
|----------------|-----|-------------|-----------|----|-----------------|-----------------------------------------------|
| Background     |     | 07:23       |           |    | 2.73            | Clean clear                                   |
| Background     |     | 10:44       |           |    | 1.89            | During block 9 placement                      |
| 25m downstream |     | 10:46       |           |    | 2.48            | During block 9 placement                      |
| 25m downstream |     | 10:59       |           |    | 4.30            | Temporary plume observed from block placement |
| 25m downstream |     | 11:29       |           |    | 4.87            | Elevated turbidity from block placement       |
| 25m downstream |     | 12:41       |           |    | 2.42            | Elevation from block placement resolved       |

## Photographs



1 Block 2 placement



2 Adding drain rock under block 1

## Photographs



3 Installing culvert junction



4 Drain rock application

## Photographs



5 Block 8 placement



6 Block 9 installment

## Photographs



7 Block 9 placement including view of con sealant



8 Discharge location #2

## Photographs



9 Remainder of blocks arrive on site



10 Pumps, gen set in spill tray, fish screens in use

## Photographs



11 Pre work activities

## Environmental Monitoring Report



Project Name: Exchamsiks River Fishway  
Triton Project #: 8075 Project Manager: Robert donald  
Client: DFO/ wildlife  
Client Supervisor(s): Jordan  
Location: Exchamsiks fishway  
Inspection Date: March 06 2024 Environmental Monitor: Adam Dutil

---

### Weather

Temperature (C): -6 Weather Conditions: Light Snowfall  
Significant Rain Event: ☐ Yes ☒ No Ground Conditions: Snow  
Amount of Rain (mm): 0

---

### Current Construction Activities

Placing blocks #3-7. Limited interaction with water course today, all the blocks to be placed are on dry ground outside of wetted area.  
Dewatering into well vegetated area draining away from watercourse. Discharge location bumped around periodically to allow for infiltration.  
Dewatering complete around 10

### Upcoming Construction Activities

Debris clean up from upstream side of culvert  
Rip rap placement  
general site tidy up and demob.

### General Monitoring Notes

Spill trays in place upon arrival  
Machines staged >30m away from watercourse  
Full spill kit drum present on site  
Machines inspected- no excess grease or leaks  
LaMotte calibrated in morning  
Waste being removed on daily basis  
No wildlife sightings  
Wildlife attractants are stored in trucks  
Temporary drain rock stockpile staged >30m away from HWM  
Kitsumkalum EM on site Jason  
DFO visit Sandy

## Monitoring Checklist

Vehicle track out - is it present? Not Applicable  
Are wheel wash or rock pads intact and effective?

Are ESC measures onsite intact and effective? Acceptable

Are connections to storm sewer adequately protected? Not Applicable

Internal Water Control: Are internal drainage features intact and effective? Not Applicable

Are roads within the site clean and free of sediment build-up? Acceptable

Are stockpiles properly located? Are they covered and secured? Acceptable

Are bare slopes and flat ground adequately covered? Needs Improvement      Machine has disturbed coco mat, this will require attention after works are complete

Is waste onsite properly stored? Acceptable      Coco mat debris from machine walking on top will need to be cleaned up upon completion

Are spill kits present, stocked and in close proximity? Acceptable

Are fuel containers properly marked and stored onsite? Acceptable

Are environmentally sensitive areas adequately protected? Acceptable

Any problems with wildlife? Not Applicable

Are invasive plants present? Is treatment required? Not Applicable

Concrete Management: slurry disposal, containment Not Applicable

---

### **Additional Comments**

PVL crew is receptive and diligent with env. concerns.

## Water Quality



Water quality meets municipal and BC Water Quality Guidelines?\*

☒ Yes ☐ No

Comments:

Little to no interaction with water today. Remainder of blocks are not in wetted area

### Water Quality Measurements

| Location       | UTM | Time (24hr) | Temp (°C) | pH | Turbidity (NTU) | Visual Observations       |
|----------------|-----|-------------|-----------|----|-----------------|---------------------------|
| Background     |     | 06:57       |           |    | 2.38            | Clean                     |
| 25m downstream |     | 09:41       |           |    | 2.45            | During block 7 placement. |
| 25m downstream |     | 11:39       |           |    | 3.41            | Clean                     |

## Photographs



- 1 Spill tray in place upon arrival.



- 2 Site conditions pre work.

## Photographs



- 3 Machine staged >30m away from HWM over night.



- 4 Dewatering using spill trays, fish screen.

## Photographs



5 Up stream of culvert pre disturbance.



6 Removal of isolation berm.

## Photographs



7 Placing drain rock for block 6.



8 Alignment works in progress. All blocks placed.

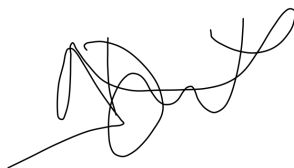
## Photographs



9 Alignment works.

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Report Prepared by: Adam dutil



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Signature

## Environmental Monitoring Report



Project Name: Exchamsiks River Fishway  
Triton Project #: 8075 Project Manager: Robert Donald  
Client: DFO/wildlife  
Client Supervisor(s): Jordan  
Location: Exchamsiks fishway  
Inspection Date: March 07 2024 Environmental Monitor: Adam Dutil

---

### Weather

Temperature (C): -3 Weather Conditions: Light Snowfall  
Significant Rain Event: ☐ Yes ☒ No Ground Conditions: Snow  
Amount of Rain (mm): 0

---

### Current Construction Activities

Placing drain rock  
Placing rip rap  
General site tidy up  
Woody debris removal from upstream side of culvert  
Equipment demob

### Upcoming Construction Activities

### General Monitoring Notes

Spill trays in place upon arrival  
Machines staged >30m away from HWM  
Drain rock stockpile staged >30m away from HWM  
Machines free of excess grease and no leaks observed  
No wildlife observations  
Waste removed daily  
No wildlife attractants present- domestic waste and food stored in trucks  
Extra ESC measures available on site  
Materials brought to site all used up nothing excess to remove  
Slopes and grades that were disturbed were returned to original state and smoothed out.  
Seeding recommended in future and a visit once snow is gone to clean up coco mat debris that was disturbed by machine works.  
Excavator removed woody debris as much as possible. Fines remain -will have to be done by hand.  
Slight turbidity elevation during placement of rip rap (5.75 NTU downstream). Lowered within 1 hour back down to 3.4NTU

## Monitoring Checklist

Vehicle track out - is it present? Not Applicable  
Are wheel wash or rock pads intact and effective?

|                                               |                   |                                                                                                                                            |
|-----------------------------------------------|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| Are ESC measures onsite intact and effective? | Needs Improvement | Machine has walked on coco mat this will require attention when work is complete and snow is gone. Visible loose debris has been picked up |
|-----------------------------------------------|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------|

|                                                      |                |  |
|------------------------------------------------------|----------------|--|
| Are connections to storm sewer adequately protected? | Not Applicable |  |
|------------------------------------------------------|----------------|--|

|                                                                              |                |  |
|------------------------------------------------------------------------------|----------------|--|
| Internal Water Control: Are internal drainage features intact and effective? | Not Applicable |  |
|------------------------------------------------------------------------------|----------------|--|

|                                                                |            |  |
|----------------------------------------------------------------|------------|--|
| Are roads within the site clean and free of sediment build-up? | Acceptable |  |
|----------------------------------------------------------------|------------|--|

|                                                                |            |  |
|----------------------------------------------------------------|------------|--|
| Are stockpiles properly located? Are they covered and secured? | Acceptable |  |
|----------------------------------------------------------------|------------|--|

|                                                     |                   |                                                                                                                       |
|-----------------------------------------------------|-------------------|-----------------------------------------------------------------------------------------------------------------------|
| Are bare slopes and flat ground adequately covered? | Needs Improvement | Coco mat disturbed by machine, visible debris has been cleaned up. touch up and seeding recommended when snow is gone |
|-----------------------------------------------------|-------------------|-----------------------------------------------------------------------------------------------------------------------|

|                                  |            |               |
|----------------------------------|------------|---------------|
| Is waste onsite properly stored? | Acceptable | Removed daily |
|----------------------------------|------------|---------------|

|                                                         |            |                     |
|---------------------------------------------------------|------------|---------------------|
| Are spill kits present, stocked and in close proximity? | Acceptable | Full spill kit drum |
|---------------------------------------------------------|------------|---------------------|

|                                                        |            |  |
|--------------------------------------------------------|------------|--|
| Are fuel containers properly marked and stored onsite? | Acceptable |  |
|--------------------------------------------------------|------------|--|

|                                                           |            |  |
|-----------------------------------------------------------|------------|--|
| Are environmentally sensitive areas adequately protected? | Acceptable |  |
|-----------------------------------------------------------|------------|--|

|                             |                |                          |
|-----------------------------|----------------|--------------------------|
| Any problems with wildlife? | Not Applicable | No wildlife observations |
|-----------------------------|----------------|--------------------------|

|                                                     |                |  |
|-----------------------------------------------------|----------------|--|
| Are invasive plants present? Is treatment required? | Not Applicable |  |
|-----------------------------------------------------|----------------|--|

|                                                   |                |  |
|---------------------------------------------------|----------------|--|
| Concrete Management: slurry disposal, containment | Not Applicable |  |
|---------------------------------------------------|----------------|--|

## **Concerns and Recommendations**

| <b><u>Observation</u></b> | <b><u>Recommendation</u></b>                                                                                      | <b><u>Date</u></b> | <b><u>Status</u></b> |
|---------------------------|-------------------------------------------------------------------------------------------------------------------|--------------------|----------------------|
|                           | Seeding using native seeds along bank and where machine has walked/ disturbed ground recommended when appropriate |                    |                      |
|                           | Removal of small woody debris from upstream side of culvert by hand.                                              |                    |                      |

## Water Quality

Water quality meets municipal and BC Water Quality Guidelines?\*

☒ Yes ☐ No

### Water Quality Measurements

| Location       | UTM | Time (24hr) | Temp (°C) | pH | Turbidity (NTU) | Visual Observations                     |
|----------------|-----|-------------|-----------|----|-----------------|-----------------------------------------|
| Background     |     | 07:17       |           |    | 1.66            | Clean<br>Pre works                      |
| 25m downstream |     | 08:03       |           |    | 2.65            | During rip rap and drain rock placement |
| 25m downstream |     | 10:15       |           |    | 5.75            | During rip rap placement                |
| 25m downstream |     | 11:33       |           |    | 3.41            | Work complete                           |

## Photographs



- 1 Fine woody debris remains after excavator clean up. Hand work required to complete task.



- 2 Excavator loading woody debris to be shipped to town.

## Photographs



3 Excavator clearing woody debris from upstream side of culvert.



4 Site post works.

## Photographs



5 Site post works.

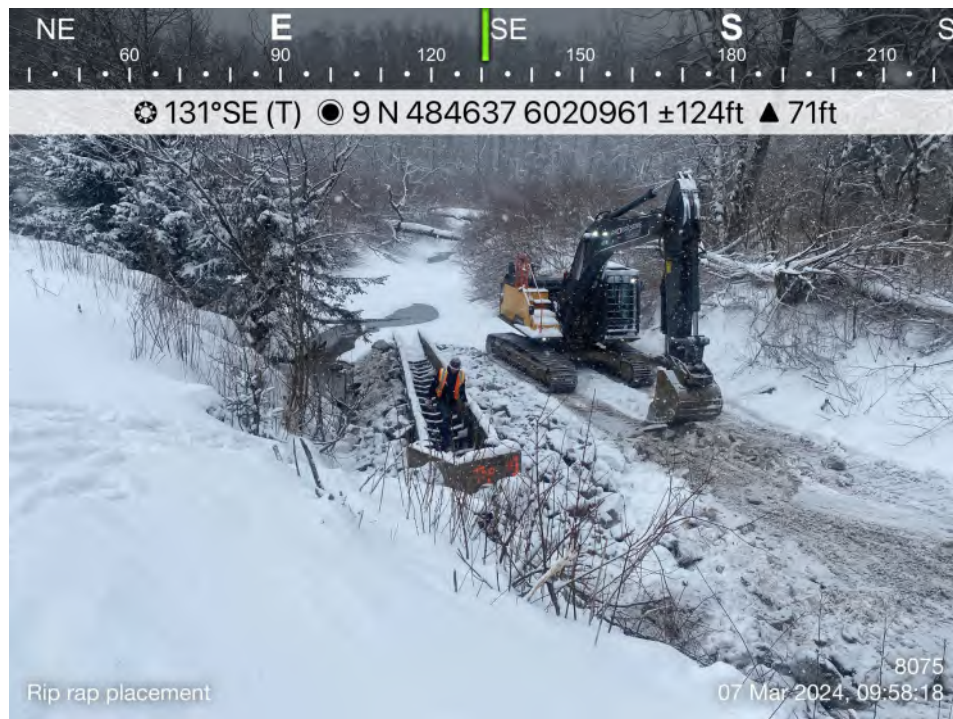


6 Site post works.

## Photographs



7 Fishway after completion of installation.



8 Excavator placing rip rap.

## Photographs



- 9 Excavator placing drain rock and rip rap.



- 10 Extra ESC measures available on site.

## Photographs



- 11 Spill kit drum well stocked.



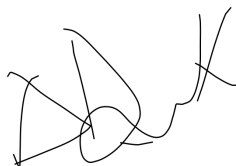
- 12 Spill tray in place upon arrival

## Photographs



13 Site pre works.

Report Prepared by: Adam Dutil

A handwritten signature in black ink, appearing to be 'AD', is positioned above a horizontal line.

Signature

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Report Prepared by: Adam dutil

A handwritten signature in black ink, appearing to read 'ADutil', is positioned above a horizontal line.

Signature

## Photographs



11 Fish screen for dewatering

Report Prepared by: Adam Dutil

A handwritten signature in black ink, appearing to read 'ADutil', is positioned above a horizontal line.

Signature