Development Permit Application

Referral Form – RDCK File DP2406A

Date: December 09, 2024

You are requested to comment on the attached DEVELOPMENT PERMIT for potential effect on your agency's interests. We would appreciate your response WITHIN 30 DAYS (PRIOR TO April 04, 2023). If no response is received within that time, it will be assumed that your agency's interests are unaffected.

LEGAL DESCRIPTION & GENERAL LOCATION:

10377 Highway 3A, Sanca
Lot 2 District Lot 4595 Kootenay District Plan 4523 (PID: 010-421-874)
Electoral Area 'A'

PRESENT USE AND PURPOSE OF PERMIT REQUESTED:

The subject property is located along the east shore of Kootenay Lake near Sanca. It is 1.21 hectares in size and is used for residential purposes. An accretion was recently completed for this property and the owners currently have two issued Environmentally Sensitive Development Permits (ESDPs) which address previous authorized and unauthorized works. In addition, a Development Variance Permit (DVP) was recently issued to permit the construction of a single storey boathouse within the rear lot line setback.

This ESDP application is required as a result of proposed development within the 15 metre ESDP (riparian) area adjacent to Kootenay Lake which include:

- constructing and replacing a retaining wall
- landscaping activities
- upgrading an existing water line for domestic water supply and fire suppression
- construction of a new single-story boathouse
- the replacement of a marine rail system

An Environmental Report by Keefer Ecological Services LTD has been submitted in conjunction with previous reports for the subject property to address the proposed development.

AREA OF PROPERTY AFFECTED	ALR STATUS	ZONING	OCP
0.18 hectare	N/A	Country Residential (R2)	Comprehensive Land Use Bylaw No. 2315 Country Residential (RC)

APPLICANT:

Bevan and Rhonda May

OTHER INFORMATION: ADVISORY PLANNING COMMISSION PLEASE NOTE:

If your Advisory Planning Commission plans to hold a meeting to discuss this Development Permit application, please note that the applicants must be provided with an opportunity to attend such meeting, in accordance with Section 461, subsection (8) of the *Local Government Act*, which reads as follows:

"If the commission is considering an amendment to a plan or bylaw, or the issue of a permit, the applicant for the amendment or permit is entitled to attend meetings of the commission and be heard."

Please fill out the Response Summary on the back of this form. If your agency's interests are 'Unaffected' no further information is necessary. In all other cases, we would appreciate receiving additional information to substantiate your position and, if necessary, outline any conditions related to your position. Please note any legislation or official government policy which would affect our consideration of this permit.

SADIE CHEZENKO, PLANNER

Nelson Office: Box 590, 202 Lakeside Drive, Nelson, BC. V1L 5R4
Phone: 250.352.6665 | Toll Free: 1.800.268.7325 (BC) | Email: info@rdck.ca | Fax: 250.352.9300

	REGIONAL DISTRICT OF CENTRAL KOOTENAY
☒ MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE ☒ HABITAT BRANCH (Environment) ☒ FRONTCOUNTER BC (MFLNRORD) ☐ AGRICULTURAL LAND COMMISSION ☐ REGIONAL AGROLOGIST ☐ ENERGY & MINES ☐ MUNICIPAL AFFAIRS & HOUSING ☒ INTERIOR HEALTH, HBE TEAM ☒ KOOTENAY LAKES PARTNERSHIP (FORESHORE DEVELOPMENT PERMITS) ☐ SCHOOL DISTRICT NO. ☐ WATER SYSTEM OR IRRIGATION DISTRICT ☒ UTILITIES (FORTIS, BC HYDRO, NELSON HYDRO, COLUMBIA POWER)	REGIONAL DISTRICT OF CENTRAL KOOTENAY DIRECTORS FOR: ☒ A ☐ B ☐ C ☐ D ☐ E ☐ F ☐ G ☐ H ☐ I ☐ J ☐ K ALTERNATIVE DIRECTORS FOR: ☒ A ☐ B ☐ C ☐ D ☐ E ☐ F ☐ G ☐ H ☐ I ☐ J ☐ K ☒ APHC AREA A ☒ RDCK FIRE SERVICES ☒ RDCK EMERGENCY SERVICES ☒ RDCK BUILDING SERVICES ☐ RDCK UTILITY SERVICES ☐ RDCK RESOURCE RECOVERY ☐ RDCK REGIONAL PARKS INSERT COMMENTS ON REVERSE . . .

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The personal information on this form is being collected pursuant to *Regional District of Central Kootenay Planning Procedures and Fees Bylaw No. 2457, 2015* for the purpose of determining whether the application will affect the interests of other agencies or adjacent property owners. The collection, use and disclosure of personal information are subject to the provisions of FIPPA. Any submissions made are considered a public record for the purposes of this application. Only personal contact information will be removed. If you have any questions about the collection of your personal information, contact the Regional District Privacy Officer at 250.352.6665 (toll free 1.800.268.7325), info@rdck.bc.ca, or RDCK Privacy Officer, Box 590, 202 Lakeside Drive, Nelson, BC V1L 5R4.

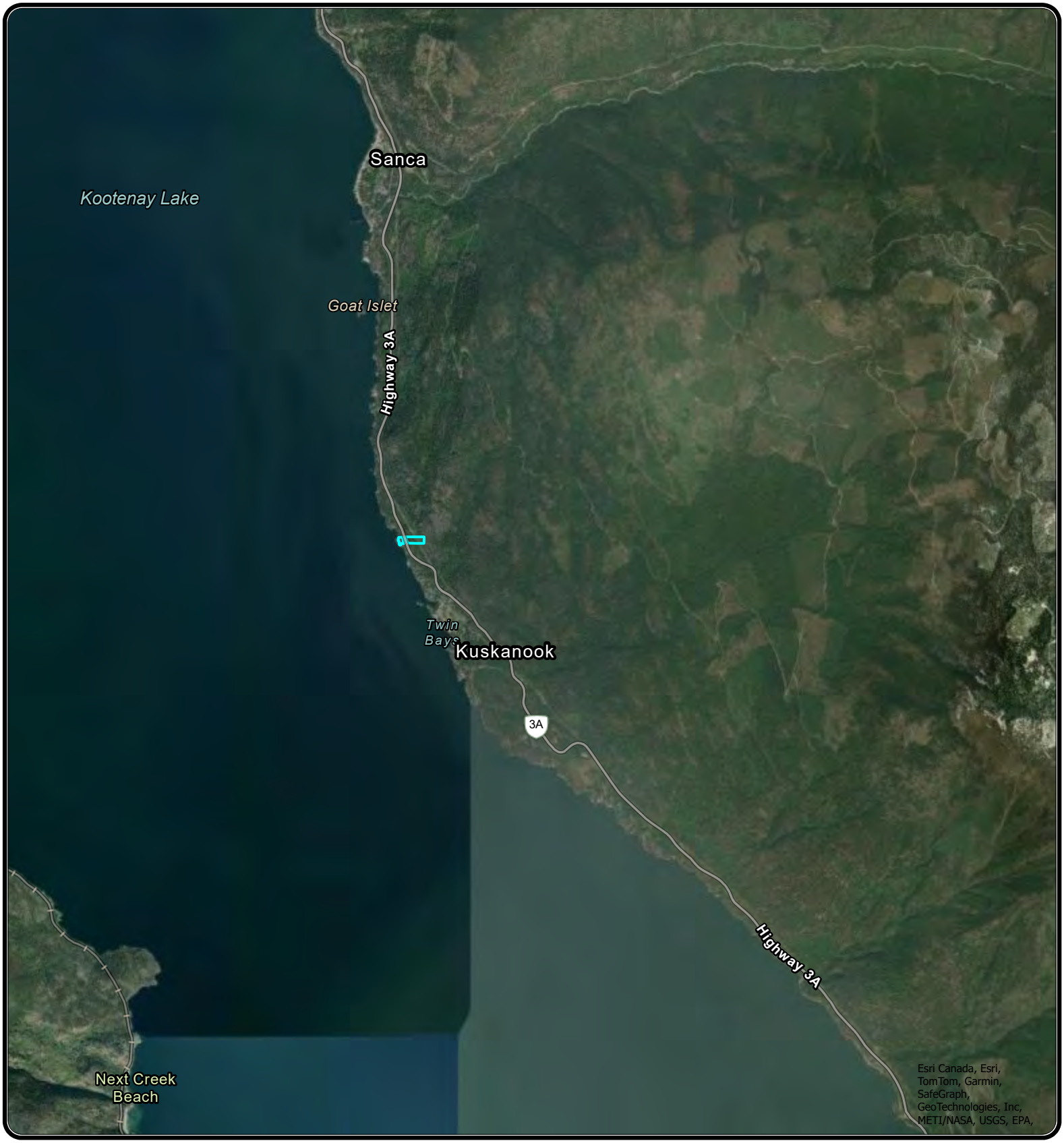
RESPONSE SUMMARY
FILE: DP2406A APPLICANT: BEVAN AND RHONDA MAY

Name: **Date:**

Agency: **Title:**

RETURN TO: SADIE CHEZENKO, PLANNER
DEVELOPMENT AND COMMUNITY SUSTAINABILITY SERVICES
REGIONAL DISTRICT OF CENTRAL KOOTENAY
BOX 590, 202 LAKESIDE DRIVE
NELSON, BC V1L 5R4
Ph. 250-352-1536
Email: plandept@rdck.bc.ca

RDCK Map



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Phone: 1-800-268-7325 www.rdck.bc.ca
maps@rdck.bc.ca

Legend

Electoral Areas

Map Scale:

1:72,224

Date: December 9, 2024

The mapping information shown are approximate representations and should only be used for reference purposes. The Regional District of Central Kootenay is not responsible for any errors or ommissions on this map.

RDCK Map

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Legend

- Electoral Areas
- RDCK Streets
- Cadastre - Property Lines
- Address Points

Map Scale:

1:2,257

N W E S

Date: December 9, 2024

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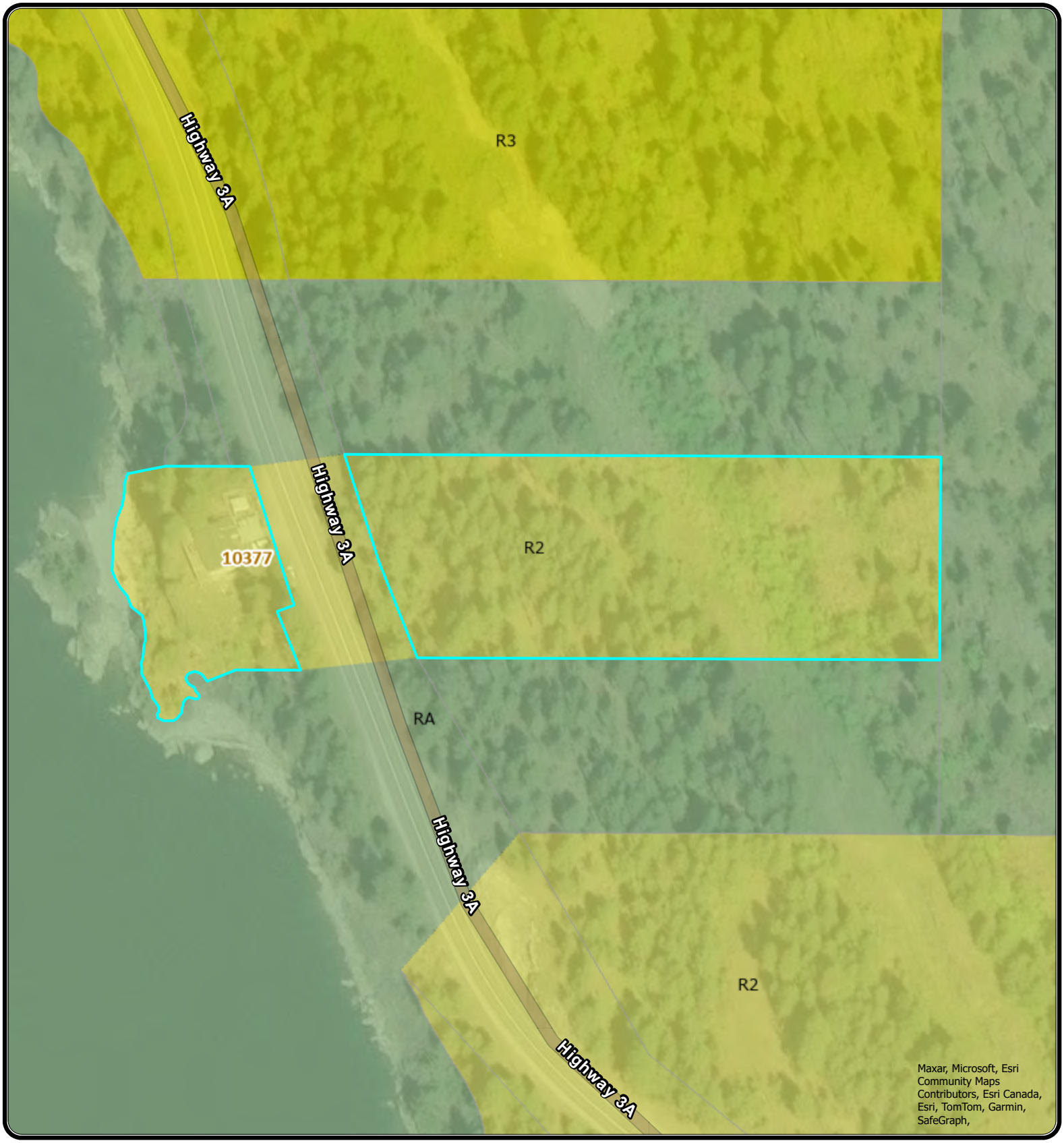
RDCK Map



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Zoning Class

- Residential 2
- Residential 3
- Resource Area

Legend

- Electoral Areas
- Cadastre - Property Lines
- Address Points

Map Scale:

1:2,257

Date: December 9, 2024

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RDCK Map

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Official Community Plan

- Country Residential
- Resource Area

Legend

- Rural Residential
- Electoral Areas
- Cadastre - Property Lines
- Address Points

Map Scale:

1:2,257

Date: December 9, 2024

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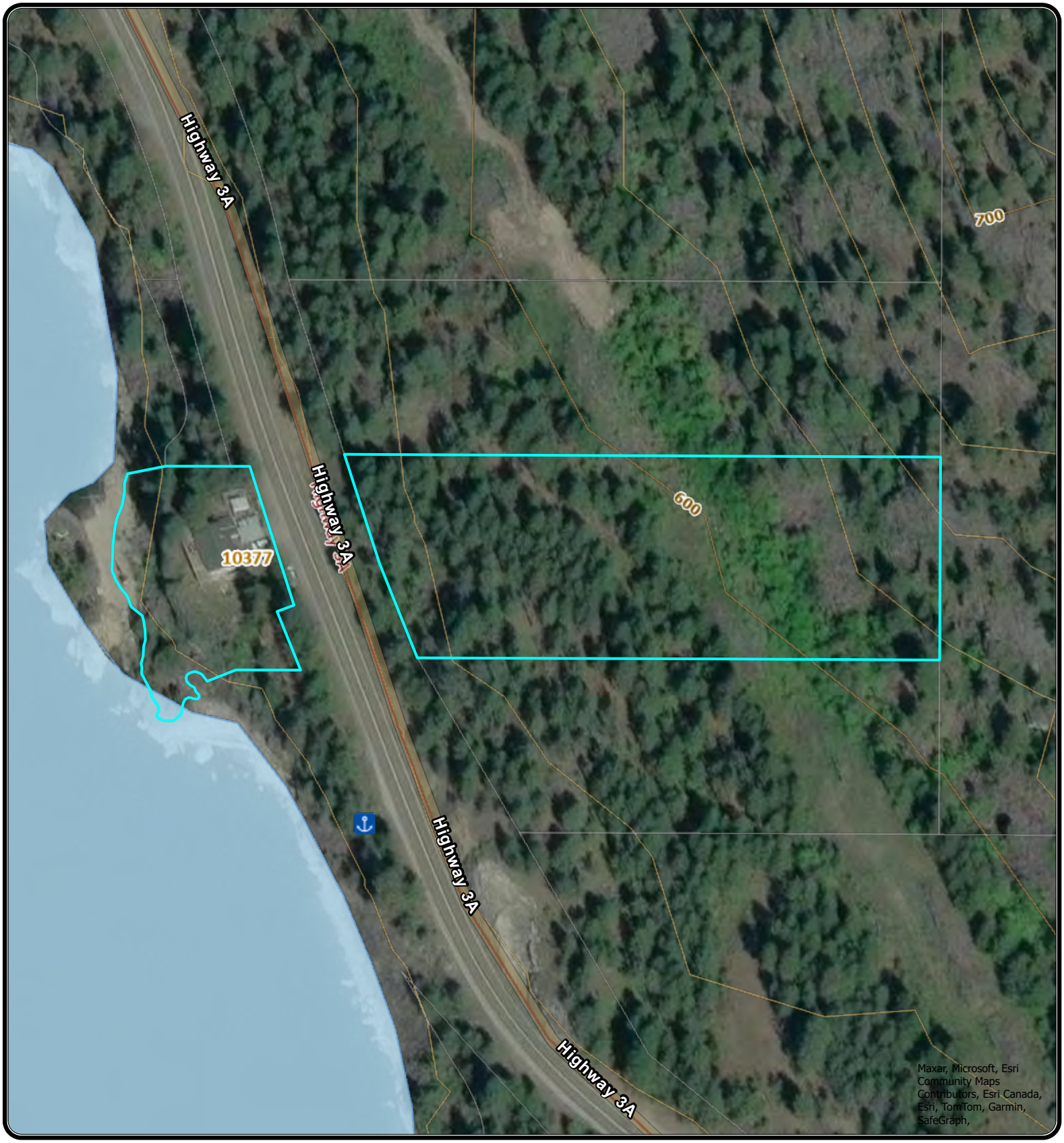
RDCK Map



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20 Meter Contours

- 20 meter
- 100 meter
- Lakes and Rivers
- Streams and Shorelines

Legend

- Water Front Access
- Electoral Areas
- RDCK Streets
- Cadastre - Property Lines
- Address Points

Map Scale:

1:2,257

Date: December 9, 2024

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RDCK Map

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Legend

- Building Footprints
- Flood Construction Levels - 1990
- Electoral Areas
- Cadastre - Property Lines
- Address Points

Map Scale:

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Development Permit Areas

- Environmentally Sensitive

Legend

- Residential Cluster
- Electoral Areas
- Cadastre - Property Lines
- Address Points

Map Scale:

1:2,257

N W E S

Date: December 9, 2024

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16.0 DEVELOPMENT PERMIT AREAS

Background

The OCP may designate Development Permit Areas under the authority of local government legislation. Unless otherwise specified, a development permit must be approved by the Regional Board, or delegate of the Board, prior to any development or subdivision of land within a designated Development Permit Area.

Development Permit Areas allow for implementation of special guidelines for the protection of the natural environment, protection from hazardous conditions, for revitalization of designated areas, or to guide the form and character of development within the Plan Area. Development Permit Areas can also be used to meet targets for carbon emission reductions and energy and water conservation.

Where land is subject to more than one Development Permit Area designation, a single development permit is required. The application will be subject to the requirements of all applicable Development Permit Areas, and any development permit issued will be in accordance with the guidelines of all such Areas.

Development Permit Area #1: Environmentally Sensitive Development Permit (ESDP) Area

Category

The ESDP area is designated under Section 488.1(1) (a) of the *Local Government Act* for the protection of the natural environment, its ecosystems and biological diversity.

Justification

The primary objective of this Development Permit Area designation is to regulate development activities in watercourses, lakes and wetlands and their adjacent riparian areas so as to protect aquatic habitat; and to conserve, enhance and, where necessary, restore watercourses and their riparian areas.

Area

The ESDP area is comprised of:

1. Riparian assessment areas (Figure 1) for fish and wildlife habitat and drinking water, including:
    a. All areas within 15 metres of the high water mark of a watercourse, including the natural boundary of a lake;
    b. within 15 metres of the top of the ravine bank in the case of a ravine less than 60 metres wide; and
    c. within 5 metres of the top of the ravine bank in the case of a wider ravine that links aquatic to terrestrial ecosystems and includes both existing and potential riparian

vegetation and existing and potential upland vegetation that exerts an influence on the watercourse.

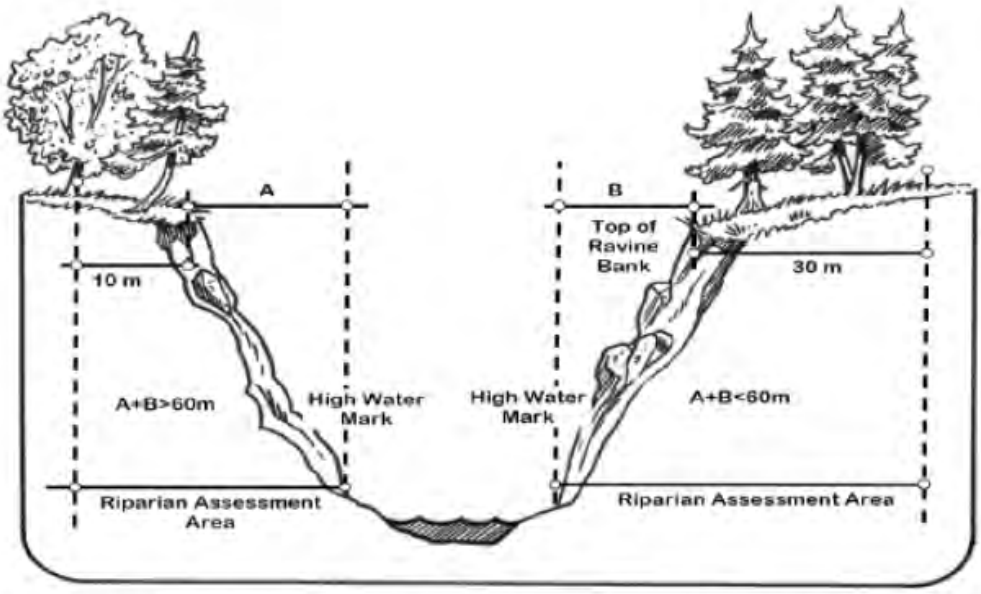

FIGURE 1: (for illustrative purposes only) RIPARIAN ASSESSMENT AREA: means the area within 15 m of the high water mark of a watercourse; within 15 m of the top of the ravine bank in the case of a ravine less than 60 m wide; and within 5 m of the top of the ravine bank in the case of a wider ravine that link aquatic to terrestrial ecosystems and includes both existing and potential riparian vegetation and existing and potential upland vegetation that exerts an influence on the watercourse. This DPA applies only to residential, commercial and industrial designations.

Source: British Columbia Ministry of Environment, *Riparian Areas Regulation Implementation Guidebook*, March 2005

Where the following definitions apply:

High water mark means the visible high water mark of a watercourse where the presence and action of the water are so common and usual, and so long continued in all ordinary years, as to mark on the soil of the bed of the watercourse a character distinct from that of its banks, in vegetation, as well as in the nature of the soil itself, and includes the active floodplain.

Lake means any area of year round open water covering a minimum of 1.0 hectares (2.47 acres) of area and possessing a maximum depth of at least 2.0 metres. Smaller and shallower areas of open water may be considered to meet the criteria of a wetland.

Top of ravine bank means the first significant break in a ravine slope where the break occurs such that the grade beyond the break is greater than 3:1 for a minimum distance of 15 m measured perpendicularly from the break, and the break does not include a bench within the ravine that could be developed.

Watercourse means any natural or man-made depression with well-defined banks and a bed 0.6 metres (2.0 feet) or more below the surrounding land serving to give direction to a current of water at least six months of the year and/or having a drainage area of two square kilometres (0.8 square miles) or more upstream of the point of consideration.

Wetland means any areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas.

Guidelines

A development permit is required, except where specified under the exemptions section, for development or land alteration on land identified as a riparian assessment area within the ESDP Area. Where not exempt, development requiring a development permit includes any of the following associated with or resulting from residential, commercial or industrial activities or ancillary activities to the extent that they are subject to local government powers under local government legislation or when triggers by the requirements of a building permit or subdivision approval:

a. removal, alteration, disruption or destruction of vegetation;
b. disturbance of soils;
c. construction or erection of buildings and structures;
d. creation of non-structural impervious or semi-impervious surfaces;
e. flood protection works;
f. construction of roads, trails, docks, wharves and bridges;
g. provision and maintenance of sewer and water services;
h. development of drainage systems;
i. development of utility corridors; and
j. subdivision as defined in section 455 of the *Local Government Act*;

Development shall be in accordance with the following guidelines:

2. All development proposals subject to this permit will be assessed by a Qualified Environmental Practitioner (QEP) or Registered Professional Biologist (RP Bio) in accordance with the Riparian Areas Regulation established by the Provincial and/or Federal governments as used elsewhere in the Province;
3. An ESDP shall not be issued prior to the RDCK ensuring that a QEP or RP Bio has submitted a report certifying that they are qualified to carry out the assessment, that the assessment methods have been followed, and provides in their professional opinion that a lesser setback will not negatively affect the functioning of a watercourse or

riparian area and that the criteria listed in the Riparian Areas Regulation has been fulfilled, and;

4. The Riparian Areas Regulation implemented through the ESDP does not supersede other Federal, Provincial and or local government requirements, including that of other development permit areas, building permits, flood covenants, Federal or Provincial authorization. Land subject to more than one development permit area designation must ensure consistency with the guidelines of each development permit area, to provide comprehensive stewardship of both fish and wildlife habitat.

Exemptions

The ESDP area does not apply to the following:

5. existing construction, alteration, addition, repair, demolition and maintenance of farm buildings and agricultural activities including clearing of land for agricultural purposes;
6. existing institutional development containing no residential, commercial or industrial aspect;
7. construction, renovation, or repair of a permanent structure if the structure remains on its existing foundation. Only if the existing foundation is moved or extended in to a riparian assessment area would a ESDP be required; and
8. an area where the applicant can demonstrate that the conditions of the ESDP Area have already been satisfied or a development permit for the same area has already been issued in the past and the conditions in the development permit have all been met, or the conditions addressed in the previous development permit will not be affected.

Development Permit Area #2: Residential Cluster Development Permit (RCDP) Area

Designation

The RCDP area is designated under Section 488.1(1) (a) and (e) of the *Local Government Act* for protection of the natural environment, its ecosystems and biological diversity and the establishment of objectives for the form and character of intensive residential development.

Area

The RCDP Area is comprised of all privately owned or leased lands designated as Suburban Residential (RS), Country Residential (RC), Multi-Family Residential (RM), and Mixed Use Residential (RMU) on Schedule 'A.1'.

Justification

The intent of the RCDP Area is to ensure that intensive residential development is completed in a manner that is sensitive to the rural character of the Plan area, adjoining lands, the natural environment, and achieves a high standard of appearance. Lands in the Plan Area have not been studied to a high level for their ability to sustain intense development over the long term. It is therefore desirable to allow development to occur in a manner which allows for efficient

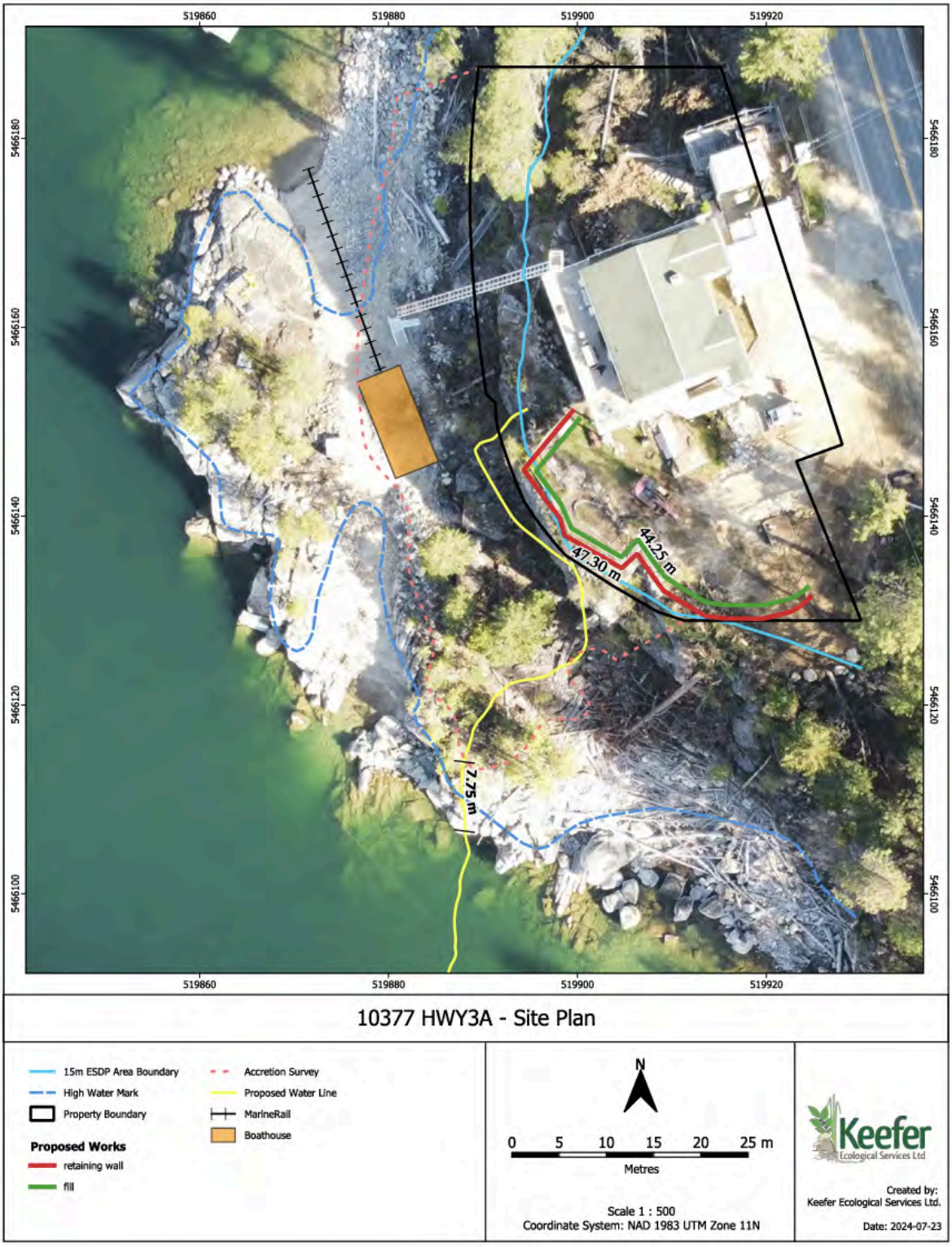

Figure 2. Site plan for proposed works.

Environmental Report

Retaining Wall, Water Supply Upgrade, & Boathouse Construction

10377 Highway 3A, Gray Creek, BC

Mikayla Davis, BIT; Michael Keefer, PAg; Muhammad Arslan, PBiol

August 2, 2024

Keefer Ecological Services Ltd.
217B Industrial Rd F
Cranbrook, BC V1C 6N4
(250) 489-4140
www.keefereco.com

Overview

The assessed property is located at 10377 Highway 3A in Gray Creek, BC, on the east shore of Kootenay Lake. This report has been prepared for the Regional District of Central Kootenay (RDCK) as a pre-condition for issuing an Environmentally Sensitive Development Permit. This report is included as part of a Development Permit, as required under section 920 of the Local Government Act, and will be filed on the title of the assessed property. The report has been prepared for and at the expense of the owner of the assessed property. The authoring Qualified Environmental Practitioners (QEPs) have not acted for or as an agent of the RDCK and have followed provincially and federally recognized best management practices. RDCK may reply upon the QEP's recommendations for development and use of the property in a way that is consistent with the Development Permit Area.

This report has been prepared by Keefer Ecological Services Ltd. (KES) concerning the proposed construction and replacement of a retaining wall and landscaping activities along the clifftop rim adjacent to the Environmentally Sensitive Development Permit (ESDP) area/natural lake boundary. Additionally, the property will be updating an existing water line for domestic water supply and fire suppression and proposed construction of a new boathouse and the subsequent replacement of a marine rail system.

This Environmental Report is believed to meet the stipulated requirements set by RDCK's development permit application guidelines and terms of reference. The following documents (**Appendices A, B, C, and D**) are believed to meet the stipulated requirements set by RDCK's development permit application guidelines and terms of reference:

- Riparian Area Assessment Report – submitted on January 13, 2022 and November 22, 2022
- Riparian Area Management Plan– submitted on January 13, 2022 and November 22, 2022
- Remediation Plan – submitted on November 22, 2022
- Environmental Monitoring Report– submitted on July 10, 2023

In the professional opinion of the QPs, the activities outlined in this report should not cause any harmful alteration, disruption or destruction of natural features, functions, and conditions that support fish life processes in the riparian assessment area.

Michael Keefer, PAg #1927 Keefer Ecological Services Ltd.	Mikayla Davis, BIT #4430 Keefer Ecological Services Ltd.	Muhammad Arlsan, PBiol #6470 Keefer Ecological Services Ltd.

Project Description

This report provides an environmental assessment for the proposed retaining wall, water line upgrades, boathouse construction and the subsequent replacement of a marine rail system at 10377 Highway 3A, Gray Creek, BC. The assessment includes constructing and replacing a retaining wall, landscaping activities, upgrading an existing water line for domestic water supply and fire suppression, construction of a new one-story boathouse, and replacement of a marine rail system. The report is prepared as a pre-condition for issuing an Environmentally Sensitive Development Permit that is compliant with RDCK guidelines and terms of reference and has been prepared at the property owner's expense.

Previous works through the RDCK and Province of BC have taken place: The following activities have been completed on-site by external contractors:

- Riparian Area Assessment on March 15, 2021 (KES)
- Construction monitoring on March 14, 2022 (KES)
- Remediation assessment on June 20, 2022 (KES)
- Remediation assessment on March 7, 2023 (KES)
- Construction monitoring on March 16, 2023 (KES)
- Construction monitoring on March 25, 2023 (KES)
- Land survey on May 24, 2023 (Griffith Land Surveying Inc.)
- Construction monitoring on June 14, 2023 (KES)

Professional Qualifications

The report has been prepared by the following Qualified Environmental Practitioners (QEPs):

Michael Keefer, Professional Agrologist (PAg) #1927: Michael Keefer, a registered Professional Agrologist with the British Columbia Institute of Agrologists (BCIA), specializes in environmental impact assessment, mitigation planning, reclamation planning and management, and vegetation identification. He has experience conducting Riparian Area Assessments and ensuring project compliance with regulations, including those in the Regional District of Central Kootenay (RDCK). Michael

Mikayla Davis, Biologist in Training (BIT) #4430: Mikayla Davis is a dedicated Biologist at Keefer Ecological Services (KES), holding credentials as a Biologist-in-Training recognized by the College of Applied Biology in British Columbia. Mikayla brings extensive expertise to conducting Riparian Area Assessments through her comprehensive understanding of regulatory frameworks, which allows her to navigate and ensure effective compliance with provincial and municipal guidelines. Mikayla collaborates closely with multidisciplinary teams at KES, including Professional Agrologists, Foresters, and Biologists, to deliver robust assessments that support sustainable land use practices.

Muhammad Arslan, Professional Biologist (PBiol) #6470: Muhammad Arslan is a Professional Biologist through the Alberta Society of Professional Biologist. He brings specialized expertise in water quality and freshwater ecosystems. Muhammad envisions harnessing these integral ecosystem components for genuine ecological rejuvenation. His approach is grounded in Environmental Impact Assessments, ensuring a proactive and sensitive stance to ecological complexities.

General Requirements

The QEPs have ensured that the report meets RDCK's development permit application guidelines and terms of reference. The report includes detailed site assessments, proposed developments, and mitigation measures to ensure minimal environmental impact.

Riparian Assessment

Site Context

The property, approximately 3 hectares, is located at 10377 Highway 3A, Gray Creek, BC, on the east shore of Kootenay Lake. The legal description is Lot 2 Plan NEP4523 District Lot 4595 Land District 26 (Kootenay). The PID is 010-421-874. The current owner is Bevan May.

Site Description

Topography: The site is characterized by gently sloping terrain leading down to the lake shore, with a gradient of approximately 15%. The slope is stable but has areas of moderate erosion due to runoff.

Soil Composition: Predominantly sandy loam with areas of clay loam. Soil stability is generally good, but there are some sections where erosion control measures will be necessary.

Vegetation: The riparian area vegetation of the assessed property and adjacent properties is predominantly dry conifer forest, which sometimes extends to the HWM but does not overhang the waterbody. Most vegetation is contained to the bank's top as the exposed bedrock cliffs are steep and soil-free. Very little vegetation in the riparian area on the assessed property and neighbouring properties has been modified through clearing activities or other anthropogenic factors.

The site includes a mix of native and invasive species, including:

- Ponderosa pine (*Pinus ponderosa*),
- Douglas fir (*Pseudotsuga menziesii*),
- Oregon grape (*Mahonia aquifolium*),
- common juniper (*Juniperus communis*),
- Wood's rose (*Rosa woodsii*),
- yarrow (*Achillea millefolium*),
- round-leaved alumroot (*Heuchera cylindrica*),
- falsebox (*Pachistima myrsinites*),
- spotted knapweed (*Centaurea stoebe*),
- and Scotch broom (*Cytisus scoparius*).

Wildlife Habitat: The area provides habitat for various bird species, small mammals, and occasional deer sightings. No critical habitats or species at risk have been identified within the project area.

Riparian Condition

Riparian Zone: The riparian area along Kootenay Lake is characterized by dense vegetation, including willow (*Salix spp.*), red-osier dogwood (*Cornus sericea*), and black cottonwood (*Populus trichocarpa*). The zone extends approximately 10-15 meters from the high-water mark.

Aquatic Habitat: The nearshore aquatic habitat includes submerged vegetation and provides spawning and rearing habitat for fish species such as rainbow trout (*Oncorhynchus mykiss*) and kokanee salmon (*Oncorhynchus nerka*). Kootenay Lake is a fish-bearing waterbody managed for angler use and supports many different fish species, both native and invasive, including:

- longnose dace,
- torrent sculpin,
- rainbow trout,
- kokanee,
- slimy sculpin,
- brook trout,
- mountain whitefish,
- redside shiner,
- peamouth chub,
- northern pikeminnow,
- bull trout,
- white sturgeon,
- pygmy whitefish,
- yellow perch,
- burbot,
- westslope cutthroat trout,
- longnose sucker,
- leopard dace,
- largescale sucker,
- prickly sculpin,
- bridgelip sucker,
- lake whitefish,
- dolly varden,
- carp,
- pumpkinseed,
- and largemouth bass.

Known critical fish habitats in Kootenay Lake include spawning, rearing, living, and foraging areas and migration corridors.

Water Quality: Water quality in Kootenay Lake is generally high, with parameters such as turbidity, temperature, and dissolved oxygen within acceptable ranges for aquatic life.

Shoreline Conditions: The shoreline at the assessed property is rocky, with no woody debris observed along the shoreline below the high-water mark (HWM). This observation is consistent with adjacent properties. Above the HWM, extensive amounts of woody debris were observed, naturally accumulating in pools and bays along the shoreline upstream and downstream of the assessed property. No turbulent water features (e.g., riffles, cascades), undercut banks, or in-stream vegetation were observed along the shoreline of the assessed property or adjacent properties. The Kootenay Lake Shoreline Guidance Document (Kootenay Lake Partnership, 2020) assessed this shoreline segment as having low potential for aquatic habitat for the species listed, except for juvenile rearing habitat. Bird habitat potential was also observed. The field assessment did not yield evidence of nests, although tree nesting habitat exists up and downstream of the assessed property. No evidence of raptors has been observed.

Table 1. Kootenay Lake shoreline habitat assessment summary (Kootenay Lake Partnership, 2021).

Habitat Assessed	Habitat Potential	Habitat Assessed	Habitat Potential
White sturgeon spawning	No	Red- or Blue-listed species	Yes
Bats	No	Fish staging	No
Raptors	Yes	Fish migration	No
Heron	No	Salmon spawning	No
Nests	Yes	Juvenile rearing	Moderate
Amphibians	No	Kokanee spawning	No

BC Riparian Area Protection Regulation Standards:

Assessment Methods: The assessment follows the BC Riparian Area Protection Regulation (RAPR) methods, which include evaluating the site for potential impacts on riparian functions, determining the Streamside Protection and Enhancement Area (SPEA), and recommending measures to protect and enhance riparian functions.

SPEA Width Calculation: The SPEA was determined to be 15 m as directed by the RDCK for Electoral Areas A per the Official Community Plans (Regional District of Central Kootenay, 2021) for maintaining riparian function and protecting aquatic habitat. The riparian area measurement was based on mapping provided by the surveyor, using the location of the high-water mark (Figure 1).

Vegetation Protection: The riparian vegetation will be preserved to the greatest extent possible. Given that the proposed plan will not impact riparian vegetation, no additional protection measures are required.

Figure 1. SPEA determination for the assessed property.

Proposed Development

The project involves replacing a retaining wall and upgrading an existing water supply line. The upgrade will span within and beyond the ESDP area boundary to facilitate domestic water use and fire suppression (see Figure 2). The project also involved the construction of a new boathouse and replacement of the marine rail system. Based on the field activities, it is argued that:

- Disturbance: There will be no additional disturbances beyond the already impacted area, ensuring minimal environmental impact as previously determined.
- Vegetation: No impact on vegetation will occur due to the construction or associated activities, maintaining the ecological integrity of the riparian zone.
- Water Bodies: No impact on water bodies will occur due to the construction or associated activities of the retaining wall, water line or boathouse construction. A schedule 11 application will address any concerns related to work around the water body for the marine rail system installation.

Development Details

Retaining Wall

The new retaining wall will be constructed using environmentally friendly materials that blend with the natural landscape. The wall's height and length will be similar to the existing structure to maintain slope stability and prevent erosion. The new retaining wall will be constructed within a previously disturbed area, serving as a replacement for the existing structure. Notably, most of the new retaining wall will be situated beyond the 15-meter threshold from the ESDP area/natural lake boundary, with only a small section in the north encroaching upon this boundary (Figure 2). The overlap of the new retaining wall with the natural lake boundary will not significantly impact the riparian habitat due to the considerable elevation difference between the cliff top and the surrounding riparian zone. Positioned approximately 20-25 meters above the riparian area, the cliff top's impact on the functionality of the riparian habitat is minimal.

Given this significant vertical separation, the small overlap of the retaining wall with the lake boundary is unlikely to affect the riparian habitat directly. The functionality and ecological processes within the riparian zone are primarily influenced by factors such as water quality, vegetation composition, and hydrological dynamics rather than a retaining wall at a higher elevation. Therefore, it can be reasonably concluded that the proposed retaining wall's overlap with the natural lake boundary will have negligible consequences on the riparian habitat. The strategic positioning of the new retaining wall ensures that there will be no further disturbances to the environment or the surrounding vegetation.

- Dimensions: Approximately 50 meters in length and 1.5 meters in height.
- Materials: Reinforced earth with native stone facing to enhance visual integration with the environment.

- Construction Method: The wall will be constructed using a modular block system that allows for flexibility in design and minimizes environmental impact.

Water Line Upgrade

The current water line and pump, which are over 50 years old and predate the property's current ownership, raise concerns about their effectiveness and durability. Consequently, the decision to upgrade the water line and pump has been made. It is our understanding that the property owner has applied for a water license to withdraw water from this upgraded system. Upgrading the water line and pump will entail minimal disruption to the riparian habitat, as it involves no vegetation removal, use of fill, ground disturbance, and minimal manual movement of coarse woody debris. Consequently, it is reasonable to conclude that the environmental impacts of the water line and pump upgrade will be minimal.

- Decommissioning Existing Line: The existing water line will be capped, and the old pump will be removed from the lake.
- New Pump Installation: The new pump will be installed within 15 meters of the property boundary line to comply with regulations set by the Ministry of Water, Land, and Resource Stewardship, aligning with the standards observed in previous ecological assessments.
- New Water Line Installation: The new water line will be laid on the ground's surface to avoid ground disturbance and secured to the cliff face. The line will not be filled or covered.
- Clearing for Installation: Only minimal manual clearing of coarse woody debris within a 1-meter right-of-way on either side of the line will be undertaken, without the use of machinery, consistent with the minimal disruption approach adopted in previous ecological assessments.

Boathouse & Rail System

Construction will result in a 16’ x 36’ one-story boathouse. The boathouse will be used for boat, water toy and general storage. The boathouse will be devoid of plumbing or sewer installations. Following the completion of the boathouse, a replacement marine rail system will be introduced. The rail system's installation will involve positioning rail support/levelling blocks without requiring additional disturbances to the existing pathway.

The boathouse construction will be located within a previously disturbed area. The area previously held a boathouse with compromised structural integrity. During construction activities related to DP 2115A, the property owner removed the boathouse in March of 2022. KES evaluated the decommissioning of the boathouse and determined that it did not impose adverse effects on the environment, and remediation was not required.

The strategic positioning of the new boathouse ensures that there will be no further disturbances to the environment or the surrounding vegetation.

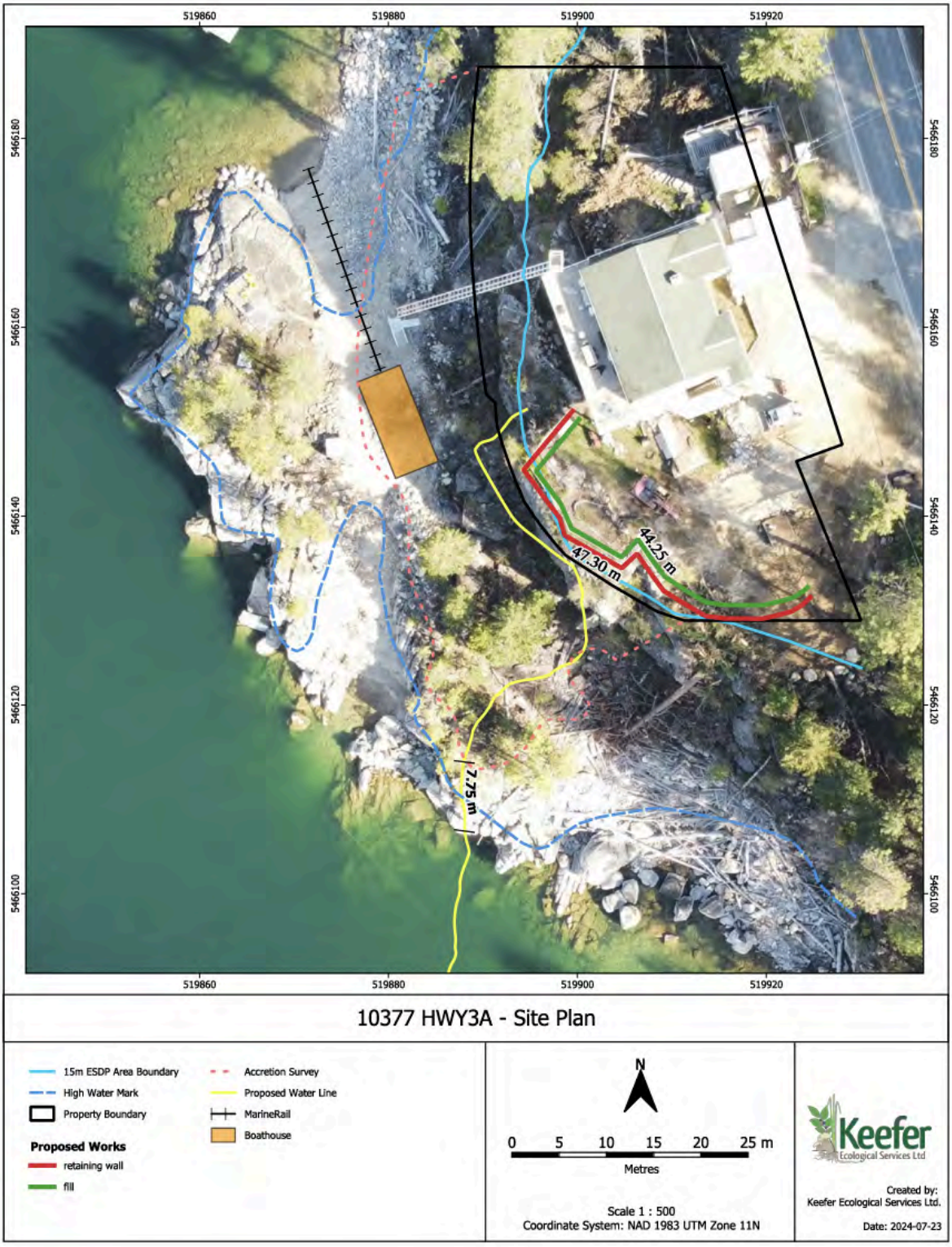

Figure 2. Site plan for proposed works.

Mitigation Measures & QP Recommendations

The following proposed management and mitigation measures are intended to ensure no adverse effects on the terrestrial or aquatic habitat or drinking water quality through the work. These management and mitigation measures will be implemented throughout the proposed work by the property owner with assistance from a QEP.

Communication Plan

All site personnel will be informed of their obligation to protect the terrestrial, aquatic and drinking water values at the assessed property through the proposed work. This includes limiting disturbance footprints within the SPEA. Spill response, if required, will follow provincial guidelines.

Equipment

Cleaning procedures will be implemented for all incoming equipment, including footwear, to avoid the introduction of both terrestrial and marine invasive plant species. Equipment will not be permitted to work on the assessed property if it is not free from mud, debris, vegetation, etc.

Invasive Plant Control

Two invasive plant species were observed on the assessed property and are presumed to have originated from populations along the side of the highway. These species were also observed 200 m up and downstream of the assessed property. Spotted knapweed (*Centaurea stoebe*) should be manually removed and chemically controlled, with extra care taken in its application, given the proximity to the high-water mark. Existing spotted knapweed skeletons should be carefully removed in such a manner that it reduces the likelihood of spreading seeds during the process. Scotch broom (*Cytisus scoparius*) should also be removed manually. Plants should be dug or pulled, removing as much of the root as possible. Scotch broom may also be controlled via chemical means in the spring.

Dust Control

Where concrete or bedrock is cut, drilled or sanded, care will be taken to ensure that airborne dust or fine dust accumulating in water used as a lubricant (if used) cannot adversely impact the surrounding terrestrial or aquatic habitat. The amount of dust anticipated through the proposed work is minimal, but controls should be in place as part of the owner/contractor's due diligence. Approved best management practices for instream works (Province of BC, 2004) provide details for the use of erosion and sediment control measures applicable, including the construction of diversions within the work area so that sediment-laden water does not directly enter the stream.

Provincial Feedback

The Province's Front Counter officers have preliminarily indicated no concerns regarding the boathouse's construction. Nevertheless, due diligence regarding work around the water body for rail system installation is being pursued.

Conclusion and Recommendations

Given the strategic placement of the retaining wall and boathouse in already disturbed areas, the minimal disruption associated with upgrading the water line and pump, and the non-intrusive approach towards the rail system's installation, the proposed construction is expected to have minimal environmental impact and the site conditions will post-development will be very similar to pre-development conditions. Proceeding with the Environmentally Sensitive Development Permit application to the RDCK is recommended.

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Appendix A – Riparian Area Assessment Report

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Submitted January 13, 2022 & November 22, 2022

DP 2115A & DP 2302A

Riparian Area Assessment Report

10377 Highway 3A, Gray Creek, BC

Jessica Lowey, MSc, PAg

1/13/2022

Executive Summary

The assessed property is located at 10377 Highway 3A in Gray Creek, BC, on the east shore of Kootenay Lake. This report has been prepared for the Regional District of Central Kootenay (RDCK) as a pre-condition of the issuance of a building permit. This report is included as part of a Development Permit, as required under section 920 of the Local Government Act, and will be filed on the title of the assessed property. The report has been prepared for and at the expense of the owner of the assessed property. The authoring Qualified Environmental Practitioner (QEP) has not acted for or as an agent of the RDCK.

The assessment followed the Simple Assessment methodology as described in the Riparian Areas Protection Regulation (BC Reg. 178/2019). The SPEA width for this Simple Assessment is 15 m, given the vegetation category, fish-bearing status and permanence of Kootenay Lake. Existing and proposed development falls within the SPEA and below the TOB at the assessed property; however, the potential for adverse effects as a result of the proposed development is low. To address the potential for adverse effects to occur through uncontrolled works, the current owner of the assessed property has committed to developing and implementing a Mitigation Plan that is intended to ensure that there is no net loss to aquatic habitat productivity. The Mitigation Plan will be developed to include the management and mitigation measures presented herein.

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Property Description

The assessed property is approximately 3 hectares (ha) and is located at 10377 Highway 3A, Gray Creek, BC, on the east shore of Kootenay Lake. The legal description for the assessed property is Lot 2 Plan NEP4523 District Lot 4595 Land District 26 (Kootenay). The Parcel Identification number (PID) is 010-421-874. The current owner of the assessed property is Bevan May who purchased the property in 2021.

Existing and Planned Development

A two-storey house on a concrete foundation currently exists on the upper portion of the assessed property, immediately west of Highway 3A. The house was constructed in 1963 and has likely experienced several renovations since that time. On the south side of the house is a small greenhouse and the septic field. On the north side of the house, a wooden staircase connects the upper portion of the assessed property to the lower portion where a boat house, rail system, deck and storage shed are located. A cliff approximately 30 meters (m) in height separates the upper and lower portions of the assessed property. Other existing infrastructure found in the lower portion of the assessed property includes a decommissioned hydro pole and scrap wiring, other decommissioned electrical equipment (e.g., light on the shoreline), and several water lines that run from the waters edge up the cliff to the house above (Figure 1).

Figure 1. Existing development of the assessed property.

The proposed development includes the installation of a funicular (a cable and rail system) intended to connect the upper and lower portions of the assessed property from a point on the western edge of the upper portion to a point above the high water mark in the lower portion (Figure 2), and a floating dock extending from gangway secured into the bedrock along the western shoreline, where a non-permanent deck area built of wood currently exists (Figure 3).

Figure 2. Top (left) and bottom (right) points of the proposed funicular.

Figure 3. Location of proposed floating dock and gangway.

The proposed development does not include the removal of trees or soil materials from the assessed property, nor does it potentially increase the overall risk of erosion and sedimentation at the site. The proposed installation of a funicular will require the removal or relocation of boulders at the base of the cliff, and the removal of a small area (approximately 5 square meters (m^2)) of shrubs (saskatoon (*Amelanchier alnifolia*)) and overburden (forest litter on top of bedrock) at the top of the cliff. The installation of the gangway will require no vegetation removal or earthworks, rather the securing of the gangway into the exposed bedrock along the western shoreline.

Riparian Area Assessment

1. Qualifications of the Assessor

Ms. Lowey is a registered Professional Agrologist in good standing with the British Columbia Institute of Agrologists (BCIA) in the practice areas of environmental impact assessment and mitigation planning; soil and land conservation, reclamation planning and management; and, vegetation identification, assessment and management. As of the date of this report, Ms. Lowey has conducted several Riparian Area Assessments following the methodology detailed below. She has successfully led projects into compliance with applicable Regulation, including others within the jurisdiction of the Regional District of Central Kootenay (RDCK). At KES, Ms. Lowey has access to a variety of technical experts, including other Professional Agrologists, Professional Foresters, and Professional Biologists.

2. Methodology

The assessment followed the Simple Assessment methodology as described in the Riparian Areas Protection Regulation (BC Reg. 178/2019). The Simple Assessment establishes Streamside Protection and Enhancement Area (SPEA) widths based on certain stream characteristics – fish-bearing status, nature of stream flows, and the status of streamside vegetation. These widths have been established for the

protection of fish habitat while taking into consideration existing development (i.e., permanent structures).

2.1. Determining Vegetation Category

The vegetation category is assessed within a 30 m wide area starting from the middle of the assessed property and going 200 m both upstream and downstream along the bank where the development will occur. Within the 30 m and 200 m assessment boundaries, the distance from the top of bank (TOB) to the first permanent structure was estimated at 40 m intervals (Figure 4). An air photo was used to undertake this measurement prior to inspecting the site in person. While on site, KES utilized a drone to improve the quality of the available aerial photos of the site for the purposes of this assessment.

2.2. Determining Fish Bearing Status

Fish bearing streams are ones in which fish are present or potentially present if introduced obstructions could be made passable. Using publicly available information on the waterbody, the fish bearing status of Kootenay Lake was confirmed. The following sources of information were consulted:

- iMapBC Fresh Water Atlas
- BC Habitat Wizard
- Kootenay Lake Shoreline Inventory Mapping

2.3. Determining Stream Permanence

Stream flow permanence is a factor only in determining a SPEA on non-fish-bearing streams. Kootenay Lake is a permanent water feature, that does not dry up.

Figure 4. Riparian area assessment boundaries.

2.4. Calculating SPEA Width

Using the three aforementioned characteristics, SPEA width is determined using Figure 5. The Riparian Areas Protection Regulation (BC Reg. 178/2019) defines the TOB for a floodplain area not contained within a ravine as the edge of the active floodplain of a stream where the slope of the land beyond the edge is flatter than 3:1 at any point for a minimum distance of 15 m measured perpendicularly from the edge. This definition of the TOB is suitable for the assessed property; however, the alternative definition for TOB applies for the areas 200 m up and downstream of the assessed property. In these areas, the TOB is defined as a break in the slope of the land such that the grade beyond the break is flatter than 3:1 at any point for a minimum distance of 15 m measured perpendicularly from the break.

Vegetation Category	***Existing or potential streamside vegetation conditions***	***Streamside Protection and Enhancement Area Width****		
		Fish bearing	***Non-Fish bearing***	
			Permanent	***Non Permanent***
1	Continuous areas ≥30 m or discontinuous but occasionally > 30 m to 50 m	30 m		Minimum 15 m Maximum 30m Refer to Figure 2-2
2	Narrow but continuous areas = 15 m or discontinuous but occasionally > 15 m to 30 m	Minimum 15 Maximum 30 Refer to Figure 2-2	15 m	
3	Very narrow but continuous areas up to 5 m or discontinuous but occasionally > 5 m to 15 m	15 m	Minimum 5m Maximum 15 m Refer to Figure 2-3	

Figure 5. Determining SPEA widths for the Simple Assessment.

3. Fisheries Resource Values

Kootenay Lake is a fish bearing waterbody that is managed for angler use. Kootenay Lake supports many different fish species, both native and invasive. Species present include longnose dace, torrent sculpin, rainbow trout, kokanee, slimy sculpin, brook trout, mountain whitefish, redside shiner, peamouth chub, northern pikeminnow, bull trout, white sturgeon, pygmy whitefish, yellow perch, burbot, westslope cutthroat trout, longnose sucker, leopard dace, largescale sucker, prickly sculpin, bridgelip sucker, lake whitefish, dolly varden, carp, pumpkinseed, and largemouth bass. Known key fish habitat present in Kootenay Lake includes spawning, rearing, living and foraging, and migration corridors.

The shoreline at the assessed property is rocky. There was no woody debris observed along the shoreline below the HWM. This observation is consistent with adjacent properties. Above the HWM extensive amounts of woody debris were observed, naturally accumulating in pools/bays along the shoreline both up and downstream of the assessed property. There were no turbulent water features (e.g., riffles, cascades), undercut banks or in-stream vegetation overserved along the shoreline of the assessed property or adjacent properties. The Kootenay Lake Shoreline Guidance Document (Kootenay Lake Partnership, 2020) assessed the same segment of shoreline as having no evidence or low potential for aquatic habitat for the species listed in Table 1, with the exception of juvenile rearing habitat. Bird habitat potential was also observed. The field assessment did not yield any evidence of nests, although tree nesting habitat exists up and downstream of the assessed property. No evidence of raptors was

observed through the field assessment, although raptor breeding occurrence in the Kootenay/Boundary region does not typically commence until April (Ministry of Forests, Lands, Natural Resource Operations and Rural Development, 2013).

Table 1. Kootenay Lake shoreline habitat assessment summary (Kootenay Lake Partnership, 2021).

Habitat Assessed	Habitat Potential	Habitat Assessed	Habitat Potential
White sturgeon spawning	No	Red- or Blue-listed species	Yes
Bats	No	Fish staging	No
Raptors	Yes	Fish migration	No
Heron	No	Salmon spawning	No
Nests	Yes	Juvenile rearing	Moderate
Amphibians	No	Kokanee spawning	No

The riparian area vegetation of the assessed property and adjacent properties is predominantly dry conifer forest (ponderosa pine (*Pinus ponderosa*) and Douglas fir (*Pseudotsuga menziesii*)) which sometimes extends to the HWM but does not overhang the waterbody. Much of the vegetation is contained to the TOB as the exposed bedrock cliffs between the TOB and the HWM are steep and free of soil materials, with the exception of the assessed property. Very little of the riparian area vegetation on the assessed property and neighbouring properties has been modified through clearing activities or other anthropogenic factors. Other species observed include saskatoon, Oregon grape (*Mahonia aquifolium*), common juniper (*Juniperus communis*), Wood's rose (*Rosa woodsii*), yarrow (*Achillea millefolium*), round-leaved alumroot (*Heuchera cylindrica*), and falsebox (*Pachistima myrsinites*). Two invasive plant species were observed on and adjacent the assessed property, including spotted knapweed (*Centaurea stoebe*) and scotch broom (*Cytisus scoparius*).

4. Determination of SPEA Width

The vegetation category was determined to be 3 (Figure 5), based on the details provided in Table 2. This assessment was difficult given the irregular shape of the shoreline and the steep slopes up and downstream of the assessed property. Within the assessed property, the TOB lies outside the 30 m area used for determining the vegetation category in two instances (segments 5 and 6). This is attributed to the irregular shape of the shoreline in those segments (Figure 7). In the areas up and downstream of the assessed property, the shoreline rises steeply away from the HWM, unlike at the assessed property (Figure 6). This resulted in the TOB moving eastward towards the highway (the TOB is located alongside the highway, where the slope breaks). Using the determined vegetation category, fish-bearing status of Kootenay Lake and its permanence, KES has determined that the SPEA width for the assessed property is 15 m (Figure 5; Figure 7).

Table 2. Site-specific determination of SPEA width (assessed property segments highlighted).

Segment Assessed	Distance to First Permanent Structure
1	5 m
2	4 m

Segment Assessed	Distance to First Permanent Structure
3	3.5 m
4	20 m
5	6.5 m
6	6 m
7	12 m
8	15 m
9	4.5 m
10	5.5 m
11	5 m
Average	**8 m**

Figure 6. Upstream (left) and downstream (right) shorelines outside the assessed property.

Figure 7. SPEA determination for the assessed property.

Discussion of Existing and Potential Impacts

Existing disturbances were observed to be stable. No evidence of erosion or sedimentation was observed to be associated with the existing disturbances within 30 m of the high water mark, including within the SPEA. Soils of the upper portion of the assessed property are shallow and well vegetated with either grass, ornamental plants or native trees and shrubs. Limited soil resources (e.g., predominantly sand) and considerable amounts of exposed bedrock exist throughout the lower portion of the assessed property. Where soil or vegetation exists in the lower portion, they were observed to be stable. Two invasive plant species (spotted knapweed and scotch broom) were observed in the lower portion of the assessed property, likely a result of encroachment from the roadside, as well as within 200 m up and downstream of the assessed property.

Disturbances within 30 m of the high-water mark include:

- Lower portion of the assessed property:
    - Deck
    - Rail system
    - Boathouse
    - Storage shed
    - Fire pit
    - Water lines
    - Decommissioned electrical supply
    - Staircase
- Upper portion of the assessed property:
    - Staircases
    - House
    - Garage / Carport
    - Driveway
    - Greenhouse
    - Septic field

Vegetation within the riparian area includes:

- Ponderosa pine (*Pinus ponderosa*)
- Douglas fir (*Pseudotsuga menziesii*)
- Oregon grape (*Mahonia aquifolium*)
- Common juniper (*Juniperus communis*)
- Wood's rose (*Rosa woodsii*)
- Yarrow (*Achillea millefolium*)
- Round-leaved alumroot (*Heuchera cylindrica*)
- Falsebox (*Pachistima myrsinites*)
- Spotted knapweed (*Centaurea stoebe*; invasive)
- Scotch broom (*Cytisus scoparius*; invasive)

All of the proposed development (funicular, dock and gangway) is located within 15 m of the high water mark, or the Environmentally Sensitive Development Permit (ESDP) Area, as defined by the RDCK Land Use Bylaw (No. 2315, 2015). The upper portion of the assessed property is estimated at 30 m elevation (vertical distance) above the high water mark and greater than 15 m from the HWM (horizontal

distance). Thus, the potential impacts of the proposed development work in this portion of the assessed property are not expected to cause adverse effects to terrestrial or aquatic habitats, or drinking water quality. The proposed funicular installation requires minor amounts of forest floor materials to be removed from the top of the cliff where two rods/pilings will be bored into bedrock. The forest floor materials in this location were observed to be very shallow, predominantly consisting of pine needle litter, and directly on top of exposed bedrock. The clearing in this area will also require that one cluster of saskatoon shrubs are removed. Neither of these tasks require the removal of mature trees from the assessed property. All proposed work in the upper portion of the assessed property is greater than 15 m from the high water mark; thus, falling outside the ESDP Area.

The base of the funicular, as well as the proposed dock and gangway, occur within 15 m of the highwater mark in the lower portion of the assessed property. The construction of the base of the funicular requires that three large pieces of dislodged bedrock are moved or crushed into smaller pieces. The base of the funicular will be secured directly into bedrock at the base of the cliff (Figure 2). The base of the funicular is situated immediately above the high water mark. The dock and associated gangway, located along the western shoreline of the assessed property, will also require direct securement into the exposed bedrock in this location (Figure 3). The top of the gangway will be secured in place above the high water mark. The dock will be a floating structure secured to the end of the gangway. No disturbance of soil or vegetation is required for the proposed work in the lower portion of the assessed property, within the ESDP Area.

Proposed Management and Mitigation Measures

The following proposed management and mitigation measures are intended to ensure no adverse effects to the terrestrial or aquatic habitat, or drinking water quality, through the work. These management and mitigation measures will be implemented throughout the proposed work by the property owner with assistance from a QEP.

- ### Communication Plan

All site personnel will be informed of their obligation to protect the terrestrial, aquatic and drinking water values at the assessed property through the proposed work. This includes limiting disturbance footprints within the SPEA, and operating from above the TOB whenever practicable. For the proposed dock work, a barge will be used and work conducted from the water. Spill response, if required, will follow provincial guidelines.

- ### Equipment

Cleaning procedures will be implemented for all incoming equipment, including footwear, to avoid the introduction of both terrestrial and marine invasive plant species. Equipment will not be permitted to perform work on the assessed property if it is not free from mud, debris, vegetation, etc.

- ### Vegetation Removal

Vegetation removal will be minimal and only as required for the installation of the top of the funicular. This is expected to include the removal of one group of saskatoon shrubs from the western edge of the cliff in the upper portion of the assessed property. No mature trees are scheduled to be removed. Along with the vegetation removal, the area will be stripped of all forest litter that lies on top of exposed bedrock. This removal of material will occur in a controlled manner and will not be pushed down the cliff

to the lower portion of the assessed property. All removed materials will be stockpiled on the upper portion of the assessed property, away from the cliff edge, until otherwise disposed of or managed per the approved best management practices for instream works (Province of BC, 2004).

- **Invasive Plant Control**

Two invasive plant species were observed on the assessed property and are presumed to have originated from populations along the side of the highway (Figure 8). These species were also observed 200 m up and downstream of the assessed property. Spotted knapweed (*Centaurea stoebe*) should be manually removed and chemically controlled, with extra care taken in its application given the proximity to the high water mark. Existing spotted knapweed skeletons should be carefully removed in such a manner that reduces the likelihood of spreading seeds in the process. Scotch broom (*Cytisus scoparius*) should also be removed through manual and chemical means. Plants should be dug or pulled, taking care to remove as much of the root as possible. Scotch broom may also be controlled via chemical means in the spring.

Figure 8. Invasive plant species found within the assessed property boundaries.

- **Dust Control**

Where concrete or bedrock is cut, drilled or sanded, care will be taken to ensure that airborne dust or fine dust accumulating in water used as a lubricant (if used) is not allowed to adversely impact the surrounding terrestrial or aquatic habitat. The amount of dust anticipated through the proposed work is minimal, but controls should be in place as part of the owner/contractor's due diligence. Approved best management practices for instream works (Province of BC, 2004) provide details for the use of erosion and sediment control measures that would be applicable for this work, including the construction of diversions within the work area so that sediment-laden water does not directly enter the stream.

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Appendix B – Riparian Area Management Plan

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Submitted January 24, 2022 & November 22, 2022

DP 2115A & DP 2302A

Riparian Area Management Plan

10377 Highway 3A, Gray Creek, BC

Jessica Lowey, MSc, PAg

1/24/2022

Proposed Management and Mitigation Measures

The following proposed management and mitigation measures are intended to ensure no adverse effects to the terrestrial or aquatic habitat, or drinking water quality, through the work.

- **Communication Plan**

All site personnel will be informed of their obligation to protect the terrestrial, aquatic and drinking water values at the assessed property through the proposed work by the authoring Qualified Environmental Professional (QEP). This includes limiting disturbance footprints within the Streamside Protection Enhancement Area (SPEA), and operating from above the Top of Bank (TOB) whenever practicable, or alternatively, from a barge with work being conducted from the water, as needed. Spill response, if required, will follow provincial guidelines and will be the responsibility of the equipment operator.

The authoring QEP will be on site for the start of the proposed work to communicate requirements and expectations, and to observe the work procedures. The QEP will direct, observe and record details of the work that occurs while on site, including details of a pre-construction kickoff meeting (when, where, who, topics discussed, questions asked, etc.), equipment inspection, any changes to the work plan, mitigation measures implemented, the effectiveness of those mitigation measures, and the amount of work completed while on site. Any work that occurs without direct supervision of the QEP will be documented by the property owner and submitted to the QEP for inclusion in the Project Completion Report.

- **General Measures to Protect Fish and Riparian Areas**
  - No application of herbicides within 2 meters (m) of the high water mark.
  - Herbicide use will target only invasive vegetation.
  - Herbicide use will not remove native vegetation or be used to brush an area.
  - Trees will be felled directionally away from the shoreline to minimize disturbance to the riparian area.
  - No deleterious substances are allowed to enter the waterbody, including fuels and lubricants, debris, dust, herbicide products, or sediment.
  - Equipment or vehicles will not be washed along the shore of any body of water.
  - No equipment will be serviced or refueled any less than 30 m from a body of water.
  - Watercourses will not be diverted, blocked, or restricted, except temporarily to correct hazardous situations, or in an emergency.

- **Equipment**

Cleaning procedures will be implemented for all incoming equipment, including footwear, to avoid the introduction of both terrestrial and marine invasive plant species. Equipment will not be permitted to perform work on the assessed property if it is not free from mud, debris, vegetation, etc. The QEP on site will inspect all equipment and record findings.

- **Vegetation Removal**

Vegetation removal will be minimal and only as required for the installation of the top of the funicular. This is expected to include the removal of one group of saskatoon (*Amelanchier alnifolia*) shrubs from the western edge of the cliff in the upper portion of the assessed property. No mature trees are scheduled to be removed. Along with the vegetation removal, a small area will be stripped of all forest litter that lies on top of exposed bedrock, prior to drilling and placing steel rods to support the top of the

funicular. This removal of material will occur in a controlled manner and will not be pushed down the cliff to the lower portion of the assessed property. All removed materials will be stockpiled on the upper portion of the assessed property, away from the cliff edge, until otherwise disposed of or managed per the approved best management practices for instream works (Province of BC, 2004).

The proposed vegetation removal at the assessed property is minor and does not warrant any restoration activities. Details pertaining to the vegetation removal work will be discussed with the property owner and contractor(s) while the QEP is on site to ensure best management practices are followed, and the removal occurs in an environmentally safe manner.

- **Invasive Plant Control**

Two invasive plant species were observed on the assessed property and are presumed to have originated from populations along the side of the highway (Figure 1). These species were also observed 200 m upstream and downstream of the assessed property.

o Spotted Knapweed

Spotted knapweed (*Centaurea stoebe*) will be manually removed by the property owner. The QEP will review species identification with the property owner and will provide reference guides for future control needs. The QEP will discuss the possibility of chemically controlling the species, with extra care taken in its application given the proximity to the high water mark, as needed to initially control the species' establishment. Existing spotted knapweed skeletons will be carefully removed in such a manner that reduces the likelihood of spreading seeds in the process, and removes as much plant material (including roots) as possible with minimal soil disturbance.

Mechanical control notes:

- Pulling, cutting or mowing is most effective when completed prior to seed set. If the plants have not yet flowered, the removed plants can be left onsite, but stems should be twisted, bent or otherwise crimped.
- If manual removal occurs while flowers are present on stems, the plants must be bagged and removed from the site to prevent production of viable seeds.
- Whenever/wherever possible, the root system should be removed to prevent re-sprouting; however, stem removal and prevention of seed set is most important.
- Follow-up treatments will be required as knapweed has an extensive, long-lived seed bank.

Chemical control notes:

- Herbicides are effective against knapweed, including "Round Up".
- Careful attention must be paid to minimize non-target damage (i.e., implementing selective application).
- There will be no application of herbicides within 2 m of the high water mark.
- Herbicide use should only be considered if population numbers are overwhelmingly high for manual removal methods.

o Scotch Broom

Scotch broom (*Cytisus scoparius*) will also be removed, primarily, through manual means. The QEP will review species identification with the property owner and will provide reference guides for future

control needs. The QEP will discuss the possibility of chemically controlling the species, as with spotted knapweed. Plants should be dug or pulled, taking care to remove as much of the root as possible.

Mechanical control notes:

- Minimizing soil disturbance, cut larger plants below ground level before flowering and seed set. Plants with stems less than 1.5 m in diameter may be hand pulled, preferably in late spring when the plant is directing its energy into flower and seed production.
- Mechanical control is most effective if all of the plant is removed, no seeds are dropped and soil disturbance is minimized.
- Hand pulling may encourage growth due to the high level of soil disturbance. If this is the case, plants can be cut as close to the ground as possible.
- Due to enormous seed banking and re-sprouting potential (stumps and roots), mechanical treatments may need to be implemented over many years.

Chemical control notes:

- Herbicides are effective against knapweed, including “Round Up”.
- Careful attention must be paid to minimize non-target damage (i.e., implementing selective application), including the use of cut surface application.
- There will be no application of herbicides within 2 m of the high water mark.
- Herbicide use should only be considered if population numbers are overwhelmingly high for manual removal methods.

Figure 1. Invasive plant species found within the assessed property boundaries (spotted knapweed (left), scotch broom (right)).

- ### Dust Control

Where concrete or bedrock is cut, drilled or sanded, care will be taken to ensure that airborne dust or fine dust accumulating in water used as a lubricant (if used) is not allowed to adversely impact the surrounding terrestrial or aquatic habitat. The amount of dust anticipated through the proposed work is minimal, but controls (such as using water) should be in place as part of the owner/contractor's due diligence. Approved best management practices for instream works (Province of BC, 2004) provide details for the use of erosion and sediment control measures that would be applicable for this work, including the construction of diversions within the work area so that sediment-laden water does not directly enter the stream. The QEP will review, discuss, observe and record the implementation and effectiveness of erosion and sediment control measures on site.

The proposed work is scheduled to occur between the TOB (start of the SPEA) and high water mark at the assessed property. Given the topography of the assessed property, this area will be used to filter sediment-laden water used for dust control, despite best management practices in Riparian Areas Protection Regulation Technical Assessment Manual (2019). Careful consideration will be used when planning the location of sediment control measures to minimize the potential for adverse impacts to the adjacent waterbody or any exposed lakebed sediments.

- #### General Sediment Control Best Management Practices

  - Conduct work during periods of low flow, and during least-risk timing windows for relevant fish species.
  - Put sediment control measures in place before starting any works that may result in sediment mobilization.
  - Minimize the amount of soil disturbance.
  - Construct ditches, water bars, or water diversions within the work areas so they do not directly discharge sediment-laden surface water flows into a waterbody.
  - Utilize sediment traps and silt fencing.

- ### Project Completion Report

The QEP will draft a Project Completion Report following the completion of all permitted works at the site. The QEP is only anticipated to be on site for the first day of construction with any additional work documented by the property owner. Daily updates will be provided to the QEP for work that is conducted without direct oversight, and all documentation will be shared with the QEP for inclusion in the final report. The RDCK may require the QEP to conduct a post-construction site visit.

References

Province of BC. (2004). Standards and Best Practices for Instream Works. Retrieved from https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/best-management-practices/iswstdsbpsmarch2004.pdf

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Appendix C – Remediation Plan

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Submitted November 22, 2022

DP 2302A

Remediation Plan

10377 Highway 3A, Gray Creek, BC

Michael Keefer, MSc, PAg; Baylie Sjodin, MEP, EPt; Brenley Yuan, MSc, RPBio

November 21, 2022

Background

In March 2021, Keefer Ecological Services Ltd. (KES) conducted a riparian area assessment (RAA) at 10377 Highway 3A in Sanca, B.C. (Appendix B). The Qualified Environmental Professional (QEP), Jessica

Lowey, MSc, PAg, used the Riparian Areas Protection Regulation (RAPP) simple assessment method to calculate a Stream Protection and Enhancement Area (SPEA) of 15 m from the natural lake boundary (i.e., high-water mark).

The RAA's primary purpose was to propose management and mitigation measures for constructing a funicular, dock, and gangway for an Environmentally Sensitive Develop Permit (ESDP) through the Regional District of Central Kootenay (RDCK) Land Use Bylaw (No. 2315, 2015). All activities were proposed to occur within the SPEA and below the natural lake boundary. Upon receiving the ESDP, the QEP supplied the property owner with an updated Riparian Area Management Plan for construction activities (Appendix C). In March 2022, a QEP monitored construction activities per the Riparian Area Management Plan and found activities to comply with the plan. This remediation plan is in response to works that exceeded the scope outlined in the Riparian Area Management Plan, which occurred outside QEP monitoring.

In June 2022, the Ministry of Forests (MoF), the Department of Fisheries and Oceans Canada (DFO), and the Ktunaxa Nation Council (KNC) raised concerns about the activities that occurred at the site. Concerns from the above governing bodies included:

- The location of a fuel tank near the lakeshore,
- Excessive altering of fish habitat and the riparian zone, and
- The creation of a rock berm with the potential to trap fish.

Michael Keefer, a Professional Agrologist (PAg), has acted as the QEP for developing the remediation plan for this property. Michael is in good standing with the British Columbia Institute of Agrologists (BCIA) in the practice of ecological restoration. Michael is supported by Brenley Yuan, a Registered Professional Biologist (RPBio) with a background in fish habitat restoration. In the professional opinion of the QEPs, if the remediation outlined below is implemented as proposed by this plan, there will be no foreseeable harmful alteration, disruption or destruction of natural features, functions, and conditions that support fish life processes in the riparian assessment area.

Timeline of Activities

Construction began on March 4, 2022, and continued until April 30, 2022. Planned activities during this time included removing the existing boathouse, marine railway, and several large boulders for the foundation of the funicular, the safe operation of machinery, and future boat access. KES monitored one day of construction on March 14, 2022, to ensure compliance with the management and mitigation plans. All other activities have been self-reported by the property owner. Future construction will include the installation of the funicular in spring 2023.

Table 1. A daily log of construction activities on site

Date	Actions
March 4, 2022	● Excavator unloaded on-site (Appendix A: Figure 1)

	● Fuel tank secured near shore ● Note to move large boulders coming up the shore for the machine to pass before the fuel tank can be relocated away from the water
March 5, 2022	● Begin breaking large boulders up the shoreline ● Sufficient to allow machinery to pass

March 11, 2022	● Breaking and removal of the boulder at the apex of the peninsula
	  ● Boulder was precluding clearing stone from away from boathouse base)
	  ● Clearing revealed that the boathouse foundation was poor, and dismantling was required
	  ● Further removing boulders on the south side of the boathouse required
	● Set up dust control water pump

March 13, 2022	● Cleared machine pathway of rubble (Appendix A: Figure 2 & Figure 3)
	  ● Through the south channel and up to the boathouse
	  ● The path was widened for the passage of the machine, so the material removed could be placed higher

March 14, 2022	● KES QEP and a KES staff member arrive on site (Jessica Lowey & Danielle Smart)
	  ● QEP observes work to date
	● QEP observes the hammering of large boulders and the funicular base area with and without a water system
	  ● QEP recommends using a water system for dust control
	● QEP reviewed invasive species present on-site and a management plan
	● QEP departs
	● Continue to remove boulders from around the south side of the boathouse
	● Material from around the boathouse was distributed along the south channel
	● Clearing around the north channel to facilitate proper further cleanup and removal of prominent large boulders (Appendix A: Figure 4)
	● Job is 80% complete

March 15, 2022	● Remaining residual hammering pile on the west side of the north channel ● Job is 98% complete
March 16 – 27, 2022	● Minor cleanup and smoothing (Appendix A: Figure 5, Figure 6, & Figure 7)
March 30, 2022	● Dismantled boathouse (Appendix A: Figure 8)
April 24, 2022	● Continued rock removal from near water edge to ensure safe boating operations (Appendix A: Figure 9)
April 25 – 30, 2022	● Removal of stones impacting marine railway

Regulatory Notice

On June 21, 2022, an email from the Ministry of Forests was sent to the property owner with an immediate Stop Work Order. Construction activities have halted until remediation requirements have been met. The email highlighted the following concerns with the Provincial permit approval:

- The location of the fuel tank within the restricted 30 m of the lakeshore (per Clause N)
- The removal of excess boulders from below the high-water mark to above the high-water mark (per Clause G)
- The approval and registration of an accretion survey (per Clause D)

Current Conditions

On June 20, 2022, the property owner contacted the QEP via email. In the email, the proposed construction activities were cited to be complete for 2022. It was noted that more materials had been moved on the foreshore than initially estimated. The property owner requested that the QEP visit the site for an evaluation of works completed and any recommendations before the scheduled departure of the machinery in September 2022. Correspondence regarding the concerns mentioned above was also shared with the QEP.

On June 30, 2022, QEP Michael Keefer and Baylie Sjodin visited the site with the property owner. The water level on Kootenay Lake was 533.10 m, slightly less than the peak level of 533.89 m on June 15, 2022 (FortisBC, n.d.).

Terrestrial

o Machine Path

Terrestrial conditions were assessed as those above the natural lake boundary (i.e., high-water mark). A path approximately 10 m wide was observed from north to south connecting the two channels on-site (Appendix A: Figure 10). The path was predominantly sand with minimal coarse rock fragments and no coarse woody debris above the natural lake boundary (Appendix A: Figure 11). No vegetation was seen growing in the sandy area.

o Tree Removal

The property owner reported removing three ponderosa pine (*Pinus ponderosa*) and three Douglas fir (*Pseudotsuga menziesii*) trees on-site due to damage from a storm during the 2021-2022 winter. The QEP confirmed the location along the north channel's eastern shore (Appendix A: Figure 12). No other vegetation was observed to be removed along the shoreline during construction.

o Rock Bern

A rock berm approximately 1-2 m tall, 25 m long, and 5-10 m wide was observed along the eastern shore of the north channel (Appendix A: Figure 13). The berm was built of rock material removed during construction ranging from 10-100 cm in diameter at an approximate 75% (or 36°) slope. The berm covered a stretch of natural vegetation approximately 1 m wide along the shoreline. One young paper birch (*Betula papyrifera*) appeared unharmed by the surrounding rock fragments (Appendix A: Figure 14). No vegetation appeared to be growing on the berm at the time of the site visit, other than the birch sapling.

o Boathouse

Rocks along the west and south perimeter of the dismantled boathouse were removed and appear to be added to the rock berm. Rock fragments along the dismantled boathouse's east perimeter appeared undisturbed (Appendix A: Figure 15).

o Invasive Species

Spotted knapweed (*Centaurea stoebe*) and downy brome (*Bromus tectorum*) were observed on-site along the footpath leading from the house to the site, beginning approximately 10 m north-east of the dismantled boathouse (Appendix A: Figure 16).

Aquatic

o Foreshore

The foreshore was assessed as the area between the high- and low-water mark, starting at the natural lake boundary for approximately 25 m north. All rock fragments under 15 cm in diameter appeared to be removed along the northern channel's foreshore (Appendix A: Figure 9). Some coarse woody debris was observed to have been deposited with the receding lake level.

The rock berm was observed to cover a 1-5 m wide foreshore section along the north channel's eastern edge. Rock fragments in the foreshore varied from 10-100 cm in diameter. The northern portion of the rock berm gradually slopes downward to meet the natural ground of the foreshore. During high water levels, there is a potential for water to pool behind the rock berm and trap fish. Woody debris was observed to have collected behind the rock berm during the peak high-water levels in early June, providing evidence for the potential for fish entrapment (Appendix A: Figure 17). No vegetation appeared to be growing on the berm foreshore at the time of the site visit.

o Fish Habitat

All rock fragments under 15 cm in diameter appear to be removed in the northern channel spanning an approximate distance of 10 m wide and 25 m long north of the natural lake boundary (Appendix A: Figure 9). As determined in the RAA report, previous site conditions held the potential for juvenile fish rearing habitat (Appendix B). Consequently, the removal of all rock fragments may impact fish rearing habitat on-site by:

- reducing habitat complexity,
- reducing benthic macroinvertebrate foraging opportunities,
- destabilizing foreshore sediments,
- burying food organisms,
- and altering normal shoreline currents, deposition patterns, plankton, and fish movements (Fisheries and Oceans Canada, 2002; Randall et al., 2011; Schleppe & Arsenault, 2006).

Furthermore, adding a hard, steepened shoreline by the rock berm further reduces habitat complexity and alters energy dissipation dynamics, possibly leading to instability (Kahler et al., 2000; Schleppe & Arsenault, 2006).

No vegetation appeared to be growing on the foreshore. Minimal coarse woody debris has collected along the foreshore and at the lake's edge (Appendix A: Figure 11).

Remediation

The overall goals of the remediation plan for the assessed property are modification of the topography to support the establishment of native species and the restoration of juvenile fish rearing habitat. It is recommended that the property owner remediate the impacts of construction activities above and below the natural lake boundary. Detailed actions are described below and include plans to:

- Reduce the height and slope of the rock berm while creating suitable microsites for the installation of native plants,
- Eliminate the potential for fish entrapment potential behind the rock berm,
- Plant vegetation on and around the levelled rock berm, and

- Redistribute larger rock fragments below the natural lake boundary for fish habitat.

Rock Berm

The rock berm should be reprofiled to the natural, pre-construction foreshore geometries (reduced height and more gradual slope), using past photos and the surrounding shoreline as a guide. Larger rocks (>40 cm) should be returned to the foreshore for fish habitat to mimic pre-construction site conditions, while smaller rocks can be stored above the high-water mark by creating a talus-like habitat area for revegetation. Special care should be taken to eliminate existing fish stranding opportunities and prevent new ones from being created. Specifically, the northern end of the berm should be levelled with the eastern shoreline to eliminate the potential for fish entrapment during high water in the spring.

During construction, a path should be created at the southern end of the berm by pulling rock fragments from the top portion down to allow access for the machine to ascend the rock berm (Appendix A: Figure 18). Once stably on top, the machine should safely deconstruct the pile by moving rocks to the eastern side of the berm and stockpiling rocks to be returned to the foreshore. When placing rocks around the birch tree, care must be taken to ensure its continued survival (Appendix A: Figure 14). If the removal of the birch is necessary for safe rock removal, then birch plugs must be planted in replacement (see the Vegetation section below).

Fish Habitat

The area below the natural lake boundary should be restored to its natural state as much as possible (according to a QEP) while maintaining reasonable navigability. This would result in select areas of the altered foreshore being returned to cobble substrate, occasionally interspersed with larger boulders (diameters 30 cm or greater) at a minimum frequency of one boulder per 0.5 m^2 where possible. The total remediation area, substrate composition and frequency of large boulders should mimic pre-construction conditions (while maintaining navigability), using past photos and surrounding shorelines as a guide. Before remediation construction begins, we recommend a QEP conduct a site assessment to evaluate whether cobble substrate management will be required beyond the natural accumulation that has occurred since construction activities ceased. Above the high-water mark, a channel no greater than 3 m wide can remain clear of rock fragments.

Given the previous conditions of the foreshore and the need to maintain a navigable channel, placing coarse woody debris that can be dislodged in high waters is not recommended.

Vegetation

To facilitate the restoration process, the following revegetation plan is recommended. It should be noted that the site will be deliberately over-planted to account for the expected mortality of juvenile plants. After re-grading the rock berm, topsoil should be placed in locations (determined by the QEP) between and under the rock fragments. Kinnikinnick (*Arctostaphylos uva-ursi*) plugs should be planted at one plug per square meter. The character of the rock berm will be modified through the removal of larger rock pieces (>40 cm), an activity that will reduce the height of the berm and make it more stable in the long term, as well as make it suitable for planting.

Atop the rock berm, twelve trees (six ponderosa pine and six Douglas fir) should be planted at a 2 m spacing to replace the trees removed during construction. If the birch sapling is harmed during the

recontouring of the rock berm, then two birch trees should be planted in replacement to maintain adequate microsites. The total number of trees is inflated to account for a 50% survival rate following planting. The juvenile trees should be planted as container stock in the spring of 2023. In addition, any added topsoil should be covered with mulch to prevent erosion and maintain sufficient soil moisture.

Invasive species plant management should continue per the Riparian Area Management Plan in January 2022 (Appendix C).

Monitoring

We recommend that a QEP visit the site pre-construction, during, and post-construction. It is recommended to have a QEP on-site at least once during the rock berm works to direct the selection and placement of rock for fish habitat on the foreshore. If construction is expected to take longer than five days, a second site visit is recommended to ensure remediation activities are still on track before completion.

Post-completion monitoring of the site is recommended for two growing seasons following revegetation. It should consist of one site assessment by a QEP each spring/summer.

Monitoring for invasive species will also take place. The absence of Scotch broom and spotted knapweed is a priority as they can negatively affect the establishment of the targeted native plant species. Species identification support and removal processes have been provided to the property owner via the Riparian Area Management Plan in January 2022 (Appendix C).

Offsetting

To help ensure that riparian and fish habitat productivity lost at the property is restored to an equivalent or higher level, a donation of $1,170.00 should be made to the Nature Conservancy of Canada (NCC), or an equivalent organization, to aid in Kootenay Lake riparian habitat restoration efforts. The cost was calculated based on information provided by NCC, indicating that restoration of high-quality riparian habitat costs about $5.85 per m^2.

Costs

Below is a summary of estimated costs associated with the remediation plan, including costs for post-construction monitoring in years two and three.

Activity	Estimated timeline	Estimated cost	
Earthworks	Spring 2023	$	6,200.00
Construction monitoring by a QEP	Spring 2023	$	8,700.00
Container plant stock & topsoil	Spring 2023	$	600.00
Offsetting donation	Winter 2022	$	1,170.00

Annual Inspection for years 1-3 by a QEP	Summer 2023 - 2025	$	3,600.00
TOTAL		$	20,270.00

Note: Costs are an estimate based on foreseeable work. Actual costs may differ pending on timelines, supplies, or altered work plans.

References

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Appendix A: Site Photos

Figure 1. Excavator and fuel tank are unloaded on the north shore from a barge.

Image was taken on March 11, 2022

Figure 2. Overhead view of the south channel after the path was widened and cleared of debris.

Image was taken on March 13, 2022

Figure 3. Overhead view of the north channel after the path was widened and cleared of debris.

Image was taken on March 13, 2022

Figure 4. Cleaning the north channel to remove large boulders.

Image was taken on March 14, 2022

Figure 5. Northern shoreline facing west following boulder and rock removal.

Image was taken on March 18, 2022

Figure 6. Northern shoreline facing east following boulder and rock removal.

Image was taken on March 19, 2022

Figure 7. Overhead view of the south channel following boulder and rock removal.

Image was taken on March 27, 2022

Figure 8. Overhead view showing the location of the dismantled boathouse.

Image was taken on April 1, 2022

Figure 9. Overhead view of the north channel showing foreshore cleared of boulders and debris.

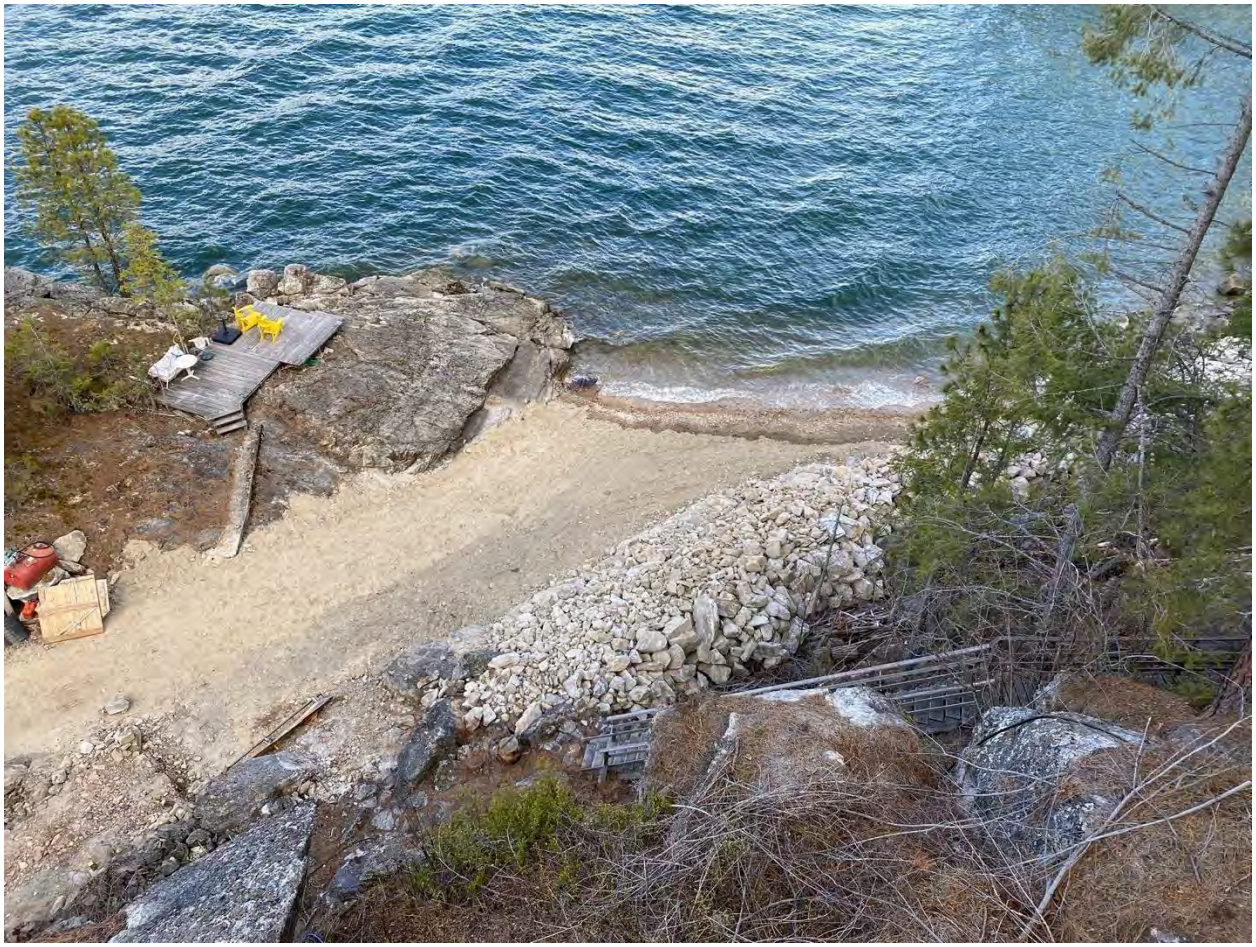

Image was taken on April 9, 2022

Figure 10. Overhead view of the site following construction activities.

Imagine was taken on June 30, 2022, by KES

Figure 11. The north channel facing west with sand above the natural lake boundary and coarse fragments on the foreshore.

Image was taken on June 30, 2022, by KES

Figure 12. The eastern shoreline of the north channel where trees were removed.

Image was taken on June 30, 2022, by KES

Figure 13. Rock berm along the eastern shore of the north channel.

Image was taken on June 30, 2022, by KES

Figure 14. A young paper birch tree unharmed by the rock berm.

Image was taken on June 30, 2022, by KES

Figure 15. Rock fragments along the eastern perimeter of the dismantled boathouse.

Image was taken on June 30, 2022, by KES

Figure 16. Spotted knapweed manually removed by KES during the June 30 site visit.

Image was taken on June 30, 2022, by KES

Figure 17. The northern end of the rock berm displaying a collection of woody debris deposited behind during high-water levels.

Image was taken on June 30, 2022, by KES

Figure 18. Location of the recommended construction of a machine access slope.

Image was taken on June 30, 2022, by KES

Appendix D – Environmental Monitoring Report

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Submitted July 10, 2023

DP 2302A

Environmental Monitoring Report

10377 Highway 3A, Gray Creek, BC

Michael Keefer, PAg; James Baxter, RPBio;
Baylie Sjodin, EPt; Mikayla Davis, BIT

July 10, 2023

Overview

Keefer Ecological Services (KES) observed construction activities at 10377 Highway 3A, Sanca, BC between March and June 2023. Construction activities were being conducted following recommendations in the Remediation Plan submitted on November 22, 2022. The Remediation Plan was presented and reviewed by the following:

- Nelson Wight, Planning Manager and Sadie Chezenko, Planner – Regional District of Central Kootenay (RDCK)
- Calvin Beebe, Assistant Water Manager – Ministry of Forests, Kootenay Boundary Region (MoF)
- Kenton Andreashuk, Senior Fishery Guardian – Ktunaxa Nation Council (KNC)

As per email communications on March 5, 2023, approvals for work below the natural lake boundary (i.e., high water level) were given by MoF, while work above the natural lake boundary was awaiting approval from the RDCK. Consequently, all work conducted on March 16th and March 25th was below the natural lake boundary. Works above the natural lake boundary took place on June 14, 2023 following the issuance of a Development Permit (DP2302A) through the RDCK on May 26, 2023. A Kubota KX080-4 mini-excavator performed all machine work, while planting was done by hand.

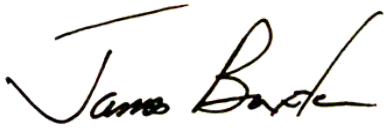
Objectives

The signing qualified professionals concur that following objectives outlined in the November 22, 2022 Remediation Plan were met by the activities outlined in this report:

- Reduce the height and slope of the rock berm while creating suitable microsites for the installation of native plants,
- Eliminate the potential for fish entrapment potential behind the rock berm,
- Plant vegetation on and around the levelled rock berm, and
- Redistribute larger rock fragments below the natural lake boundary for fish habitat.

In the professional opinion of the QPs, the activities outlined in this report did not cause any harmful alteration, disruption or destruction of natural features, functions, and conditions that support fish life processes in the riparian assessment area.

Michael Keefer, PAg #1927
Keefer Ecological Services Ltd.



James Baxter, RPBio #859
Private Consultant, Fisheries Biologist

Scope

March 16, 2023:

- Reduce the height of the rock berm for sections below the natural lake boundary
- Place 10-15 large boulders along the northwest corner of the channel to recreate fish habitat
- Place small-medium size cobbles and boulders along the east side of the channel to recreate fish habitat and construct a stable foundation for a future marine railway system
- Maintain a 2-3 metre (m) wide boulder-free section along the west channel for access (following photos from the Riparian Area Assessment Report submitted on January 13, 2022)

March 25, 2023:

- Reduce the height of the rock berm for sections below the natural lake boundary
- Place small-medium size cobbles and boulders along the east side of the channel to recreate fish habitat and construct a stable foundation for a future marine railway system
- Maintain a 2-3 m wide boulder-free section along the west channel for access (following photos from the Riparian Area Assessment Report submitted on January 13, 2022)

June 14, 2023:

- Plant native vegetation in suitable locations along the east side of the channel
- Confirmed the purchase and delivery of the appropriate top soil mixture for planting of native vegetation
- Evaluate the need for alterations to the rock berm for areas above the natural lake boundary

Additional Notes

While planting the vegetation, the EM noticed that the Douglas-fir appeared to be in less than average health condition. After reaching out to the supplying nursery (Bron & Sons Nursery), KES was notified that the Douglas-fir stock suffered a cold shock the previous fall and many were showing delayed symptoms. Accordingly, the Douglas-fir will be monitored for the remainder of the year and replanted as necessary in the spring of 2024.

Monitoring Record

Time	Actions	Notes
March 16, 2023 09:00	• Arrived on site • Discussed plan with machine operator and site supervisor • Confirmed that maintenance checks were performed on the machine before commencing work • Confirmed the use of a non-toxic and biodegradable hydraulic oil in the machine (ENVIRON MV46)	• EM asked the machine operator to avoid contacting the water as much as possible • The berm was marked with green spray paint to indicate the work limit not to disturb anything above the natural lake boundary
March 16, 2023	• Work with the mini-excavator began	• While moving the first boulder, the machine operator noticed a hydraulic leak in the boom – the site supervisor repaired the leak before work continued

09:20		
March 16, 2023 10:30	• Observed the placement of large boulders in the NW corner of the channel • Provided instruction to place larger boulders in the NE corner • EM provided instruction to pull down the smaller rock material in the NE corner to remove the "wall-like" feature and match the natural shoreline	• Approximately 25% of the work complete • EM observed temporary and unavoidable sedimentation along the shoreline with the movement and placement of material • Decision to make a ramp at the NE corner of the rock berm to provide safe access for the mini-excavator to work on top of the rock berm in the future
March 16, 2023 12:00	• Completed placement of 10-15 NW boulders (confirmed the result is appropriate for fish habitat purposes) • Completed construction of access ramp on the rock berm	• Approximately 50% of the work complete • Confirmed that the lowering of the NE corner of the rock berm to create the access ramp eliminated the pooling potential for fish entrapment • For future work, discussed pulling rocks west off the top of the rock berm and into the channel instead of east on the vegetation – although not ideal for pushing east, permission was granted to do so at the very end if not enough space is available in the channel • Discussed using the natural shoreline as a reference for what the result of the small-medium sized boulder placement should resemble
March 16, 2023 14:00	• Began "trench" on the east side of the channel and placing material on the west side • Placed larger sized boulders in the most NE corner (in the water) to mimic reference shoreline	• Approximately 75% of the work complete • Held a conversation about digging the sand lower down on the east side of the channel to create more room for the removal of material off the rock berm • Plan is to dig approximately 50cm lower, fill with rock layer, replace sand, and add additional rock layer - the approach will create a strong foundation for the future marine railway system, as well as reduce rock material that may need to be pushed east in the final stages
March 16, 2023 16:45	• Filling in of "trench" with small-large boulders – used the mini-excavator bucket to stabilize placed rocks, reducing the likelihood of shifting during work	• 100% of scheduled work complete • Discussed the potential need to use some of the removed sand from the east side of the channel to slope towards the west side gradually should there be a difference in height after rock placement • Reviewed again with the site supervisor what the result should look like and provided an example of acceptable rock sizes and gaps for fish habitat within the completed channel • Discussed the potential to use some of the excavated sand on top of the lowered rock berm to help fill in gaps before topsoil placement and planting • Confirmed the location of the temporary sand stockpile is acceptable as long as it stays above water level (must be moved if lake levels rise)
March 25, 2023 09:00	• Arrived on site • Discussed plan with machine operator and site supervisor • Confirmed that maintenance checks were performed on the machine before commencing work	• Discussed the limits of removing rock berm without disturbing areas above the natural lake boundary • Approved plan to bury one layer of rocks with sand and covering with another layer of rocks to create a sturdy foundation for the marine rail system without compromising fish habitat

		• Instructed to place large boulders to mimic the natural shoreline at the most northeastern edge where the material had been pulled down during the previous construction day
March 25, 2023 09:15	• Work with the mini-excavator began	
March 25, 2023 10:35	• Confirmed boulders were placed along the northeastern edge of the previous berm area to match the surrounding shoreline	• Approximately 25% of the work complete • Advised that the limits of the natural lake boundary had been reached • Work moved from the top of the berm to spreading out the material on the lower portions
March 25, 2023 12:00	• Spreading material from the base of the rock berm across the foundation area on the east side of the channel	• Approximately 50% of the work complete
March 25, 2023 13:40	• Beginning to cover the initial rock layer with sand, packing down with the mini excavator bucket for stability, and placing material from the base of the rock berm on top	• Approximately 75% of the work complete • Discussed keeping the gradient the same as the baseline reference located on a large boulder at the southeast corner of the channel • Discussed the need to contour the east side of the channel down towards the west side to avoid a drop-off between the two
March 25, 2023 16:30	• Ensured the mini excavator was parked correctly and stored on the high point of the land	• 100% of scheduled work complete • Sand pile completely removed from the west side of the channel. • East side of the channel ¾ complete (still need to fill in with more small-medium sized top layer)
June 14, 2023 10:30	• Arrived at site • Met with site supervisor to discuss the plan	• Discussed the location and method for planting
June 14, 2023 10:45	• Soil and plants were brought to site • Planting began along the south east side of the channel, above the high-water mark	• EM noted that the machine operator was not on site, however the rock berm appeared to be leveled appropriately and had adequate fish habitat • Planting also extended further east from the rock berm due to lack of suitable planting conditions (large coarse fragments occupying most of the soil and deadfall)
June 14, 2023 12:30	• Planting was completed	• 100% of the work completed

Photos

Date/Time Description	Photo
March 16, 2023 09:14 - Reference photo of the site before commencing work	

March 16, 2023 09:15 - Green spray paint to mark the limit to construction work without disturbing material above the natural lake boundary	
March 16, 2023 09:29 - Reference of the NW corner of the channel before the placement of large boulders	

March 16, 2023 09:33 - Above view of the channel during the start of the construction	
March 16, 2023 10:36 - Observation of temporary and localized sedimentation	

March 16, 2023 12:09 - NW corner of the channel with all large boulders in place	
March 16, 2023 12:13 - The access ramp on the north edge of the rock berm and the elimination of the potential fish entrapment area	

March 16, 2023 14:15 - Digging of the east side trench	
March 16, 2023 16:52 - The east trenched filled in with material from the rock berm (first layer)	

March 16, 2023 16:57 - Reference photo for suitable rock sizes for the channel	
March 25, 2023 09:11 - The site before beginning construction for the day	

March 25, 2023 10:42 - The NE corner of the berm area completed with the relocation of several large boulders	
March 25, 2023 12:05 - Spreading small-medium rocks from the base of the rock berm onto the east side of the channel	

March 25, 2023 13:44 - Relocating sand from the stockpile on the west side of the channel to the east	
March 25, 2023 15:44 - Relocating sand from the stockpile on the west side of the channel to the east	

March 25, 2023 16:28 - The sand stockpile completely removed from the west side of the channel	
June 14, 2023 11:00 - Planted tree along the eastern edge of the channel	

June 14, 2023 11:15 - Rock berm (appears to be appropriately leveled) with planting on the east side and extending up the hill	
June 14, 2023 11:20 - Northeastern end of the channel	

June 14, 2023 12:00 - Plants on the northeast side of the channel, above the natural lake boundary	

June 14, 2023
12:00

-

Closer view of planted ponderosa pine

June 14, 2023 12:00 - Planted Douglas-fir tree with a long, thin leader	
July 10, 2023 - Overhead view of the completed remediation works (provided by Bevan May)	

RDCK ESDP Proposal Summary

Boathouse Construction & Clifftop Retaining Wall and Fill Area & Lake Pump

Applicant: Bevan and Rhonda May

Address: 10377 Hwy 3A, Sanca, BC

V0B 1A2

Legal Description – Lot 2, District Lot 4595, Kootenay District Plan 4523 (new accretion of land will result in a new legal description associated with this parcel once the registration is complete)

Summary:

This ESDP application is related to work to be done on the above referenced location covering work at lake level related to the construction of a boathouse replacing one that had been on the property for many years, and a second scope of work at the cliff top associated with building a retaining wall along the clifftop perimeter. The ESDP is required as the work is encompassed within the 15 meter setback from the present natural boundary (PNB) of Kootenay Lake.

The earlier work was covered by two previous ESDPs issued by the RDCK, DP2115A and DP2302A related to the site preparation work and subsequent remediation related to first the installation of a Funicular between the lakefront and cottage site at the clifftop. The work associated with both of these earlier DPs is complete.

Boathouse Re-construction Scope

As a part of the earlier work and as communicated to the RDCK during that work process, the existing boathouse foundations were compromised and therefore had to be dismantled. This has been dealt with in conjunction to input from the QEP who was retained to support both of these ESDPs.

Now the owners wish to proceed with the development permit to support the rebuild of a replacement boathouse. The Building Permit associated with this activity will be a separate application.

The attachments to this application include an aerial photograph produced by the Survey contractor showing the property lines subsequent to an accretion process which has now been completed and is winding its way through the administrative process of final registration at Land titles. Upon completion of the accretion process a new legal description will be associated with this parcel of land.

The new boathouse footprint is shown on the aerial photograph/drawing.

Variance:

Of note, the proposed location of the boathouse is driven by the presence of a steep slope/cliff area coming down from the east to a flat elevated lake side area where the boathouse needs to

be squeezed between the cliff/slope and the westerly property line and have a boathouse width to support a boat and to support other water toys such as kayaks, stand up paddle boards and the like.

This therefore results in a variance request being made as a component of this ESDP application.

The specific variance relates to the location of the boathouse relative to the west property boundary shown on the photograph/drawing.

It is the owner's understanding a normal rear property line normally requires a 2.5m setback for any building placements. In this specific case however, the location of the Funicular combined with the presence of a rock cliff to the east means a placement would result in the far northwest corner of the boathouse being .2 m from the West property line. The southwest corner of the boathouse will be greater than the 2.5m setback since the boathouse placement is not parallel with, nor is the property line straight at this part of the property. This detail is shown in the aerial photo.

Boathouse Design

A basic drafting drawing is provided with this application but only for the purposes of general information. The design of the boathouse is continuing to be worked out in conjunction with an architect. A final design of the boathouse will be included with a Building Permit application to be submitted closer to the time the boathouse construction would begin, after all approvals are received.

The boathouse generally is to be in the range of a 16' x 36' structure supporting boat and personal water toy storage. This area will have roughly a 10' ceiling supporting various future boat sizes. A 10' wide garage door will support the boat transferring between the lake and the boathouse. The main floor of the boathouse will also have two mandoors, one located facing north nearest the Funicular base staircase and a second mandoor on the west wall in the southwest corner of the boathouse.

The foundation of the boathouse will be concrete and include potentially 3-4' concrete subwalls supporting woodframe construction walls supporting the whole building. All concrete and construction work will be in accordance with what is required by BC Building Code.

The boathouse will be constructed with finished surfaces that will blend in nicely to the environment by the lakeside with natural tones.

Clifftop Retaining Wall and South Shelf Fill Area Scope

This portion of the project is related to installing a retaining wall that will be 3-4' high along the permitter of a clifftop area on the subject property adjacent to the single family dwelling and further infilling and area to the south of the cliff-top, the south shelf area, below the elevation of the clifftop area.

Whereas the clifftop area by the home is about 70' (22 meters) above the level of the present natural boundary of Kootenay lake, measured laterally, some small portions of the clifftop and south shelf are laterally within the 15-meter setback from the PNB. Only a portion of the work is

inside the 15 m setback area. As such, the owners are including this scope within this ESDP application. One larger tree that is outside the 15 meter setback will be removed on the south shelf to facilitate a unimpeded the fill area.

As highlighted by the Environmental Report there are no negative impacts arising from this scope of work.

The scope of the project is to install concrete engineered architectural blocks along the perimeter of the clifftop. Behind the retaining wall will be various natural fill materials (sand, gravel, topsoil) creating a flat and relatively level yard surface near the house changing the area from various degrees of rocky and variable elevations.

The south shelf portion of the job may incorporate a section of retaining wall that will not exceed 5’ in height if one is installed. Alternatively the south shelf will only be a fill area. Fill in this area will mostly be aggregate pit-run topped with clean crushed gravel, sand, and finally topsoil. Both the clifftop and south shelf areas will be seeded with native grasses

The resulting combined project will create a relatively flat/level plateau area at he clifftop and a second flat/level area comprising the south shelf area.

The project is straightforward and simple.