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Memo

Change Approval Amendment Application: 100403524 (Changes In and About a Stream)

PGL File #: 346-65.01

DATE: March 14, 2023

TO: Front Counter BC

FROM: Chloe Slomowitz

Re: Supplementary Information to Support Change Approval Amendment Application Number 100403524 for Day Road Culvert and Bank Stabilization Works

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The BC Ministry of Transportation and Infrastructure (MoTI) retained PGL Environmental Consultants (PGL) to prepare regulatory approval applications for the MoTI to undertake permanent culvert and stream bank stabilization works at two stream crossing locations conveying creek flows under Day Road in Roberts Creek, BC (the Project). The two stream crossings underneath Day Road—Gough Creek (Watershed Code 900-118200-08700-39000) and Clack Creek (Watershed Code 900-118200-08700) (the Sites)—are located between Roberts Creek Provincial Park and Mt. Elphinstone Provincial Park along the Sunshine Coast of BC. The two streams cross Day Road at approximately 1.6km north of Highway 101 and 170m elevation. The Sites are located at the intersections of Day Road at Gough Creek (UTM Zone 10U 0453805, 5476772) and Clack Creek (UTM Zone 10U 0451567, 5475649) (Appendix 1).

The MoTI/PGL submitted a Change Approval – Changes In and About a Stream (File 2009876) application to the Ministry of Forests in July 2022 to permit the MoTI to conduct interim works at the site, including extending the length of the Gough Creek culvert by 2m and adding 250kg riprap as armoring at the inlet and outlets of both the Gough Creek and Clack Creek culverts. On September 8, 2022, the Ministry of Forests provided the MoTI/PGL with a Change Approval (Approval Number: 2009876). The Ministry of Forests was notified through email communications on August 18, 2022, that the proposed permanent works would be added to the previously issued Change Approval through an amendment application.

1.0 BACKGROUND

Widespread flooding from an atmospheric rain event in November 2021 resulted in the washout of the Gough Creek and Clack Creek culverts that led to Day Road (a 5m-wide, seal-coated, low volume rural road) to wash out and partially collapse under the flooding conditions. Both Sites had pre-existing 1,500mm culverts, which were washed out during high rain and flood events during the fall of 2021. Approximately five days after the washouts on Day Road, the MoTI's Maintenance Contractor was able to re-establish Day Road by installing a single 1,800mm corrugated steel pipe (CSP) culvert at Gough Creek and a 1,500mm CSP culvert at Clack Creek to provide access to residential properties on Day Road beyond the Sites.

The Maintenance Contractor noted that there was a limited availability of large culverts and that they installed the largest that they were able to source. Due to the limited availability of appropriately sized culverts, the Gough Creek culvert was shorter than the original culvert, which required the reinstated road to be narrower than the original width (Appendix 2).

Due to unforeseen delays, the MoTI contractors were unable to complete the approved interim scopes of work within the approved time. Therefore, the permanent design scopes of work (outlined below) will address all outstanding concerns at the Sites (i.e., culvert sizing concerns, removal of old washed-out culverts/debris, and bank stabilization concerns) and provide improved fish passage over the previously existing CSP culverts and the temporary culverts.

2.0 PROJECT DESCRIPTION

The Project will be completed as part of the provincial Disaster Financial Assistance Arrangements (DFAA) work underway across southern BC in response to the fall 2021 floods. DFAA require the Project design to mirror pre-disturbance conditions.

The MoTI retained Urban Systems Ltd. (Urban Systems) to develop the permanent design plan. At this time, Urban Systems has prepared drawings for environmental permitting purposes for environmental permitting for the proposed Project (Appendix 3).

The designs factor in projected climate change and extreme weather (peak-flow) scenarios based on available 2100 climate change models. The culvert slopes will match each creek's natural stream grade. The goal is to prevent embankment sloughing, culvert failure, and sedimentation from impacting the fish and fish habitat within Gough and Clack Creeks. Additionally, the new box culverts with fish baffles will provide improved fish passage under Day Road.

The Project will follow guidelines and Best Management Practices outlined within the following:

1. MoTI's Erosion and Sediment Control Manual (Version 1.0, November 2022) (Appendix 4);
2. MoTI's Sunshine Coast Construction Environmental Management Plan (Appendix 5); and
3. Requirements and Best Management Practices for Making Changes In and About a Stream in British Columbia (January 2022) (Appendix 6).

A Qualified Environmental Professional (QEP) will be onsite conducting environmental monitoring for the duration of instream Project works and sensitive works, such as concrete use. The QEP will monitor turbidity/water quality and erosion and sediment control measures. Fish and amphibian salvage (if required) will be conducted prior to instream works.

The QEP will monitor the Project for compliance with the above-referenced guidance documents. Works will be conducted in the dry, as much as possible, and during low-flow conditions and limited precipitation. Works will be conducted in isolation of flow following Fisheries and Oceans Canada's (DFO's) interim code of practice for temporary cofferdams and diversion channels and end-of-pip fish protection screens for small water intakes in freshwater.

2.1 Project Scope

The Project scope of work includes:

- Removing anthropogenic debris; specifically, the damaged, rusted, washed-out CSP culverts from the downstream habitat at both creeks;
- Removing downstream debris jam ("log jam", large woody debris/tree limbs) accumulated from the atmospheric river flooding event;
- Removing accumulated debris and gravel upstream of the culvert on Gough Creek to direct stream flow to the culvert, to a maximum of 150mm depth;
- Clearing and grubbing the Day Road shoulders for temporary equipment access (to be revegetated);
- Removing the emergency works temporary culverts (1.8m-diameter CSP at Gough Creek and 1.5m-diameter CSP at Clack Creek);

- Installing a single, 20m-long, concrete box culvert measuring 2.7m width by 2.7m height, complete with a concrete headwall and fish baffles (spacing of fish baffles is to be determined) at Gough Creek (Appendix 3);
- Installing two-barrel (twin-barrels) 15m-long concrete box culverts, each barrel measuring 2.4m width by 2.4m height, complete with concrete headwall and fish baffles (spacing of fish baffles is to be determined) (refer to attached engineering drawings) at Clack Creek;
- Stripping surface materials and installing non-woven geotextile fabric. To be covered with 1.5m thickness of 50kg class riprap at the inlet and outlet of Gough Creek (approximately 9m-long riprap apron at inlet, and 14m-long riprap apron at outlet) (Appendix 3);
- Stripping surface materials and installing non-woven geotextile fabric. To be covered with 1.5m thickness of 50kg class riprap at the inlet and outlet of Clack Creek (approximately 6m-long riprap apron at inlet, and 10m-long riprap apron at outlet) (Appendix 3);
- Installing pre-cast headwalls with concrete footings at the inlet and outlet of the Clack Creek twin box culverts;
- Constructing cast-in-place headwalls with concrete footings at the inlet and outlet of the Gough Creek box culvert;
- Adding fisheries gravels overtop the riprap along the stream channel bottom at both creek crossings;
- Installing a pedestrian walkway and walkway fencing along the upstream (northern) edge at both creek crossings; and
- Excavating, stripping, rebuilding, grading, and paving 70m of Day Road surrounding the Gough Creek crossing, and 50m of Day Road surrounding the Clack Creek crossing.

- Removal of trees determined likely to fail, as described in the Arborist Summary Report (Appendix 11)
- Seeding and/or planting any disturbed vegetated areas from construction works, as prescribed in Section 4.0.

2.2 Construction Timeline and Working Outside of Reduced Risk Timing Window

Construction of the Project is scheduled to begin in July 2023 following receipt of regulatory approvals. The MoTI aims to conduct all instream works within the combined least-risk timing window for Coastal Cutthroat Trout and Dolly Vardan (August 1–August 31), however, it is anticipated that some instream and riparian works may extend past the reduced risk timing window, based on the MoTI's requirement to conduct extensive instream works on multiple sites on the Sunshine Coast under the DFAA funding (not described under this Change Approval application) that are a priority for bank stability and public safety. Project works will not extend past October 31 to protect amphibian and trout species potentially present within the site.

Conducting instream works later than August 31 involves working beyond the Dolly Varden reduced risk window, which is recommended to prevent interference during the spawning season. Additional mitigation measures to reduce potential impacts to spawning Dolly Varden will be implemented during works occurring outside of the fish window, including completing the initial diversion of the streams and increasing environmental monitoring frequency to a minimum of a daily inspection. All instream works (regardless of timing) will be isolated, with flow bypassed around the site, maintaining water quantity and water quality.

Dolly Varden are resident species at the Sites and suitable spawning habitat is present both upstream and downstream of the Sites; therefore, adult Dolly Varden relocation is not anticipated. However, if the QEP/Environmental Monitor observes congregations of Dolly Varden trying to migrate upstream of the isolated work zone, then a salvage and relocation may occur (refer to Section 5.0).

If the watercourse is dry, the MoTI intends to conduct instream works in the dry stream channel outside of the reduced risk instream work window, provided other species (birds and amphibians) have also been considered and risks have been mitigated. Works away from streams and riparian habitat, including the proposed road works, can occur outside of the reduced risk timing window.

2.3 Project Footprint

The breakdown of the riparian and aquatic footprint from the proposed Project is shown in Appendix 12-Proposed Impacts Figures and Appendix 7-Habitat Balance Sheet. Please see a detailed description of the impacts below.

2.3.1 Riparian Habitat

The riparian area is defined as functional riparian habitat (i.e., does not include area within permanent structures such as roads and riprap) above the HWM and up to 30m beyond the top of bank. Temporary disturbance to the riparian habitat from clearing and grubbing is 931m^2 (409m^2 at Gough Creek and 522m^2 at Clack Creek). Temporary riparian impacts include areas that will be grubbed but will not have permanent structures placed within them (i.e., culvert headwall/riprap/road), that can be reseeded/vegetated upon completion of the works with native species as described in Section 2.4.

Permanent structures will be placed within the riparian habitat that has been washed out from the floods. The washed-out areas were observed to be disturbed and unvegetated and are presumably within the existing footprint of the previous road and armoured bank that do not function as riparian habitat (the existing conditions can not be confirmed as it was washed out at the time of the survey). As such, the washed-out areas with the placement of permanent structures, including 524m^2 (237m^2 at Gough Creek and 287m^2 at Clack Creek), are not included as impacts in the Habitat Balance Sheet -Appendix 7. There will be no net loss of riparian habitat from the works.

2.3.2 Instream Habitat

Temporary disturbance to the instream habitat from machine access and potential clearing and grubbing is 290m ^{2} (Gough Creek: 130m^2; Clack Creek: 160m^2). The area of disturbance will not have permanent structures placed within them (i.e., culvert headwall/riprap) and will naturalize to previous conditions post-construction. As these impacts are considered temporary, they are not included in the overall impact calculation described in Appendix 9-Habitat Balance Sheet.

The Project anticipates some permanent loss of instream habitat to accommodate the placement of riprap required to effectively stabilize the channel and to account for the larger culvert footprint below the HWM. There will be instream impacts to 133m^2 of aquatic area (83m^2 at Gough Creek and 50m^2 at Clack Creek). The Project also includes the enhancement of 172m^2 (83m^2 at Gough Creek and 89^2 at Clack Creek) of the instream habitat by the placement of spawning gravels along the bottom of the stream bed. With the consideration of the enhancement area, the Project will result in a net increase of 39m^2 to instream habitat.

2.4 Restoration Planting and Post-Construction Monitoring

The MoTI will establish a detailed Restoration Planting Plan prior to construction that provides details of the number of each plant species and the areas where they will be planted. At this time, a list of plant species proposed for any restoration planting areas within the Project footprint is shown in Table A.

Table A: Proposed Planting List for Restoration Planting Areas

Common Name[1]	Scientific Name
Trees	
Douglas-fir	*Pseudotsuga menziesii*
Western hemlock*	*Tsuga heterophylla*
Western redcedar*	*Thuja plicata*
Bigleaf maple	*Acer macrophyllum*
Red alder*	*Alnus rubra*
Grand fir	*Abies grandis*
Shrubs	

[1] Plant species were chosen based on the dry maritime variant of the Coastal Western Hemlock (CWHdm) biogeoclimatic ecosystem classification zone suitability or based on the presence observed during PGL's site visit as indicated with "*".

Salal*	Gaultheria shallon
Dull Oregon-grape	*Mahonia nervosa*
Red huckleberry*	*Vaccinium parvifolium*
Baldhip rose	*Rosa gymnocarpa*
Thimbleberry*	*Rubus parviflorus*
Sword fern*	*Polystichum munitum*
Lady fern*	*Athyrium filix-femina*
Deer fern*	*Struthiopteris spicant*
Salmonberry*	*Rubus spectabilis*

Seed composition that will be spread within disturbed areas and restoration planting areas will follow the Standard Specifications for Highway Construction, Section 757 – Revegetation Seeding (MoTI, 2020)[2]

Any areas requiring planting, or that have been disturbed from the works adjacent to Gough or Clack Creeks, will be seeded with the Riparian Area Mix that consists of:

- Slender wheatgrass 40%;
- Perennial rye 25%;
- Kentucky bluegrass 15%;
- Timothy 10%;
- Redtop 5%; and
- Junegrass 5%.

Following construction and plant restoration works, the MoTI will implement a one-year post-construction monitoring program that includes monitoring the sites for:

- Structural stability;
- Fish passage and water flow;
- Planting and/or seed growth success; and
- Fish habitat use.

3.0 SITE DESCRIPTIONS

The following site descriptions are from PGL's site assessment visit in May 2022. The subsections below provide a detailed description of the two stream crossings. In addition to the below descriptions, additional site information can be found within PGL's previously completed Environmental Overview Assessment report, which has been appended to this Change Approval application as Appendix 8.

3.1 Overview of Day Road Sites

Day Road runs east-west while Gough and Clack Creeks run north-south. Gough Creek intersects Day Road at approximately 320m west of the Day Road and Clover Road intersection, and Clack Creek intersects Day Road at approximately 570m west of the Day Road and Clover Road intersection. The Gough Creek and Clack Creek stream crossings are roughly 250m apart from one another. Day Road is a short residential access road within the Sunshine Coast Regional District.

Both creeks are within the dry maritime variant of the Coastal Western Hemlock biogeoclimatic zone (CWHdm). The dominant canopy species consisted of mature western redcedar and western hemlock and subdominant red alder. Riparian vegetation is dominated by western redcedar, western hemlock, salal, lady fern, deer fern, and sword fern. Riparian cover was about 40%, and the creek margins featured red elderberry (*Sambucus racemosa*)

[2] Standard Specifications for Highway Construction, Section 757 – Revegetation Seeding. Ministry of Transportation and Infrastructure. 2020. Available at: 2020 Standard Specifications for Highway Construction Volume 1 of 2 (gov.bc.ca)

and western skunk cabbage (*Lysichiton americanus*). Please see the attached photos of the two stream crossing sites (Appendix 2).

3.2 Fish and Fish Habitat

Gough Creek is a tributary to Clack Creek, which in turn is a tributary to Roberts Creek, before discharging to the Salish Sea. The provincial database (Habitat Wizard) identifies a fish barrier waterfall of 3.3m to 3.4m high at the confluence of Clack Creek and Roberts Creek (Ministry of Environment, 2022). The waterfall is a complete barrier to fish movement; therefore, no anadromous species of fish would be present upstream of the waterfalls (i.e., at the Day Road stream crossings). However, the provincial database identifies two resident fish species, Cutthroat Trout (*Oncorhynchus clarkii*) and Dolly Varden (*Salvelinus malma*), as being present upstream of Day Road, which has also been confirmed by a local resident.

The MoTI Contractors have confirmed fish sightings in both Gough and Clack Creeks during their summer 2022 site assessments along Day Road. We presume the fish are either Dolly Vardan or Coastal Cutthroat Trout (*O. clarkii clarkii*). Fish habitat at the Sites is considered year-round, provided water quantity and water quality remains suitable through the summer season. Spawning habitat at the Sites is better suited to Dolly Varden, as substrates are cobbles with some gravel. However, patches of suitable gravel exist, providing limited spawning opportunities for Coastal Cutthroat Trout. Based on downstream flow gauge data from Roberts Creek, it is expected that both Gough Creek and Clack Creek have minimal flow during the summer months.

3.2.1 Gough Creek

The Gough Creek channel is well defined, with a typical width of 3m to 6m upstream of the crossing, widening to a maximum of 12m near the culvert inlet. The Gough Creek channel is 6m to 10m wide near the outlet and widens downstream to an approximately 40m-wide flood plain with a poorly defined 5m-wide channel. Gough Creek enters a temporary culvert (1.8m diameter) from the east-northeast and flows beneath Day Road at an approximate 3% gradient in a riffle/pool sequence.

The main channel of Gough Creek features moderate accumulations of large woody debris and ideal substrates for salmonid habitat. The substrates consisted of primarily round cobbles slightly embedded with gravels and minor sand in slower flow areas, and occasional small boulders. Downstream of the culvert, the right banks were significantly more disturbed, with exposed roots and undercutting along the margins of the watercourse. The watercourse cascades approximately 1.5m over riprap and bedrock and narrows before a cobble bar about 40m downstream. Beyond the cobble bar, the watercourse is confined by exposed bedrock.

3.2.2 Clack Creek

The Clack Creek channel is about 3m to 5m wide upstream and widens to a maximum 20m width near the culvert inlet. On the downstream side, the Clack Creek channel is 3m to 6m wide, with a floodplain that is approximately 50m wide. On the upstream side of Day Road, a large floodplain on river right (facing downstream) with grasses and forbs was present. Cobbles, sand, and woody debris were deposited through the low bank riparian between a small tributary to the northeast and the main channel. Debris and substrate deposition is assumed to have been due to the heavy rain events and flooding of fall 2021.

The riparian area was vegetated with sweet coltsfoot, step moss, western skunk cabbage, three-leaved foamflower, bedstraw, and invasive English ivy. Clack Creek meanders from the north, with several bends, in a riffle-pool sequence before entering the temporary culvert underneath Day Road. The creek featured cobble bars and sparse large woody debris. The temporary culvert outlets on the downstream side of Day Road and was perched about 0.2m above a plunge pool. Remnant sections of the original culvert were strewn through the creek and riparian areas. Erosion and rilling within the fill on the road above the temporary culvert was observed.

3.3 Species at Risk and Critical Habitat

There are no known occurrence records of federally listed aquatic Species at Risk or Species at Risk critical habitat directly upstream or downstream of the two Day Road stream crossings (Gough Creek or Clack Creek)

(BC Conservation Data Centre, 2022). Critical Habitat for marbled murrelet (*Brachyramphus marmoratus*) (*Species at Risk Act* Schedule 1 – Threatened) has been identified 2km to the northeast of the Sites. Marbled murrelet are seabird species that require old growth forest habitat containing trees with mossy limbs to serve as nesting platforms. PGL QEPs did not detect suitable marbled murrelet nesting habitat at the Day Road Sites during their environmental assessment visit in May 2022.

Coastal cutthroat trout are a Provincially Blue-Listed species.

There are no records of invasive aquatic species present in Gough or Clack Creeks.

4.0 POTENTIAL EFFECTS OF THE PROPOSED PROJECT

The Project aims to alter the size, shape, and type of culverts at the Sites; therefore, there may be minor alterations to fish habitat. Overall, the natural watercourse path, volume of flow, and grade will be maintained at both stream crossings. Culvert crossings and some riprap were already existing at the site prior to the atmospheric river event of November 2021. The Project will result in no net loss of riparian habitat, and a net increase of aquatic habitat, as described in Section 2.3.

4.1 Pathways of Effects:

The Project works were assessed for the potential to cause harmful alteration, disruption, or destruction of fish habitat following DFO's Pathways of Effects.

Potential residual effects from “Organic Debris Management” such as changes in habitat structure and cover are expected to be low. Most of the large woody debris and vegetation removal required to accommodate the Project works has already been disturbed during emergency works or the flooding event. Replanting to mitigate vegetation removal will occur post construction. The overall footprint for the Project is changing minimally from existing conditions to accommodate additional riprap stabilization (armouring).

Residual changes to nutrients are not anticipated, nor are changes in water temperature, change in food supply, or changes in dissolved oxygen.

Potential residual effects from “Placement of Material or Structures in Water” may occur; however, the site had culverts and riprap present prior to the flooding events, and this permanent design (the Project) does not result in land use changes. Therefore, we do not anticipate this Project resulting in the onset of any new residual effects associated with culvert and riprap placement within Gough or Clack Creeks at the Day Road crossings.

Potential negative residual effects from “Fish Passage Issues” are not expected as the Project will be conducted during the instream least-risk work window for the species anticipated at the Sites. Flow around the Sites will be maintained; however, fish passage will be temporarily prevented so the work area can be adequately isolated. In contrast, the replacement of the CSP culverts with concrete box culverts and fish baffles will improve fish passage within the watercourses in the long term, resulting in a net positive impact at the Sites.

Potential residual effects from “Use of Industrial Equipment” may occur. The removal of the existing culverts, debris, and fill materials has the potential to cause a temporary increase in suspended solids and turbidity downstream. This can be avoided and mitigated as described in the fish and fish habitat protection measures listed below. Heavy machinery will operate from above the top of bank, except where necessary to remove debris.

5.0 FISH AND FISH HABITAT PROTECTION MEASURES AND BEST MANAGEMENT PRACTICES FOR INSTREAM WORKS

The Project will incorporate the Fish and Fish Habitat Protection Measures provided within DFO’s Culvert Maintenance Interim Code of Practice, and will incorporate additional protection measures, which are listed below.

Protection of fish by:

- Scheduling instream works to respect timing windows to protect fish and fish habitat for Dolly Varden and Coastal Cutthroat Trout (combined least-risk window of August 1–August 31);
- Working outside of the reduced risk timing window is required; works will not extend past October 31 to protect amphibian and trout species potentially present within the site;
- Implementing mitigation measures to reduce potential impacts to spawning Dolly Varden should be implemented during works occurring outside of the fish window, including completing the initial diversion of the streams and increasing environmental monitoring frequency to the minimum of a daily inspection;
- Conducting works below the HWM during periods of low flow, and working in the dry;
- Limit the duration of works, undertakings, and activities below the HWM so that they do not diminish the ability of fish to carry out one or more of their life processes (e.g., spawning, rearing, feeding, migrating);
- Once instream works have begun, they will be pursued to completion as quickly as possible;
- Employing fish exclusion netting (up and downstream) and/or cofferdams to isolate the work site, ensuring a QEP conducts fish salvage of the isolated work zone prior to undertaking activities;
- Maintaining fish passage and appropriate depth and flow (i.e., base flow and seasonal flow of water) for the protection of fish; and
- Having a QEP onsite for the duration of Project works to conduct turbidity monitoring, search for presence of fish or other aquatic species around the work area, inspect exclusion netting, and monitor the instream works for fish or other aquatic species requiring capture and relocate outside of the excluded work zone.

Protection of the riparian zone by:

- Limiting access to shorelines and banks or areas adjacent to water bodies; and
- Maintaining riparian vegetation where possible (minor grubbing works may be required to accommodate road rebuilding/regrading).

- Following recommendations for tree removal and protection as prescribed in the Arborist Summary Report (Appendix 11)

Protection of fish habitat from sedimentation by:

- Installing effective erosion and sediment control measures to stabilize all erodible and exposed areas (as per the MoTI's Erosion and Sediment Control Manual, see attached);
- The Environmental Monitor will regularly inspect and ensure the Contractor maintains the erosion and sediment control measures during all phases of the Project;
- The Project will keep the erosion and sediment control measures in place until all disturbed ground has been permanently stabilized;
- Installing settling basin and/or filtration system for water flowing onto the site and water being pumped or diverted from the site, including:
    - Holding back runoff water until suspended sediment has resettled in the settling basin and runoff water is clear,
    - Dewatering gradually to prevent sediment resuspension and bank destabilization,
    - Disposing of and stabilizing all excavated material above the HWM or top of bank of nearby waterbodies, and ensuring sediment re-entry to the watercourse is prevented; and
    - Where possible, utilizing a vacuum truck for sediment removal instead of an excavator;
- Heeding weather advisories and scheduling work to avoid wet, windy, and rainy periods that may result in high-flow volumes and/or increase erosion and sedimentation;
- The Environmental Monitor will regularly monitor the watercourse for signs of sedimentation (turbidity monitoring) during all phases of the work, undertaking, or activity and taking corrective action if required;
- Stopping work and containing sediment-laden water to prevent dispersal; and
- Having heavy equipment operate from the paved roadway above top of bank.

Protection of fish and fish habitat from deleterious substances (including suspended sediment) by:

- Avoiding depositing any deleterious substances in the watercourse;
- Isolating concrete works from water flow and precipitation for a minimum of 48 hours after pouring to ensure concrete is cured prior to water contact;
- Monitoring of concrete works by a QEP including water quality sampling downstream of concrete works. Provision of easily accessible concrete mitigation measures such as CO2 with bubbling hose and silt curtains during concrete works;
- Following the Emergency Spill Response Plan provided within the Construction Environmental Management Plan (Appendix 5);
- Following the MoTI's Erosion and Sediment Control Manual for guidance measures to avoid sediment entering the stream;
- Ensuring an emergency spill kit is on site during all phases of the works, undertakings, and activities;
- Maintaining all machinery onsite in a clean condition and free of fluid leaks to prevent any deleterious substances from entering the water;
- Washing, refueling, and servicing machinery and storing fuel and other materials for the machinery in such a way as to prevent any deleterious substances from entering the water; and
- Disposing all waste materials (including construction, demolition, excavation, commercial logging) above the HWM of nearby waterbodies to prevent entry.

Additional measures for culvert maintenance including:

- Limit the removal of accumulated material and debris (e.g., branches, stumps, other woody materials, garbage, etc.) to the area within the culvert and immediately upstream and downstream of the culvert); and
- Remove accumulated materials and debris slowly to allow clean water to pass, to prevent downstream flooding, and to reduce the amount of sediment-laden water going downstream.

6.0 LANDOWNER APPROVALS AND INDIGENOUS CONSULTATION

Restoration activities require extension of works outside of the MOTI right-of-way. The MOTI is currently consulting with affected property owners and expect to forward landowner approvals to the MOF in Spring 2023.

Table C: Affected Properties and Proposed Requirements

Location	PID	Requirement
14007 Day Road		
	PID:007-798-237 (Doucet)	• Temporary License for Construction Access
	PID:007-325-126 (Dunkerton & Laird)	• Temporary License for Construction Access
	PID:007-798-172 (Palliardi)-	• Temporary License for Construction Access • Statutory Right of Way
	PID:030-318-785 (Vipond & McBride)-	• Temporary License for Construction Access

Indigenous consultation undertaken by the MoTI is summarized in the Record of Consultation (Appendix 9).

7.0 QEP SIGN-OFF FORM

PGL has completed a Key Aquatic Habitat Questions for Qualified Environmental Professionals (QEP Sign-Off Form) for the South Coast Region to accompany this Change Approval application (Appendix 10).

8.0 CLOSING

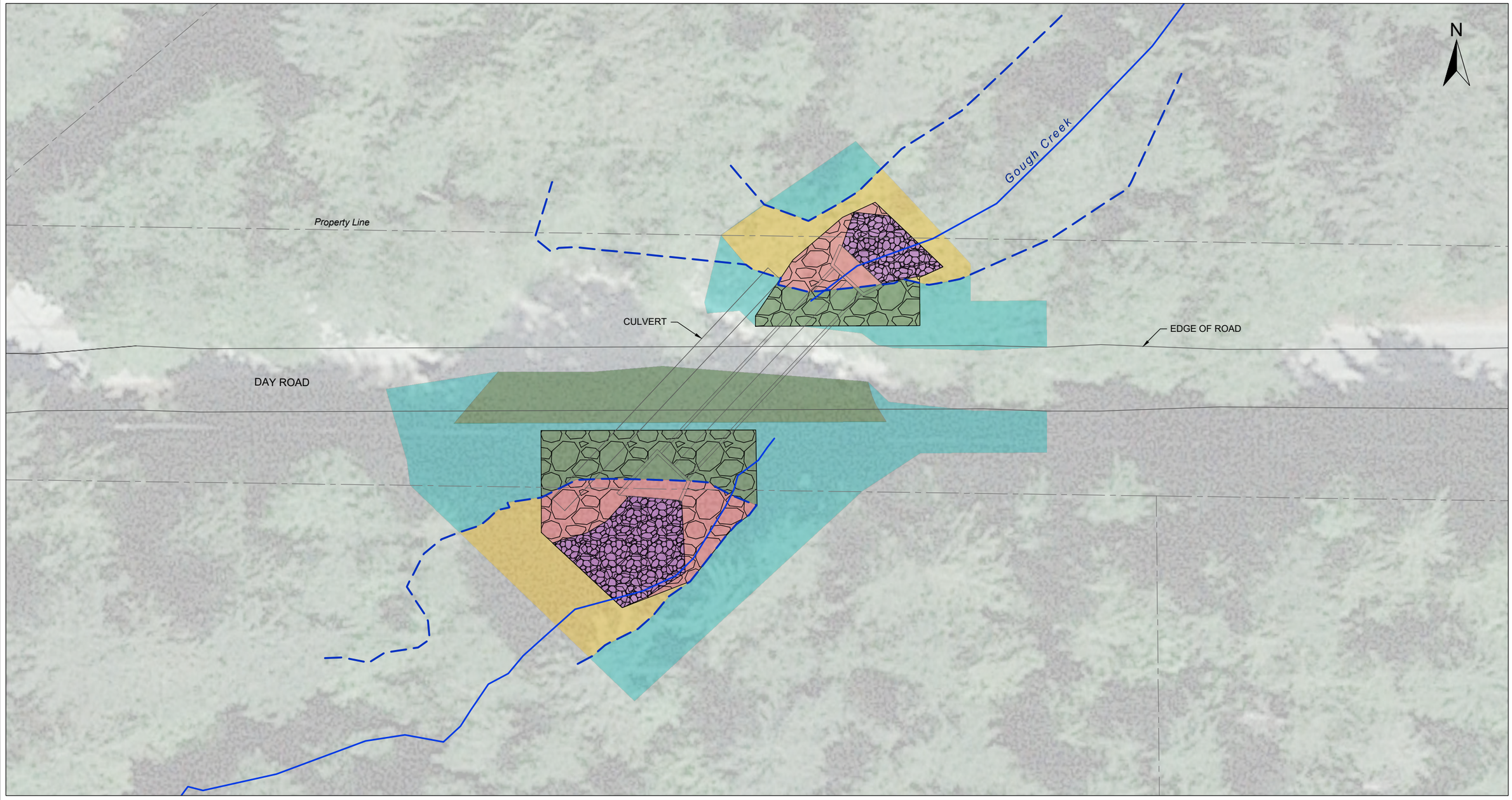
We trust this memo meets your needs. Should you have any further questions or require clarification, please contact Chloe Slomowitz or Stewart Brown at 604-719-1429 and 604-895-7612, respectively.

Attachments:
Appendix 1 – Site Location Figure
Appendix 2 – Site Photographs
Appendix 3 – Urban Systems Engineering Drawings
Appendix 4 – Erosion and Sediment Control Manual (MoTI)
Appendix 5 – Sunshine Coast Construction Environmental Management Plan (MoTI)
Appendix 6 – Requirements and Best Management Practices for Making Changes In and About a Stream in British Columbia (January 2022)
Appendix 7 – Day Road Habitat Balance Sheet
Appendix 8 – Day Road Environmental Overview Assessment
Appendix 9 – Record of Consultation
Appendix 10 – QEP Sign-Off Form

Appendix 1

Site Location Figure

PGL
ENVIRONMENTAL CONSULTANTS



Retained and Enhanced Instream Area (83 m²)
Permanent Instream Disturbance (83 m²)
Temporary Instream Disturbance (130 m²)
Permanent Riparian Disturbance on Washed Out Areas (237 m²)
Temporary Riparian Disturbance (409 m²)

Riprap
Cobbles
High Water Mark
Creek Centre Line

0 10 m

1:300

Referenced from Ministry of Transportation and Infrastructure Drawing; Day Road DFAA Flood Damage (February 2023). 2021 base image from Sunshine Coast Regional District, 2023. Features are approximate and are presented for discussion purposes only. WGS 1984 UTM Zone 10N.

GOUGH CREEK

Gough Creek at Day Road, Sunshine Coast Regional District, BC

MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE

PGL ENVIRONMENTAL CONSULTANTS

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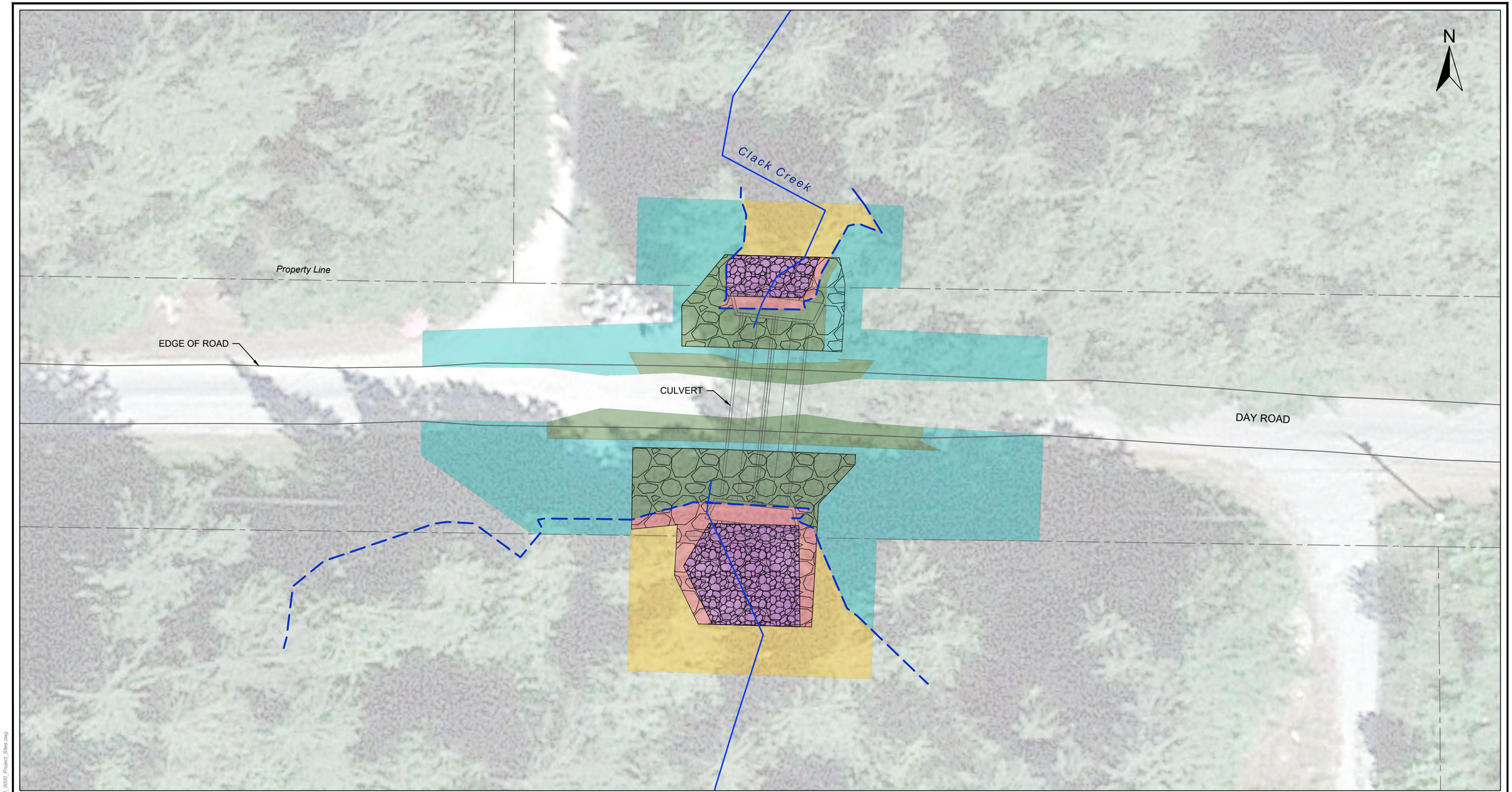

- Retained and Enhanced Instream Area (89 m²)
- Permanent Instream Disturbance (50 m²)
- Temporary Instream Disturbance (160 m²)
- Permanent Riparian Disturbance on Washed Out Areas (287 m²)
- Temporary Riparian Disturbance (522 m²)
- Riprap
- Cobbles
- High Water Mark
- Creek Centre Line

0 10 m

1:300

Referenced from Ministry of Transportation and Infrastructure Drawing; Day Road DFAA Flood Damage (February 2023). 2021 base image from Sunshine Coast Regional District, 2023. Features are approximate and are presented for discussion purposes only. WGS 1984 UTM Zone 10N.

CLACK CREEK

Clack Creek at Day Road, Sunshine Coast Regional District, BC

MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE

PGL ENVIRONMENTAL CONSULTANTS

File No.:	Dwg.:	Figure
0346-65.01	0050	5
Date: MAR 2023	Drawn By: TCM	

2cm

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Appendix 2

Site Photographs

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Appendix 3

Urban Systems Engineering Drawings

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Appendix 4

Erosion and Sediment Control Manual (MoTI)

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Appendix 5

Sunshine Coast Construction Environmental Management Plan (MoTI)

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Appendix 6

Requirements and Best Management Practices for Making Changes In and About a Stream in British Columbia (January 2022)

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Appendix 7

Day Road Habitat Balance Sheet

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HABITAT BALANCE

PREPARED BY: PGL Environmental Consultants; Chloe Slomowitz, R.P.Bio., & Katharine Scotton, R.P.Bio.	DATED: 14-Feb-2023	APPROVAL:

Stream (Please indicate each stream channel and/or reach of the stream)	Description of Works (Please describe type of works for indicated stream)	Stream Channel			Instream Impacts			Riparian Impacts		
		Length (m)	Width (m)	Riparian Setback (m)	Loss (m2)	Gain (m2)	Net (Loss-Gain) (m2)	Loss (m2)	Gain (m2)	Net (Loss-Gain) (m2)
Gough Creek culvert crossing under Day Road	**Instream**- rip-rap placement at culvert inlet and outfalls	41	13	30	**-83.00**	0.00	-83.00	0.00	0.00	0.00
Gough Creek culvert crossing under Day Road	**Instream-**retained and enhanced instream area with fisheries gravels	41	13	30	0	83.00	83.00	0.00	0.00	0.00
Gough Creek culvert crossing under Day Road	**Riparian**-temporary disturbance (clearing and grubbing) of riparian area that will be reseeded and/or planted	41	13	30	0.00	0.00	0.00	-409.00	409.00	0.00
Clack Creek culvert crossing under Day Road	**Instream**- rip-rap placement at culvert inlet and outfalls	38	17	30	-50.00	0.00	-50.00	0.00	0.00	0.00
Clack Creek culvert crossing under Day Road	**Instream-**retained and enhanced instream area with fisheries gravels	38	17	30	0.00	89.00	89.00	0.00	0.00	0.00
Clack Creek culvert crossing under Day Road	**Riparian**-temporary disturbance (clearing and grubbing) of riparian area that will be reseeded and/or planted	38	17	30	0.00	0.00	0.00	-522.00	522.00	0.00
IMPACT TOTAL					**-133.00**	**172.00**	**39.00**	**-931.00**	**931.00**	**0.00**
PROJECT NET LOSS/GAIN						**INSTREAM:**	**39.00**		**RIPARIAN:**	**0.00**

Comments:

Appendix 8

Day Road Environmental Overview Assessment

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Appendix 9

Record of Consultation

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Appendix 10

QEP Sign-Off Form

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