



REGIONAL DISTRICT OF CENTRAL KOOTENAY

DEVELOPMENT PERMIT

DP2113A -05007.010-Rose_Fraser-DP000118 (DP2113A)

Date: March 23, 2022

Issued pursuant to Section 490 and 491 of the *Local Government Act*

1. This Development Permit is issued to Kristin Linnea Fraser and Jonathan Nigel Rose of 128 Cambrai Avenue SW, Calgary as the registered owners (hereinafter called the "Permittee") and shall only apply to those lands within the Regional District of Central Kootenay, in the Province of British Columbia legally described as LOT A, PLAN NEP77016, DISTRICT LOT 4595, KOOTENAY LAND DISTRICT (PID: 026-134-381) as shown on the attached Schedules 1, 2 and 3, forming part of this Permit, referred to hereafter as the "said lands".
2. This Development Permit is issued subject to compliance with all of the bylaws of the Regional District of Central Kootenay applicable thereto, except as specifically varied or supplemented by this Permit.
3. This Development Permit shall not have the effect of varying the use or density of land as specified in the applicable Zoning Bylaw of the Regional District of Central Kootenay, nor a Floodplain Specification under Section 524 of the Local Government Act.
4. The said lands have been designated 'Country Residential' and are located within a Development Permit Area pursuant to the *Electoral Area 'A' Comprehensive Land Use Bylaw No. 2315, 2013* as amended.
5. The Permittee has applied to the Regional District of Central Kootenay to construct a cantilevered deck, gravel access path to the waterfront and to undertake foreshore restoration including removal of placed fill below the high water mark, removal of stockpiled rock above the high water mark and revegetation of disturbed areas on adjacent Crown lands. Pursuant to this Development Permit and subject to the terms and conditions herein contained, as well as all other applicable Regional District Bylaws, the Regional District of Central Kootenay hereby authorizes the use of the said lands for this purpose.
6. The Permittee is required to obtain approval in writing from the Regional District of Central Kootenay prior to the construction any new buildings, external additions to existing buildings or for any deviation from the development authorized under Section 5 of this Development Permit. Furthermore, the Permittee is hereby advised of the following requirements:
 - 6.1 The Regional District of Central Kootenay Building Department requires that the Permittee obtain a demolition permit and/or building permit prior to the removal of any existing buildings and structures, the renovation, expansion or alteration of any existing building and the construction of any new building.
 - 6.2 Development is authorized in accordance with the terms described in the report titled "*13745 Highway 3A Boswell, BC BC Riparian Assessment*" prepared by Masse Environmental Consultants Ltd., dated January 31, 2022 and attached to this permit as Schedule 3. Conditions of the report can be categorized as follows:
 - 6.2.1 Measures to protect the integrity of the Streamside Protection and Enhancement Area (SPEA). This includes the protection of vegetation and trees

with the SPEA, sediment and erosion control, storm water management, protection of fish habitat, scheduling of environmentally sensitive activities, construction waste management, management of equipment and fuel/lubricant materials and management of invasive plants. All work shall be done in accordance with Sections 6 of the attached report. Notably, the following conditions shall be adhered to:

- 6.2.1.1 It recommended that a certified arborist is retained to assess the health of the five Interior Douglas fir trees located next to the guest house observed to either have damage along the lower trunk and/or as having potential signs of poor health (i.e. resinosus);
- 6.2.1.2 Staging and access should only occur in previously disturbed areas of the site;
- 6.2.1.3 The SPEA boundary shall be flagged prior to work commencing;
- 6.2.1.4 A QEP shall visit the site with the construction contractor prior to development to identify areas of vegetation to be retained and snow fencing to be installed along to protect riparian area;
- 6.2.1.5 In addition to identifying vegetation retention areas, the QEP may make other recommendations regarding material handling and equipment storage to ensure that remaining riparian vegetation is not impacted;
- 6.2.1.6 No pollutants shall be allowed to contaminate the soil around trees in the SPEA;
- 6.2.1.7 The following mitigation measures should be implemented to reduce the risk of sediment input to Kootenay Lake: amount of soil disturbance should be kept to a minimum; any surface runoff should be controlled and directed away from exposed soils; in the event of heavy rainfall, additional mitigation measures such as ditching or covering soils may be required to ensure turbid wastewater does not leave the construction site; soil should be safely stockpiled in a manner that eliminates the possibility of erosion and sediment transport; and, disturbed soils should be revegetated as soon as possible after construction.
- 6.2.1.8 The following mitigation measures will help to decrease stormwater impacts: rainwater collected on roofs should not be allowed to form surface runoff. Downspouts should direct rainwater into suitable landscape features, which can absorb and utilize runoff rather than discharging it directly into Kootenay Lake; and, stormwater discharges must adhere to the *Water Sustainability Act* or any other applicable legislation.
- 6.2.1.9 Works should be scheduled to avoid impacts to the SPEA vegetation, aquatic habitat and nesting birds. Any cutting of riparian vegetation should be completed within the least risk window for nesting birds (August 15-April 15) or will require a nesting survey if completed outside of this window.

6.2.1.10 Development of the property should protect fish habitat by: limiting beach modification to permitted areas and preserve foreshore vegetation and boulder, which provide fish habitat during periods of inundation; adhere to sediment, stormwater, and waste management best practices outline in the Riparian Assessment Report to ensure that there is no release of deleterious material into Kootenay Lake; and, permitting instream works under Section 11 of the Water Sustainability Act and having a QRP present to ensure proper isolation of construction work from aquatic habitat.

6.2.1.11 The most likely source of any contaminant is from equipment or vehicles used or stored on-site, either during fueling or from unanticipated leaks or the failure of a hydraulic hose. To minimize the likelihood and impact of a spill within the riparian area, ensure that: each piece of heavy equipment will be equipped with its own spill response kit; all staff will be familiar with the use of spill kits and their contents; the contents of the kits will be replaced immediately after use; and, equipment will be stored in a designated area as far from Kootenay Lake as possible and secondary containment will be utilized to capture any potential spills or leaks.

6.2.1.12 The following mitigation measures are recommended to reduce the establishment and proliferation of invasive plan species on site: all equipment should be thoroughly washed and inspected before entering the project site to prevent the import of new invasive plants seeds and root fragments; amount of vegetation clearing and soil disturbance should be minimized; and, all exposed soils should be re-vegetated immediately following construction.

6.2.2 In order to restore habitat functions within the disturbed area of the SPEA, the Mitigation Plan outlined in Section 7 of the report attached as Schedule 3 shall be implemented.

7. A building permit shall be required prior to any construction involving land in this location at which time the Permittee shall be required to address sewage disposal issues to the satisfaction of the Interior Health Authority and Regional District of Central Kootenay Senior Building Official.

8. As a condition of the issuance of this Permit, the Regional District shall hold an irrevocable Letter of Credit or certified cheque submitted by the Permittee in the amount of \$24, 678.75 to ensure the landscaping requirements as set forth in Section 6 are completed and in accordance with the following provisions:

8.1 A condition of the posting of the Letter of Credit is that should the Permittee fail to carry out the works and services as herein above stated, according to terms and conditions of this permit within the time provided, the Regional District may use the Letter of Credit to complete these works or services by servants, agents or contractors, and any surplus shall be paid over to the Permittee. If the amount of funds is insufficient to cover the actual cost of completing the works, then the Permittee shall pay such deficiency to the Regional District immediately upon receipt of the Regional District's bill for same.

- 8.2 The Permittee shall complete the landscaping works required by this Permit prior to March 23, 2024. Within this time period the required landscaping must be inspected by the Qualified Environmental Professional who will then send confirmation to the Regional District of Central Kootenay that the work has been done in accordance to their specifications.
- 8.3 If the landscaping is not approved within this time period, the Regional District has the option of continuing to renew the Letter of Credit until the required landscaping is completed or has the option of drawing from the Letter of Credit to complete the required landscaping. In this event, the Regional District or its agents have the irrevocable right to enter into the property to undertake the required landscaping for which the Letter of Credit was submitted.
- 8.4 If the landscaping is approved within this time period without the Regional District having to draw the on the Letter of Credit, 90% of the original amount of the Letter of Credit shall be returned to the Permittee.
- 8.5 A hold back of 10% of the original amount of the Letter of Credit shall be retained until a final inspection is undertaken within 12 months of the date of the original inspection and approval was given to the landscaping. If the landscaping receives approval at final inspection, the 10% hold back will be returned to the Permittee. If after the final inspection, approval of the landscaping is not given, the Regional District has the option of continuing to renew the Letter of Credit until the required landscaping is approved or has the option of drawing on the Letter of Credit the funds to complete the required landscaping. In this event, the Regional District or its agents have the irrevocable right to enter onto the property to undertake the required landscaping for which the Letter of Credit was submitted.
9. The said lands shall be developed strictly in accordance with the terms and conditions of this Development Permit and the requirements of all applicable Regional District Bylaws as well as any plans and specifications which may, from time to time, be attached to this Permit shall form a part thereof.
10. In accordance with the Local Government Act, if the development authorized by this Development Permit is not commenced within two years of the date of this Permit, this Permit shall lapse.
11. In accordance with the Local Government Act, 'Notice' shall be filed in the Land Title Office that the said lands are subject to this Development Permit.
12. The terms of this Development Permit including subsequent amendments, are binding on all persons who acquire an interest in the said lands associated with this Permit.
13. It is understood and agreed that the Regional District has made no representations, covenants, warranties, guarantees, promises, or agreement (verbal or otherwise) with the Permittee other than those in this Development Permit. It is solely the responsibility of the Permittee to ensure that the requirements of all other applicable government agencies are satisfied.
14. This Development Permit does not constitute a building permit.
15. This Development Permit shall come into force and effect 14 days after the date of issuance unless a Waiver of Appeal is received from the Permittee at which time the Development Permit shall be deemed to be issued upon receipt of the Waiver of Appeal. OR If a Notice of Appeal is

received the Development Permit shall be suspended until such time as the Board of the Regional District of Central Kootenay has decided the Appeal.

S Sudan

Sangita Sudan, General Manager of Development Services

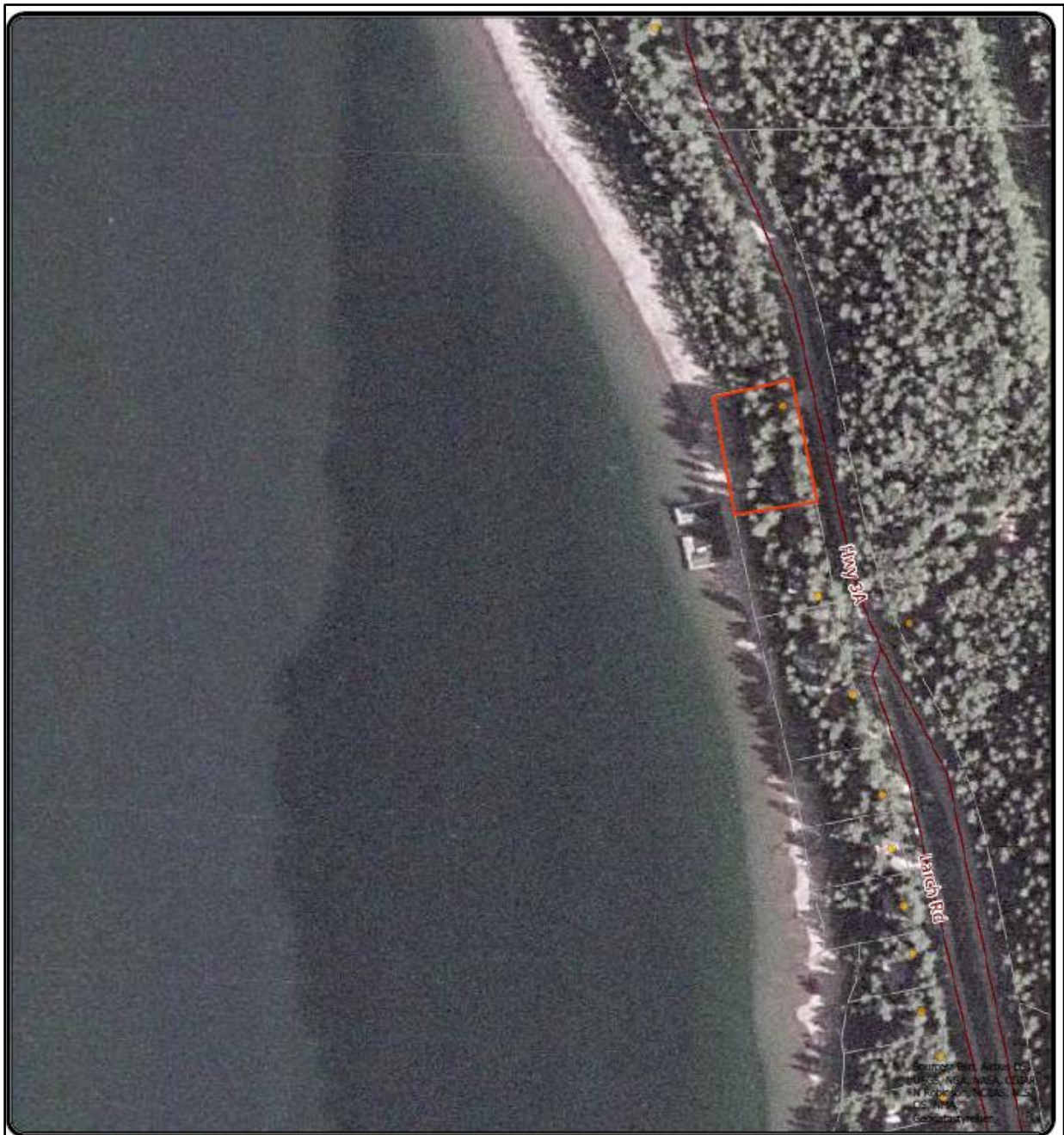
March 24, 2022

Date of Approval (date of review and approval)

March 28, 2022





Date of Issuance (pending receipt of securities)

Schedule 1: Subject Property



REGIONAL DISTRICT OF CENTRAL KOOTENAY
Box 590, 202 Lakeside Drive,
Nelson, BC V1L 5R4
Phone: 1-800-268-7325 www.rdck.bc.ca
maps@rdck.bc.ca

Legend

-  Electoral Areas
-  RDCK Roads
-  Cadastre
-  Civic Address

Map Scale:

1:4,514



Date: December 23, 2021

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 omissions on this map.

Schedule 2: Site Plan

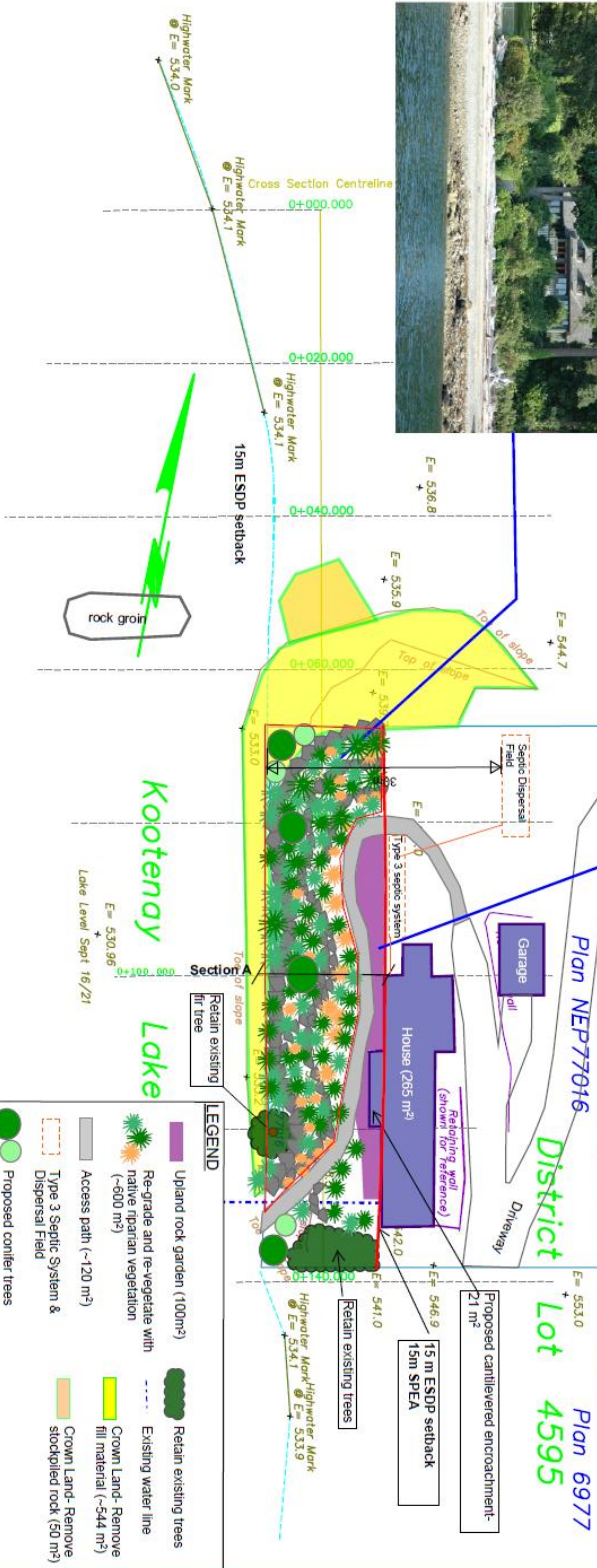
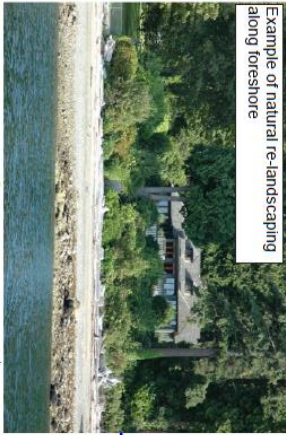
Sketch of site information and cross sections of part of Lot A, Plan NEP77016, District Lot 4595, Kootenay District.

Scale 1:500

All distances are in metres unless otherwise noted. Elevations are geodetic and in metres.

Civic Address: 13745 Highway 3A

Example of natural re-landscaping along foreshore



GRIFITH SURVEYS
R. Griffith Land Surveying Inc.
Box 158 Creston, B. C., V0B 1G0
MM21027 Enviro Sketch B

13745 Hwy 3A, Boswell BC
Proposed Site Plan
Drawn by: F.L.
Date: Jan 31, 2022



The field survey represented by this plan was completed on the 16th day of September, 2021.
Robert A. Griffith, BCLS 568

- LEGEND**
- Upland rock garden (100m²)
 - Re-grade and re-vegetate with native riparian vegetation (~800 m²)
 - Access path (~120 m²)
 - Type 3 Septic System & Dispersal Field
 - Proposed conifer trees
 - Small rock walls < 4' high
 - Retain existing trees
 - Existing water line
 - Crown Land- Remove fill material (~544 m²)
 - Crown Land- Remove studded rock (30 m²)

**Schedule 3: Riparian Assessment, dated January 31 2022 by Masse Environmental Consultants Lt.
for 13745 Highway 3A, Boswell**



**13745 Hwy 3A
BOSWELL, BC**

Riparian Assessment



Prepared for:

Regional District of Central Kootenay

202 Lakeside Drive,

Nelson BC, V1L 5R4

Prepared by:

Masse Environmental Consultants Ltd.

812 Vernon St.

Nelson, BC, V1L 4G4

Jan 31, 2022 V1.1

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ABBREVIATIONS

AHI:	Aquatic Habitat Index
DBH:	Diameter at Breast-Height
FIM:	Foreshore Inventory Mapping
GSC:	Geodetic Survey of Canada
HWM:	High Water Mark
LWD:	Large Woody Debris
FLNRORD:	Forests, Lands and Natural Resource Operations and Rural Development
QEP:	Qualified Environmental Professional
RAR:	Riparian Area Regulation
RDCK:	Regional District of Central Kootenay
ROW:	Right of Way
SPEA:	Streamside Protection and Enhancement Area
WDP:	Watercourse Development Permit
ZOS:	Zones of Sensitivity

13745 Hwy 3A, Boswell BC – Riparian Assessment

1 INTRODUCTION

Masse Environmental Consultants Ltd. was retained by Jonathan Rose (Owner), to conduct a riparian assessment to accompany an application for a Waterfront Development Permit on 13745 Hwy 3a (Lot A, Plan NEP77016, District Lot 4595, Kootenay Land District; PID: 026-134-381). Under an order from the RDCK in the Summer of 2021, the Owner was required to retain an environmental consultant to assess the unauthorized development conducted and proposed development within the environmentally sensitive development permit (ESDP) area.

A site visit was completed on September 8, 2021 by Fiona Lau, B.Tech., A.Sc.T. and Chanel Gagnon, Environmental Tech. to conduct a riparian assessment on the property within the 15 m ESDP area. The riparian assessment evaluates the existing conditions of the property and riparian areas, identifies habitat values, assesses potential environmental impacts, and recommends measures to compensate for the alteration of the riparian area in order to maintain environmental values. The assessment is based on the following regulatory framework and best management practices documents:

- Electoral Area `A` Rural Official Community Plan Bylaw No. 2260, 2013.
- British Columbia *Riparian Areas Regulation*
- Kootenay Lake Shoreline Management Guidelines
- British Columbia *Water Sustainability Act*
- BC Sewerage System Standard Practice Manual – Version 3 (MoH 2014).
- General BMPs and Standard Project Considerations (Ministry of Environment)
- On the Living Edge: Your Handbook for Waterfront Living
- Develop with Care. Environmental Guidelines for Urban and Rural Land Development in British Columbia
- British Columbia Firesmart Homeowners Manual
- Riparian Factsheet No. 6 – Riparian Plant Acquisition and Planting
- A Homeowner’s Guide to Stormwater Management.
- Metro Vancouver- A Homeowner’s Guide to Stormwater Management (MV ND)

This report has been prepared by Fiona Lau B.Tech., A.Sc.T., and reviewed by Sylvie Masse, MSc, RPBio.

I, Fiona Lau, hereby certify that:

- a) I am a Qualified Environmental Professional (QEP), as defined in Section 21 of the *Riparian Areas Protection Regulation* made under the *Riparian Areas Protection Act*;
- b) I am qualified to carry out the assessment of the proposal made by the owner (Jonathan Rose), which is described in Section 2.3 of this Assessment Report (the “development proposal”);
- c) I have carried out my assessment of the development proposal, and my assessment is set out in this Assessment Report; and
- d) In carrying out my assessment of the development proposal, I have followed the specifications of the *Riparian Areas Protection Regulation* and assessment methodology set out in the Minister’s manual.

2 PROJECT OVERVIEW

2.1 Location

The subject property is located in Boswell, BC, and is bordered by private property to the south, MoTI ROW to the east, Crown Land to the north and Kootenay Lake to the west (Appendix 1). The property covers ~0.82 acres with ~69 m of frontage on Kootenay Lake. The property was observed to be dry with a warm western aspect, shallow soils and steep slopes up to 56% slope gradient.

The project area is within the Interior Cedar Hemlock dry warm variant 1 (ICHdw1) biogeoclimatic subzone (MacKillop and Ehman 2016). This moist climatic region is characterized by very hot, moist summers; and very mild winters with light snowfall. Soils generally dry out in late summer for varying extents of time ranging from insignificant to extensive. Snowpacks are very shallow to shallow and of short duration and combined with the mild climate result in no significant soil freezing (MacKillop and Ehman 2016).

2.2 Existing Site Conditions

2.2.1 Watercourses

Kootenay Lake is located along the western boundary of the property. No drainage features or creeks were observed on the subject property. Kootenay Lake's main inflows include the Lower Duncan River to the north and the Kootenay River to the south. It drains through the west arm into the Kootenay River. Kootenay Lake typically experiences one seasonal water level increase annually which occurs in late spring and early summer months (late May through July). Lake levels can vary by up to 4 m throughout the year affecting the extent of exposed shoreline.

During the site visit, the visible high-water mark (HWM) of Kootenay Lake was confirmed at ~534.0 m elevation, approximately the natural boundary line as shown on the legal survey completed in 2021 by Griffith Surveys (Appendix 2). Based on the definition of natural boundary, the natural boundary shown on the survey will be used as the HWM from which the streamside protection area setbacks will be determined as per the Riparian Area Protection Regulation.

"Natural Boundary" means the visible high water mark of any lake, river, stream or other body of water is 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 body of water a character distinct from that of its banks, in vegetation, as well as in the nature of the soil itself."

2.2.2 Existing Development

The property was originally developed prior to 2013 before Watercourse Development Permit Areas were in effect. Pre-existing development within the property included a single family home (SE quadrant of property), terraced gardens (SW quadrant of property), a firepit (SW corner adjacent to beach), and an access road with armoured rock banks from the existing house down to the foreshore (Photo 1; Appendix 2). The siting of the pre-existing development was estimated based on Photo 1 and ortho-imagery

13745 Hwy 3A, Boswell BC – Riparian Assessment

from Google Earth and RDCK mapping. It appears that the existing lower portion of the access road encroached into Kootenay Lake on Crown Land. According to Photo 1, the 15 m ESDP area on the subject property was sparsely forested.

Existing structures and landscaping were removed during the re-grading works completed in 2020/2021 in preparation for the proposed new development. A stepped descending profile was created between Hwy 3a and the shoreline of Kootenay Lake. Refer to Appendix 3 for current site survey and site profile prepared by Griffith Surveys on September 16, 2021. Works within the ESDP area were completed without a development permit. Material from the upper half of the property was scraped and pushed down to the lower half of the property to create a large level area, elevated up to 3.5 m above the beach elevation, which encroached into Crown Land both to the north and west (Photos 2 and 3). The bank was graded to a $\sim 1:1$ slope, geotextile cloth placed, and armoured with angular rock (Photos 2-4). The building permit is currently on hold until a Development Permit is approved.



Photo 1. Historical photo of site, date unknown. area.



Photo 2. View of property from water looking east, Summer 2021.



Photo 3. Fill encroachment along the foreshore, looking north, Sept 8, 2021.



Photo 4. View of re-grading within riparian setback, Sep 8, 2021.

2.3 Proposed Development

The proposed development within the 15 meter ESDP area will involve the following activities:

- New home construction cantilevered into the ESDP area (21 m² footprint);
- New gravel access path down to the waterfront (~120 m²);
- Foreshore restoration - Re-grading back to natural gradients and re-vegetating with native plant species (~760 m²).

Refer to Appendix 4 for Proposed Site Plan. In addition to restoration within the subject property, foreshore restoration within Crown Land is proposed. This work requires a Section 11 Authorization under the Water Sustainability Act and Permission to work on Crown Land. The Section 11 Application (Tracking #100335355) for proposed restoration works was submitted to Front Counter BC on Nov 18, 2021. Proposed work on Crown Land includes:

- Removal of placed fill located below the high water mark (160 m²) and above HWM (~384 m²).
- Removal of stockpiled rock above the high water mark (~50 m²).
- Re-vegetation of disturbed areas with native riparian species (~400 m²).

2.3.1 New Home Construction

The proposed new home with a 265 m² footprint is sited mostly outside of the ESDP area with exception to the cantilevered living room and roofline which encroaches up to 2 m into the 15 m ESDP area. The cantilevered living room is elevated off the natural ground by 1.0 m- 1.6 m, while the roofline is at least 5.8 m above the ground.

2.3.2 Gravel Access Path

A gravel access path, two meters in width, is proposed within the 15 ESDP area. The path is located mostly between the 10- 15 m setback with exception to the SW property corner where it accesses down to the beach. The access path is gently sloped to accommodate both walking and a small all terrain vehicle (atv).

2.3.3 Restoration of 15 m ESDP Area

The proposed restoration of the 15 m ESDP area will involve restoring the entire foreshore area by de-constructing the armoured bank, removing geotextile cloth and fill material to approximate natural bank gradient (~30-40 % slope), incorporating small < 1.2 m high rock retaining walls to create large planting pockets, placing landscape cloth where necessary, importing growing medium and re-vegetating area with native riparian plant species. Refer to Section 7.1 for site revegetation prescription. Due to the naturally steep topography and the rocky nature of the riparian area, small rock retaining walls will be necessary to retain growing medium for planting purposes. This work will be completed using an excavator from the top of the bank and pulling material back into private property. Some of the rock and fill will be re-used for retaining walls and re-grading, while most of the rock and fill material will be relocated to outside of the 15 m ESDP area or completely off site. This work will be field fit by the landscape contractor with recommendations made by the Qualified Environmental Professional (QEP) and Owner.

2.4 Services

Domestic water for the proposed home will be extracted from Kootenay Lake under an existing water license using the existing water line. The waterline is located approximately ~5 m north of the south property line and is depicted on the site plan (Appendix 4). The proposed septic plan is to install a Type 3 septic system located outside of the 15m ESDP area and in accordance with the BC Sewerage System Standard Practice Manual – Version 3 (MoH 2014). Septic tank, treatment chamber and pump chamber will be located on the north side of the house and effluent will be pumped to the dispersal field located to the north-east, ~30 m from the HWM of Kootenay Lake. A sewerage application has been prepared by a qualified engineer and has been approved by Interior Health.

3 REGULATORY REVIEW

3.1 Streamside Protection and Enhancement Area

The default ESDP area is 15 meters from natural boundary of Kootenay Lake. To determine whether the 15 m ESDP setback from the High Water Mark (HWM) of Kootenay Lake aligns with Riparian Area Protection Regulation (RAPR) criteria, a detailed assessment of the subject property was conducted to calculate the Streamside Protection and Enhancement Area (SPEA) setbacks. Results for the Zones of Sensitivity (ZOS) and SPEA are presented in Table 1 and Appendix 3.

As per the RAPR, the large woody debris (LWD), and litter ZOS were plotted 15 m inland from the HWM of Kootenay Lake, with the shade ZOS plotted 0 m from the HWM. The SPEA setback is determined based on the ZOS with the greatest width. Therefore, within the subject property the SPEA from the HWM of Kootenay Lake is 15 m.

The BC Riparian Areas Regulation (BC 2015) defines "High Water Mark" and "Stream" as follows:

"High Water Mark" means the visible high water mark of a stream 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 stream 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."

"Stream" includes any of the following that provides fish habitat:

- (a) a watercourse, whether it usually contains water or not;
- (b) a pond, lake, river, creek or brook;
- (c) a ditch, spring or wetland that is connected by surface flow to something referred to in paragraph (a) or (b).

Table 1. Results of detailed RAPR assessment.

Feature Type	SPVT ¹	Zones of Sensitivity			SPEA
		LWD	Litter fall	Shade	
Kootenay Lake	TR	15 m	15 m	0m	15 m

¹ SPVT: site potential vegetation type (TR-tree)

13745 Hwy 3A, Boswell BC – Riparian Assessment

3.2 Kootenay Lake Shoreline Management Guidelines

The Kootenay Lake Foreshore Inventory Mapping (FIM) and the Kootenay Lake Shoreline Management Guidelines documents (EEC 2016, KLP 2018) were used to help determine the site specific risks for riparian habitat, Ktunaxa Nation cultural values, and archaeological resources along the shoreline. The property (13745 Hwy 3a) is within FIM segment 155, while the Crown Land portion impacted to the north is within FIM Segment 156. Table 2 provides the environmental and archaeological risk results identified in the FIM.

Table 2. Environmental and archaeological risk results.

Segment	Aquatic Habitat Index Rating (AHI)	Aquatic Sensitivity	Archaeological Risk	Enhanced Engagement Required
155	High	Yes	Yellow	No
156	Moderate	Yes	Yellow	No

4 RESOURCES

4.1 Fish and Aquatic Habitat

4.1.1 Kootenay Lake

The foreshore area is gently sloped beach (up to ~10 % gradient) with substrate predominantly cobble and gravel with some small boulders (Photos 5 and 6). Fish habitat along the foreshore supports juvenile rearing habitat. Small fry are able to utilize the cobble and boulder substrate for cover. Signs of historical beach grooming were present with some areas of the beach lacking larger cobble and boulder (Photo 7). It is suspected that this rock was relocated to create a rock groin (15 m x 5m) present at the north end of the property (Photo 8). No known spawning has been reported in this area. Emergent vegetation along the foreshore north of the property consists of sandbar willow (*Salix exigua*), red osier dogwood (*Cornus stolonifera*), common horsetail (*Equisetum arvense*), pasture sage (*Artemisia frigida*) and lance leaved aster (*Symphotrichum lanceolatum*) (Photo 9). Kootenay Lake supports a variety of fish species, including several species of regional interest, such as Rainbow Trout (*Oncorhynchus mykiss*), Bull Trout (*Salvelinus confluentus*), Kokanee (*O. nerka*), White Sturgeon (*Acipenser transmontanus*), Westslope Cutthroat Trout (*O. darki lewisi*), and Burbot (*Lota lota*). A mussel survey conducted in March 2021 by Masse Environmental within the breakwater structure directly to the south of the property found no mussels present (Photo 10).

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Photo 5. View of beach area fronting the property, Sept 8, 2021.



Photo 6. View of typical instream substrate, Sept 8, 2021.



Photo 7. View of groomed beach area, Sept 8, 2021



Photo 8. View of rock groin, north of property, Sept 8, 2021



Photo 9. Emergent vegetation along the beach area, north of the property, Sept 8, 2021.



Photo 10. View of breakwater structure south of property, Sep 8, 2021.

4.2 Riparian Vegetation

Due to the recent earthworks completed on the subject property, the natural topography has changed substantially (Refer to Appendix 3). The riparian area has been disturbed by the removal of conifer trees and placement of fill material on top of the native soils. The total amount of trees removed is unknown; however, a few conifer trees were retained in the southwestern corner of the property within the ESDP area. A mature Douglas fir (*Pseudotsuga menziesii*) tree located along the foreshore was backfilled around, which may slowly suffocate the root system (Photo 11). The fill material and rock armour placed within the riparian area does not provide any growing medium potential for natural plant recruitment.

Due to the minimal riparian vegetation occurring on the subject property, a survey of the adjacent riparian areas to the north and south of the property was conducted to identify native species naturally occurring (Photos 11 to 14). Riparian vegetation is a mixed young conifer and deciduous forest consisting of Douglas fir, grand fir (*Abies grandis*), Western hemlock (*Tsuga heterophylla*), Western red cedar (*Thuja plicata*), paper birch (*Populus tremuloides*), alder sp (*alnus sp.*), douglas maple (*Acer glabrum*), with understorey vegetation consisting of blue elderberry (*Sambucus caerulea*), oregon grape (*mahonia aquifolium*), silverleaf phacelia (*Phacelia hastata*), snowberry (*Symphoricarpos albus*), soopalalie (*Shepherdia canadensis*) and willow sp (*Salix sp.*). Non-native species observed included alfafa (*Medicago sativa*), great mullein (*Verbascum thapsus*), plantain (*Plantago major*), reed canary grass (*Phalaris arundinacea*), and spotted knapweed (*Centaurea maculosa*).



Photo 11. View of backfill and rock placed around mature fir tree along foreshore.



Photo 12. View of riparian area north of property on crown land.



Photo 13. View of typical riparian vegetation north of property.



Photo 14. View of typical riparian vegetation south of property.

4.3 Wildlife Habitat

4.3.1 Reptiles and Amphibians

The riparian area in its current state does not provide good habitat for reptiles such as northern alligator lizard (*Elgaria coerulea*), western skink (*Plestiodon skiltonianus*) or garter snakes (*Thamnophis* spp.), due to the high level of disturbance, lack of vegetation and cover. Interspatial habitat along the armoured rock bank may provide some cover habitat; however, the thick geotextile cloth placed underneath would be a barrier for burrowing and hibernation activities. Once the proposed re-vegetation has established, it is expected that this area will become more attractive to reptiles.

4.3.2 Birds

No birds were observed during the assessment; however, the subject property was likely visited by songbirds, waterfowl, and raptors prior to recent development activities. No nests were observed during the site assessment. The retained vegetation at the SW corner of the property provides some suitable nesting habitat for songbirds, perch habitat for raptors and potential feeding and cavity habitat for sapsuckers and other cavity dwellers. Proposed re-vegetation within the riparian area will likely increase potential nesting and feeding habitat for songbirds.

4.3.3 Mammals

The property in its current state does not provide any potential habitat for ungulates, bears and small mammals. Once the riparian area has been re-established, riparian vegetation will provide forage habitat for ungulates, and cover for small mammals.

4.4 Species at Risk

A 10 km buffer around the subject property was used to query BC Conservation Data Center records using the [CDC iMap](#) tool. Based on this query, two species at risk occurrences are known within the 10 km of the project area:

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- 1) The Upper Kootenay River white sturgeon (*Acipenser transmontanus*) population. The nearest white sturgeon Critical Habitat is at the Crawford Creek delta ~9 km north of the property (Environment Canada 2014).
- 2) Western skink (*Plestiodon skiltonianus*) recorded observation ~4.0 km away on the opposite shoreline of Kootenay Lake at approximately the same latitude. Subject property provides potential skink habitat.

4.5 Archaeological Resources

Kootenay Lake is part of the traditional territory of the Sinixt, Okanagan and Ktunaxa First Nations and archaeological evidence is documented at multiple shoreline sites. A review of archaeological resources on this property is outside the scope of this report.

5 IMPACT ASSESSMENT

The proposed development was assessed based on pre-existing development, current site conditions and proposed development within the ESDP area. Table 3 summarizes the types of development, estimated areas, and associated benefits and impacts. The affected area calculations are those within the private property boundary and do not include the proposed restoration activities on Crown Land.

Table 3. Impact assessment.

Status	Disturbance Type	Affected Area	Riparian Benefits and Impacts
Pre-existing (Prior to 2019)	<ul style="list-style-type: none"> • Gravel access road • Armoured rock banks • Firepit area • Terraced gardens 	~405 m ²	<p>Benefits-Retention of some larger conifer trees and native soils for natural plant recruitment.</p> <p>Impacts- Riparian habitat loss, non-vegetated areas, potential for erosion along access road, potential for invasive species establishment.</p>
Current (2021)	<ul style="list-style-type: none"> • Riparian vegetation removal • Re-grading and filling • Rock armouring • Temporary access road 	~850 m ²	<p>Benefits-None</p> <p>Impacts- Floodplain habitat loss, riparian habitat loss, loss of riparian function and wildlife habitat, extensive exposed soils, potential for erosion and sediment, potential for invasive species establishment, lack of top soil for native plant recruitment and change of site drainage.</p>
Proposed (2022)	<ol style="list-style-type: none"> 1. Home Development- Living room and roofline cantilevered into the SPEA 2. Gravel Access Path (2 m wide for ATV access) 	<p>~21 m²</p> <p>~ 120 m²</p>	<p>1. Benefits- Allows some light under structure for plant growth and maintains access for small mammal and reptiles.</p> <p>Impacts- Shading within riparian area, non-pervious surface, limited vegetation establishment under the cantilevered area.</p> <p>2. Benefits-Designated access down to beach area, pervious, non-erodible gravel surface.</p> <p>Impacts-Loss of potential riparian habitat.</p>

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Status	Disturbance Type	Affected Area	Riparian Benefits and Impacts
	3. Restoration of SPEA- Restoration of natural slope gradients and re-vegetation with native plants.	~700 m ²	4. Benefits- Restoration of riparian area function over time, wildlife habitat creation, soil stabilization, riparian area buffer, improvement to site drainage. In addition, emergent vegetation planting along natural boundary will minimize erosion potential along foreshore. Impacts- Short- term disturbance of soils and noise during construction period.

The most significant impact associated with both pre-existing and current site developments is the permanent removal of riparian vegetation within the SPEA, which decreases riparian vegetation function, ultimately affecting the health and productivity of aquatic ecosystems. This includes future loss of large woody debris recruitment, shade potential, water temperature regulation and nutrient input including litter fall and insect drop. In addition, the removal of riparian vegetation and increased human activity within the riparian area reduces wildlife habitat for birds, mammals, reptiles, and amphibians, increases noise and light disturbance to local wildlife, increases erosion and sediment potential, and stormwater runoff.

Provided that measures to protect the SPEA are followed and the recommended mitigation plan is implemented, negative wildlife and riparian impacts from the proposed development will be reduced and riparian function should be restored overtime.

6 MEASURES TO PROTECT THE INTEGRITY OF SPEA

This section provides measures to protect the integrity of the SPEA as described in RAPR, as well as recommended best management practices.

6.1 Danger Trees

Overall tree cover on the site is sparse; however, no hazard tree indicators were observed. A certified danger tree assessor was not retained as a part of this assessment.

6.2 Windthrow

There is potential windthrow risk to the single Douglas fir tree which was retained along the foreshore at the SW corner of the property. Further assessment of windthrow risk is beyond the scope of this report, and any such assessment should be led by a Registered Professional Forester (RPF) or qualified practitioner.

6.3 Slope Stability

No slope stability hazard indicators were observed during the site visit. A geotechnical assessment was conducted by Deverney Engineering in July 2021 . Further assessment of geotechnical hazard is beyond the scope of this report, and any such assessment should be led by a P.Geo, or P.Eng.

6.4 Protection of Trees and Vegetation in the SPEA

Protection of remaining trees and other vegetation in the SPEA can be achieved by implementing the following measures:

- Staging and access should only occur in previously disturbed areas of the site.
- Retention of conifer trees and vegetation at SW corner.
- Removal of imported fill material placed around the Douglas fir tree to the dripline of the tree. This activity shall be monitored closely to ensure that the native ground is exposed but not further disturbed to prevent damage to the root system.
- No pollutants should be allowed to contaminate the soil around existing trees.

6.5 Encroachment

As the proposed development occurs within the SPEA, further development beyond the previously disturbed areas and restoration areas is discouraged to promote re-establishment of riparian vegetation and preserve the function of the remaining riparian vegetation at the SW corner. Any future development proposed within the SPEA will require a QEP review and an Environmentally Sensitive Watercourse Development Permit.

6.6 Erosion and Sediment Control

The following mitigation measures should be implemented to reduce the risk of erosion and sediment input to Kootenay Lake:

- Any surface runoff should be controlled and directed away from exposed soils.
- During construction ditching, gravel check dams, sediment ponds shall be implemented and maintained.
- In the event of heavy rainfall, additional mitigation measures such as ditching or covering soils may be required to ensure turbid wastewater does not leave the construction site.
- Excavation to remove part of the imported fill should be monitored closely to ensure that the native ground is exposed but not further disturbed.
- Soil should be safely stockpiled outside of the 15 m riparian setback in a manner that eliminates the possibility of erosion and sediment transport.
- Disturbed soils should be revegetated as soon as possible.

6.7 Stormwater Management

The proposed development has resulted in an increase in the total impervious area of the property from the proposed home development. The following mitigation measures will help decrease stormwater impacts:

- Downspouts from new home should direct rainwater into suitable landscape features which can absorb and utilize runoff.
- Stormwater discharges must adhere to the *Water Sustainability Act* or any other applicable legislation.

6.8 Floodplain Concerns

The proposed foundation of the new home is located outside of the 15 meter floodplain setback of Kootenay Lake and above the 536.5 m flood construction level.

6.9 Scheduling of Environmentally Sensitive Activities

Works should be scheduled to avoid impacts to SPEA vegetation, aquatic habitat, and nesting birds. The best timing for proposed work is September-April when Kootenay Lake water levels are low. Works in and around existing trees and shrubs should be monitored for nesting birds if works are completed during the breeding bird season which extends from April 1 to August 15, to minimize disturbance.

6.10 Protection of Fish Habitat

Protection of fish habitat shall be implemented by:

- Limit beach modification to permitted areas.
- Adhere to erosion and sediment control, stormwater, and waste management best practices outlined in this report to ensure that there is no release of deleterious materials into Kootenay Lake.

6.11 Management of Equipment and Fuel/Lubricant Materials

The most likely source of any contaminant is from equipment or vehicles used or stored on-site, either during fueling or from unanticipated leaks or the failure of a hydraulic hose. To minimize the likelihood and impact of a spill within the riparian area, ensure that:

- Each piece of heavy equipment will be equipped with its own spill response kit.
- All staff will be familiar with the use of spill kits and their contents. The contents of the kits will be replaced immediately after use.
- Equipment will be stored in a designated area as far from Kootenay lake as possible and secondary containment will be utilized to capture any potential spills or leaks.

6.12 Invasive Plant Management

Construction activities have the potential to increase prevalence of invasive plant species which can out-compete native riparian vegetation, causing damage to habitat and ecosystem function. The following mitigation measures are recommended to reduce the establishment and proliferation of invasive plant species on site:

- All equipment should be thoroughly washed and inspected before entering the project site to prevent the import of new invasive plant seeds and root fragments.
- Amount of soil disturbance should be minimized.
- All exposed soils should be re-vegetated immediately following construction.

7 MITIGATION PLAN

The Shoreline Management Guidelines for Kootenay Lake outlines general principles for shoreline development in order to achieve a “No Net Loss” of habitats present. The principle is achieved by applying the following priority sequence of mitigation options: 1. *Avoidance* of environmental impacts; 2. *Minimization* of unavoidable impacts; 3. On-site *restoration*; and 4. *Offset* residual impacts that cannot be minimized through compensation (KLP 2018). Avoidance was not achievable with the existing and proposed development as the disturbance has already occurred; therefore, mitigation measures to minimize proposed new development and restoration of the disturbed riparian area are being recommended and are described in the following sections. Refer to Appendix 4 for conceptual site and restoration plan.

New Development- Minimize

The proposed new home foundations are sited outside of the SPEA; however, 21 m² of the home is cantilevered into the SPEA. A new gravel access path (~2m wide) to access the foreshore is proposed mostly within the 10-15 m setback except for the SE corner where it accesses onto the beach. The access path footprint has been minimized compared to the pre-existing access road which was >3 m wide. The proposed alignment and slope allow a large un-interrupted vegetated buffer between the pathway and foreshore as well as minimize surface erosion potential.

Re-grading and Revegetation- Onsite restoration.

Restoration within the foreshore area involves de-constructing the armoured bank, removing fill material from below the natural boundary back to the 15 m setback, re-grading to approximate natural bank gradients (~30-40 % slope), incorporating small < 1.2 m high rock stack retaining walls to create large planting pockets, placing landscape cloth where necessary, importing growing medium and re-vegetating area with native plant species. The objective of this restoration area will be to create shrub habitat with larger trees interspersed throughout. The upland area between the access trail and proposed new home is naturally steep and rocky with areas of exposed bedrock. To work with the natural topography of the site, an upland rock garden area is proposed in this location. The rock garden will be beneficial for reptiles by providing interspatial cover habitat and sunning and basking areas. In addition, plant species selected will improve pollinator habitat by attracting bees, butterflies, hummingbirds and moths. Landscaping will be field fit by the landscape Contractor, with direction and recommendations made by the QEP and Owner. The overall goal of the restoration will be to naturalize the riparian area and create a non- landscaped garden look.

7.1 Site Revegetation

The proposed revegetation is designed with a focus on naturalizing the foreshore and creating a vegetation buffer between the development and foreshore area. The revegetation prescription on private land includes two specific planting areas: riparian and upland rock garden. Both areas will require re-grading and re-vegetating with a combination of native potted stock (4” to 10 gallon pot size) and re-seeding with specifically formulated herbaceous seed blends to promote shrub and rock garden habitat establishment.

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The final plant species selection and quantities shall be determined by the Landscaper and QEP in consultation with the Owner and will be dependent on plant availability at the time of ordering. The landscape design shall provide mixed plant structure and layering, which meets or exceeds the below prescription. The proposed revegetation will require ongoing maintenance (ie. irrigation and weeding), until they become naturalized over the moderate to long term.

Revegetation of disturbed areas within private property will include:

Riparian Area (~600 m²)

- Plant trees (min 2 m in height) at ≥ 3 meter spacing in minimum 1.3 m deep soil. Refer to Table 4 for recommended plant species.
- Plant shrubs at >1 m spacing with a mixture of flowers, grasses and groundcover species interspersed throughout. Refer to Table 4 for recommended plant species and pot sizes.
- Planting holes shall be three times the pot size.
- Lightly mulch around planted potted stock.
- Re-seed exposed soils by raking top 2 inches of planting area to loosen soil. Spread seed mix on soil at a rate of 25 kg/Ha. Refer to Table 5 for recommended seed mix.

Upland rock garden (~100 m²)

- Pocket plant flowers and groundcover species. Refer to Table 4 for recommended plant species and pot sizes.
- Add growing medium to each planting pocket, as required.
- Re-seed any exposed soils by raking top 2 inches of planting area to loosen soil. Spread seed mix on soil at a rate of 25 kg/Ha. Refer to Table 5 for recommended seed mix.
- Refer to Kootenay Native Plant Society website for recommendations on pollinator plant selection and plant and seed availability <http://kootenaynativeplants.ca/get-involved/native-plants-for-native-pollinators/>.

General Planting and Maintenance Guidelines

- Planting should not occur during periods of hot dry weather unless they are irrigated daily.
- Native riparian seed blend specially formulated for riparian area application is available at Interior Seed & Fertilizer <https://interiorseedandfertilizer.ca> (Table 5).
- Locally adapted native plants are preferable to those collected or grown outside the region. The species listed in Table 4 are available from Sagebrush Nursery in Oliver <https://sagebrushnursery.com> , or Nupqu Native Plants <https://nupqu.com/native-plants-nursery-home/> near Kimberley.
- Plant selection shall be completed by Landscaper, in consultation with the QEP and Owner.
- Planting holes shall be a minimum of 3 times the size of the pot.
- Specific locations of plants shall be directed by a QEP or landscaper.
- Use transplant fertilizer (ie. Mykes Mycorrhizae Tree and Shrub or similar) as per manufacturers specifications in each planting hole.

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- Plantings which do not survive should be replaced to ensure complete establishment of native plants, and exclusion of exotic plants.
- Ensure the objective of the restoration is to naturalize the riparian area and not create a landscaped garden.
- Regularly irrigate new plantings during the plant establishment period for a minimum of 5 years and thereafter as required.
- Pull any invasive weeds on a yearly basis prior to going to seed.
- Replanting of riparian vegetation around buildings should adhere to principles of rural residential fire protection (for more information see the FireSmart Homeowner's Manual MFLNRO N.D.).

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Table 4. Recommended plant list.

Common Name	Latin name	Recommended Pot Size
Trees		
Douglas fir	<i>Pseudotsuga menziesii</i>	#10
Mountain pine	<i>Pinus mugo</i>	#10
Rocky mountain juniper	<i>Juniperus scopulorum</i>	#10
Western red cedar	<i>Thuja plicata</i>	#10
Tall Shrubs		
Blue elderberry	<i>Sambucus cerulea</i>	#1, #2 or #5
Douglas maple	<i>Acer glabrum</i>	#1, #2 or #5
Nootka rose (flood tolerant)	<i>Rosa nutkana</i>	#1, #2 or #5
Mallow ninebark	<i>Physocarpus malvaceus</i>	#1, #2 or #5
Oceanspray	<i>Holodiscus discolor</i>	#1, #2 or #5
Pacific Willow (flood tolerant)	<i>Salix lucida</i>	#1, #2 or #5
Red flowering currant	<i>Ribes sanguineum</i>	#1, #2 or #5
Red osier dogwood (flood tolerant)	<i>Cornus stolonifera</i>	#1, #2 or #5
Sandbar willow (flood tolerant)	<i>Salix exigua</i>	#1, #2 or #5
Saskatoon	<i>Amelanchier alnifolia</i>	#1, #2 or #5
Scoulers willow or sitka willow (flood tolerant)	<i>Salix scouleriana or sitka</i>	#1, #2 or #5
Low shrubs		
Common snowberry	<i>Symphoricarpos albus</i>	4" or #1
Creeping juniper	<i>Juniperus horizontalis</i>	4" or #1
Goat's beard	<i>Arunucus dioicus</i>	4" or #1
Pink spirea	<i>Spirea douglasii</i>	4" or #1
Tall Oregon grape	<i>Mahonia aquifolium</i>	4" or #1
Grasses and Flowers		
Blue fescue	<i>Festuca glauca</i>	4" or #1
Blue joint grass (flood tolerant)	<i>Calamagrostis canadensis</i>	4" or #1
Canada Goldenrod	<i>Solidago altissima</i>	4" or #1
Douglas' aster	<i>Symphyotrichum subspicatum</i>	seed
Heart-leaved arnica	<i>Arnica cordifolia</i>	4" or #1
Little blue stem 'Pixie Fountain'	<i>Schizachyrium scoparium</i>	4" or #1
Native Tufted Hairgrass	<i>Deschampsia cespitosa</i>	4" or #1
Nodding onion	<i>Allium cernuum</i>	4" or #1
Pearly everlasting		seed
Round-leaved alumroot	<i>Heuchera cylindrica</i>	seed
Showy jacobs ladder	<i>Polemonium pulcherrimum</i>	seed
Silky lupine	<i>Lupinus sericeus</i>	4" or #1
Wooly sunflower or alternate native plant	<i>Eriophyllum lanatum</i>	4" or #1
Yarrow	<i>Achillea millefolium</i>	seed, 4" or #1
Groundcovers		
Douglas moss phlox	<i>Phlox douglassii or similar</i>	4"
Falsebox	<i>Paxistima myrsinites</i>	4" or #1
Kinnikinnick	<i>Arctostaphylos uva-ursi</i>	4" or #1
Lance-leaved stone crop or similar	<i>Sedum lanceolatum or sedum sp.</i>	4"
Rock cress	<i>Aubrieta deltoidea</i>	4"
Spotted saxifrage	<i>Saxifraga bronchialis</i>	4"

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Table 5. Recommended seed mix blend for shrub habitat.

Native Riparian Blend 1	% weight	% by species
slender wheatgrass	25.0%	18%
streambank wheatgrass	25.0%	18%
fringed brome grass	24.7%	9%
northern wheatgrass	20.0%	14%
sheep fescue	3.0 %	10%
tufted hairgrass	1.0 %	11%
fowl bluegrass	1.0 %	9%
yarrow	0.3 %	3%

7.2 Crown Land Revegetation

For reference purposes only, the proposed restoration area on Crown Land to the west and north of the property will be re-vegetated in accordance with the Section 11 Authorization. This will include:

- Plant a minimum of 40 flood tolerant species (1 gallon pot size) along the natural boundary.
- Native beach substrate shall be raked back around the plantings to a minimum depth of 3" to help protect soils from erosion.
- Plant a minimum of 20 shrubs (1 gallon pot) and 5 conifer trees (5 gallon pot) within the riparian area on Crown Land.

8 ENVIRONMENTAL MONITORING

The anticipated effort for environmental monitoring and professional guidance on this project includes the following:

- QEP will be onsite for a pre-construction meeting with Owner and Contractor to ensure that all parties are aware of environmental sensitivities and familiar with the proposed mitigation measures.
- QEP to provide guidance during revegetation, as required.
- QEP will conduct a post construction site visit once planting is complete to assess compliance and completion of the project and submit an environmental summary report to the RDCK.
- QEP will conduct yearly effectiveness monitoring for a three year period. The following indicators of success of riparian plantings should be documented:
 - Plant composition includes mostly native trees and shrubs.
 - Establishment of >80% of planted riparian species after 3 full years would be a reasonable indication that the mitigation plan has been successfully completed.
- QEP will prepare an effectiveness monitoring report with findings and recommendations on a yearly basis for up to 3 years.

9 CONCLUSION

Overall, the mitigation plan as proposed will help mitigate the environmental impacts caused by unauthorized activities within the ESDP area. The proposed development within the ESDP area will cause

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some loss of riparian habitat; however, as the restoration areas become re-established with native species, the riparian function should become restored along the foreshore over time.

10 CLOSURE

This report has been prepared by a Qualified Environmental Professional (QEP) who has not acted for, or as an agent(s) of the RDCK and was at the expense of the property owner.

I, Fiona Lau, certify that I am qualified to carry out this assessment; and that the assessment methods under the Regulation have been followed; and that, in my professional opinion:

- (i) if the development is implemented as proposed, or
- (ii) if the streamside protection and enhancement areas identified in the report are protected from the development, and
- (iii) if the developer implements the measures identified in the report to protect the integrity of those areas from the effects of the development,

then there will be no harmful alteration, disruption or destruction of natural features, functions and conditions that support fish life processes in the riparian assessment area.

If you have any comments or questions, please do not hesitate to contact the undersigned.

Sincerely,



Fiona Lau, ASCT, BTech.
fiona@masseenvironmental.com

Reviewed by:



Sylvie Masse, RPBio, MSc.
Masse Environmental Consultants

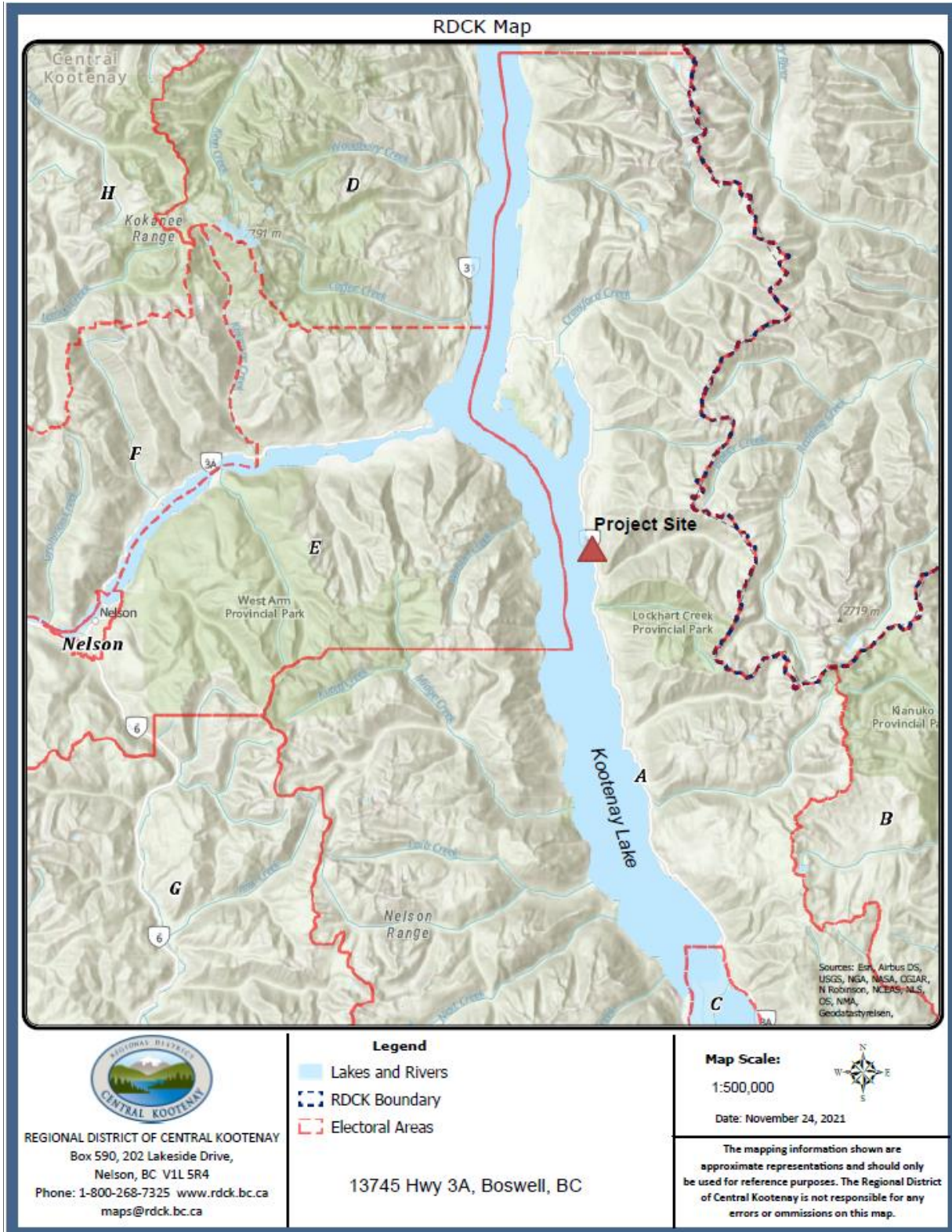
11 REFERENCES

- [BC] Province of British Columbia. 2015. Riparian Areas Regulation. Victoria, British Columbia, Canada.
- [EEC] Ecoscape Environmental Consultants. 2016. Kootenay Lake Foreshore Inventory and Mapping and Aquatic Habitat Index. Prepared for: Kootenay Lake Partnership & Fisheries and Oceans Canada.
- Environment Canada. 2014a. Recovery Strategy for White Sturgeon (*Acipenser transmontanus*) in Canada. Environment Canada, Ottawa.
- Kipp, S. and Callaway, C. 2002. On the Living Edge. Your Handbook for Waterfront Living.
- [KLP] Ktunaxa Nation Council, Regional District of Central Kootenay, Ministry of Forests, Lands, and Natural Resource Operations, Ecoscape Environmental Consultants Ltd., Tipi Mountain Eco-Cultural Services Ltd. The Firelight Group Ltd., Wayne Choquette. 2018. Shoreline Management Guidelines – Kootenay Lake. Prepared for Kootenay Lake Partnership.
- Kootenay Lake Plant Society. Native Plants for Native Pollinators. Accessed on Nov 22, 2012. <http://kootenaynativeplants.ca/get-involved/native-plants-for-native-pollinators/>
- Mackillop, D. and Ehman, A. 2016. A Field Guide to site classification and identification for southeast: the southeast Columbia Mountains. Province of B.C., Victoria, B.C. Land Management Handbook 70.
- [MELP] BC Ministry of Environment Lands and Parks. 1996. Tree Replacement Criteria
- [MV] Metro Vancouver. N.D. A Homeowner's Guide to Stormwater Management.
- [MOA] BC Ministry of Agriculture. 2012. Riparian Factsheet No. 6 – Riparian Plant Acquisition and Planting.
- [MOE] BC Ministry of Environment. 2014. Develop with Care. Province of British Columbia. Victoria, British Columbia, Canada.
- [MOE] BC Ministry of Environment. 2015. General BMPs and Standard Project Considerations. Victoria, British Columbia, Canada.
- [MOE] BC Ministry of Environment. 2016. Provincial Water Sustainability Act. Victoria, British Columbia, Canada.
- [MOH] Health Protection Branch of the BC Ministry of Health. 2014. Sewerage System Standard Practice Manual – Version 3.

[MFLNRO] BC Ministry of Forests Lands and Natural Resource Operations. N.D. Firesmart Homeowner's Manual.

[RDCK] Regional District of Central Kootenays. 2013. Electoral Area 'E' Rural Official Community Plan Bylaw No. 2260, 2013.

**APPENDIX 1
LOCATION MAP**



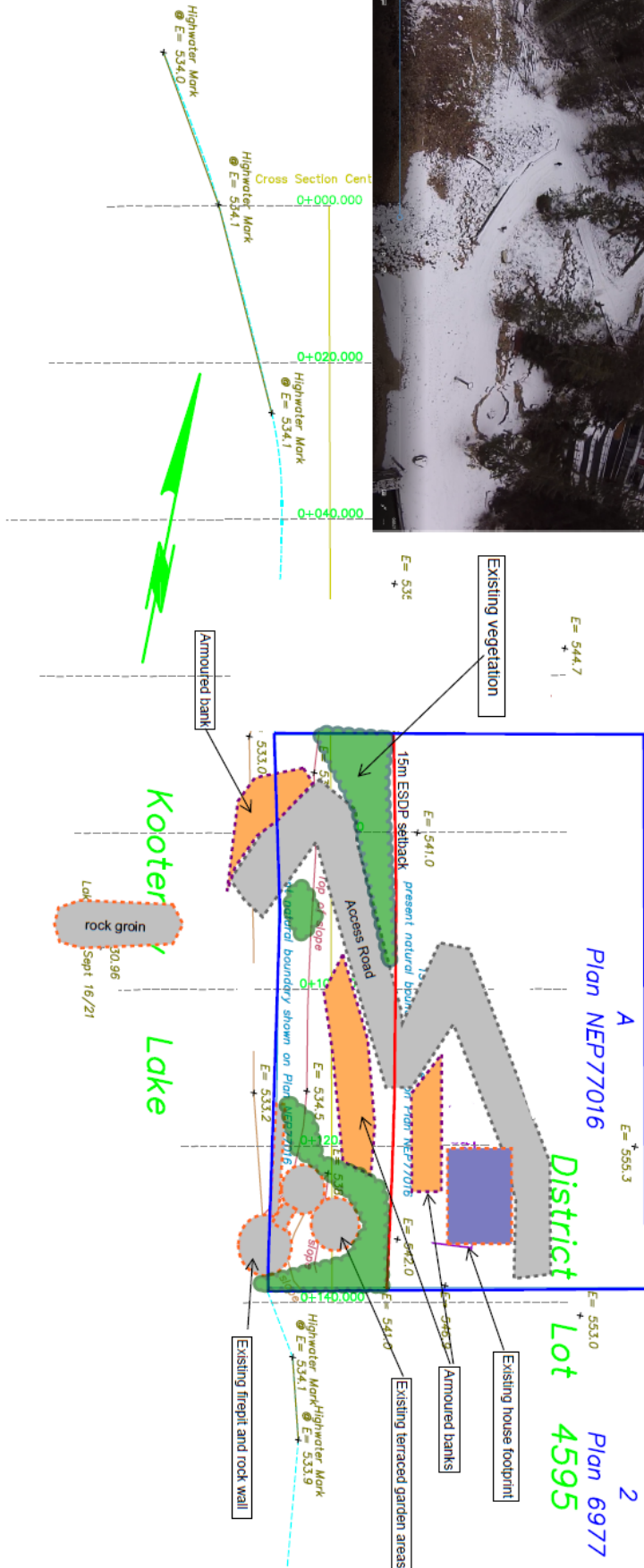
APPENDIX 2
PRE-EXISTING DEVELOPMENT SITE PLAN

Sketch of site information and cross sections of part of Lot A, Plan NEP77016, District Lot 4595, Kootenay District.

Scale 1:500

All distances are in metres unless otherwise noted.
Elevations are geodetic and in metres.

Civic Address: 13745 Highway 3A.



- Notes:**
1. Areas of pre-existing development are estimated from historical photos and aerial imagery and were not surveyed and have been overlaid on the survey

GRIFFITH SURVEYS
R. Griffith Land Surveying Inc.
Box 158 Creston, B. C., V0B 1G0
MM21027 Enviro Sketch B

The field survey represented by this plan was completed on the 16th day of September, 2021.
Robert A. Griffith, BCLS 568

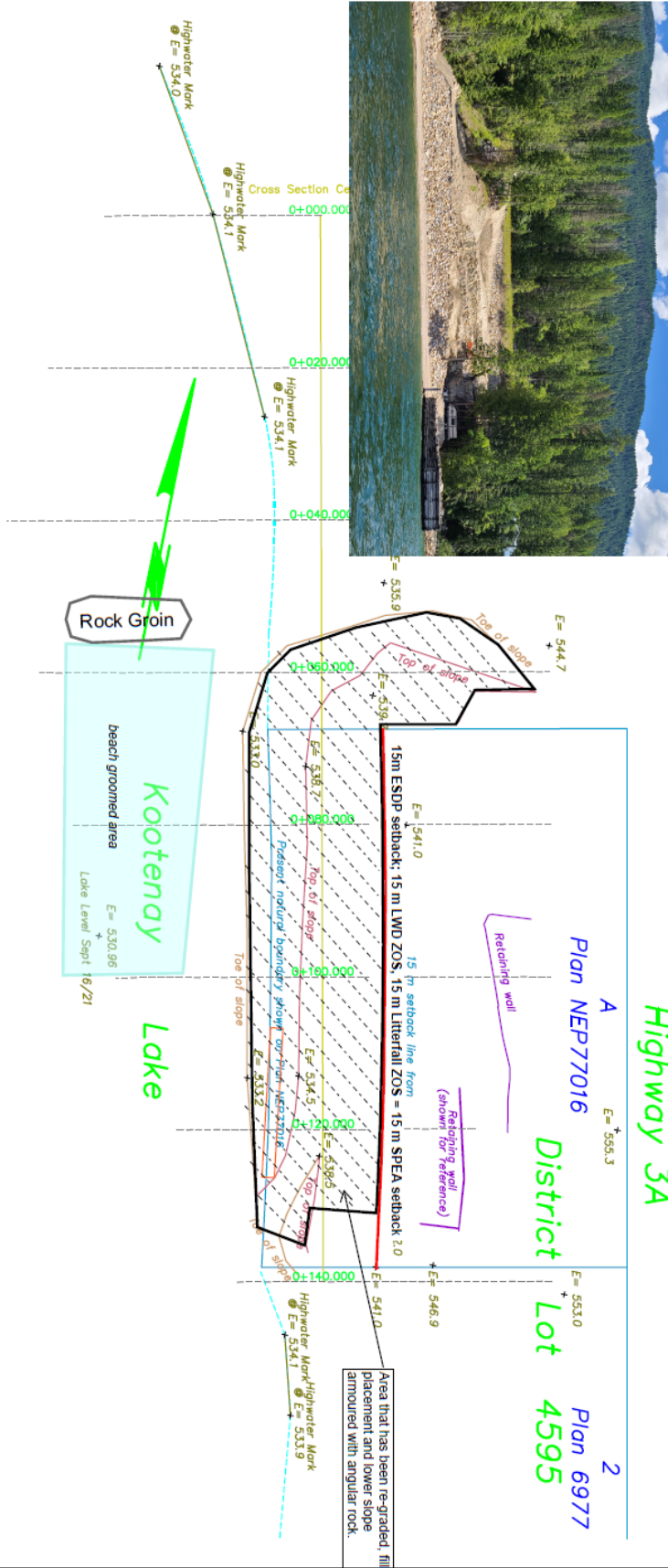
APPENDIX 3
CURRENT SITE SURVEY AND SPEA MAP

Sketch of site information and cross sections of part of Lot A, Plan NEP77016, District Lot 4595, Kootenay District.

Scale 1:500

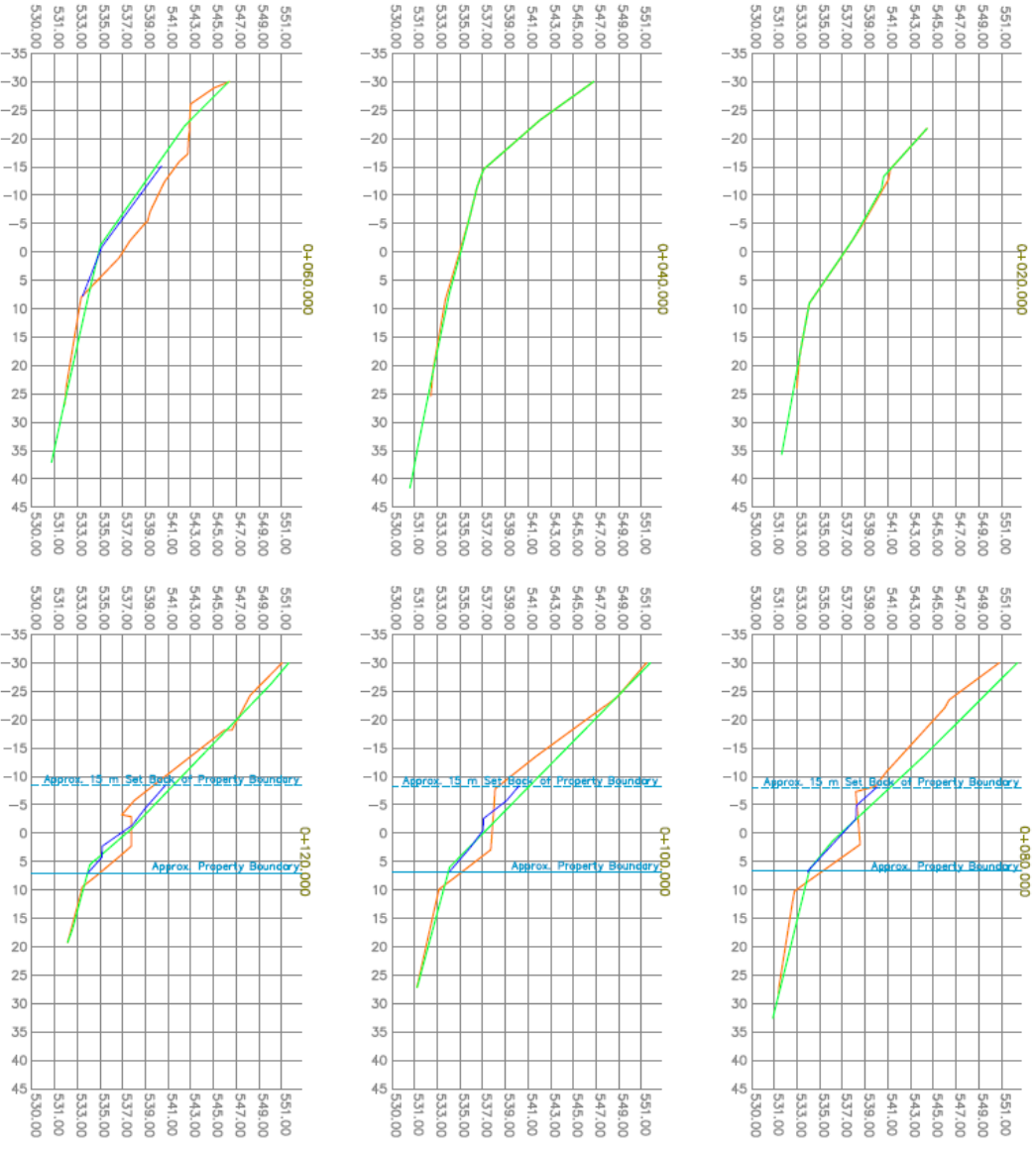
All distances are in metres unless otherwise noted. Elevations are geodetic and in metres.

Civic Address: 13745 Highway 3A.



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MM21027 Enviro Sketch B

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Robert A. Griffith, BCLS 568



Cross Sections showing surface comparison of current ground and presumed former ground at Lot A, Plan NEPT7016, District Lot 4595, Kootenay District.

Blue = Proposed ground
 Orange = Current ground
 Green = Presumed former ground

The presumed former ground was created from undisturbed ground, primarily on neighbouring lots. All distances are in metres unless otherwise noted. Elevations are geodetic and in metres.

The field survey represented by this plan was completed on the 16th day of September, 2021.
 Robert A. Griffith, BCLS 568

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 MM21027 Envisio Sketch C

**APPENDIX 4
PROPOSED SITE PLAN**

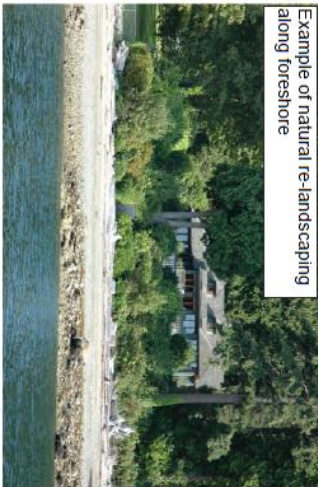
Sketch of site information and cross sections of part of Lot A, Plan NEP77016, District Lot 4595, Kootenay District.

Scale 1:500

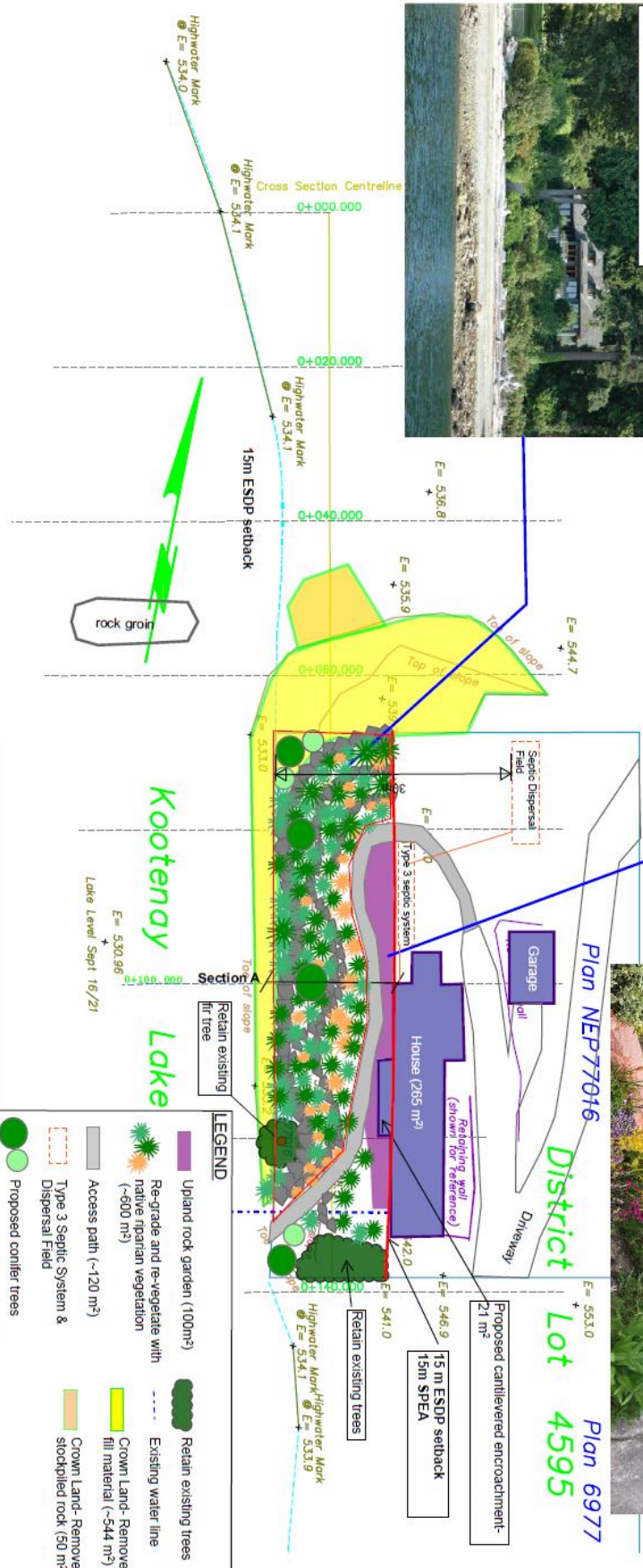
All distances are in metres unless otherwise noted. Elevations are geodetic and in metres.

Civic Address: 13745 Highway 3A.

Example of natural re-landscaping along foreshore



Example of rock garden landscaping



LEGEND

- Upland rock garden (100m²)
- Re-grade and re-vegetate with native riparian vegetation (~600 m²)
- Access path (~120 m²)
- Type 3 Septic System & Dispersal Field
- Proposed conifer trees
- Small rock walls < 4' high
- Retain existing trees
- Existing water line
- Crown Land- Remove fill material (~544 m²)
- Crown Land- Remove stockpiled rock (50 m²)

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13745 Hwy 3A, Boswell BC
 Proposed Site Plan
 Drawn by: F.L
 Date: Jan 31, 2022



The field survey represented by this plan was completed on the 16th day of September, 2021.
 Robert A. Griffith, BCLS 568

