REGIONAL DISTRICT OF CENTRAL KOOTENAY

DEVELOPMENT PERMIT

DP1905D (CLAPP AND ATWELL)

Date: July 25, 2019

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

1. This Development Permit is issued to Tara Lynn Clapp and John Atwell of 5560 Highway 31, Mirror Lake, as the registered owner (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 B District Lot 819 Kootenay Land District Plan NEP60877 (PID 024-013-234) as shown on the attached Schedules 1 and 2, 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. The said lands have been designated 'Country Residential' and are located within a Development Permit Area pursuant to the Electoral Area D Comprehensive Land Use Bylaw No. 2622 as amended.

4. The Permittee has applied to the Regional District of Central Kootenay to construct an addition to a mobile home and free standing deck and to use land and buildings situated on the said lands for this purpose.

5. 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 4 of this Development Permit.

6. 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.

7. The Permittee shall be required to undertake the following measures to protect the integrity of the SPEA:

    a. Schedule environmentally sensitive activities, including the removal of trees and work within the riparian area, within the least risk work window for nesting birds (August 1 to March 31) and raptors (August 15 to January 30).

    b. Keep clearing of vegetation kept to the minimum required for access, staging, construction works and safety considerations.

    c. Ensure sediment and erosion control by limiting soil disturbance and compaction and controlling storm water run off.

    d. Stockpiles of soil must be kept at a minimum of 30 metres from the foreshore of Kootenay Lake.

e. Construction waste generated on site must be disposed of off site and washing of equipment must be conducted at a minimum of 30 metres from the foreshore of Kootenay Lake.

f. Replacement of trees removed for the purposes of the proposed development shall include installation of new riparian planting consisting of twenty (20) trees and/or shrubs at a minimum of 3.0 metres spacing. Conifers shall be planted at a minimum of 10.0 metres from any structure for reduced fire risk.

g. Replacement of vegetation removed for the purposes of the proposed development shall include up to ninety (90) riparian shrubs and plants as recommended. Shrubs associated with the supplemental landscape planting shall be a minimum density of 1 plant per square metre.

h. Arrangements will be made with the Ktunaxa Nation to enable access to the three (3) white pine removed as part of the development proposal.

i. All supplemental landscape planting shall be installed and inspected by Regional District of Central Kootenay staff prior to July 20, 2020.

8. As a condition of the issuance of this Permit, the Regional District shall hold Security submitted by the Permittee in the amount of $2880.00 to ensure the supplemental landscaping requirements as set forth in Section 7 are completed and in accordance with the following provisions:

a. A condition of the posting of the Security 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 Security to complete the required works or services by 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.

b. The Permittee shall complete the supplemental landscaping required by this Permit prior to July 20, 2020. Within this time period the required plantings must be inspected and approved by the Regional District.

c. If the riparian plantings are not approved within this time period, the Regional District has the option of continuing to hold the Security until the required works have been completed or has the option of drawing from the Security to complete the required works. In this event, the Regional District or its agents have the irrevocable right to enter into the property to undertake the required works for which the Security was submitted.

d. If the required works are completed and approved within this time period without the Regional District having to draw the on the Security, 40% of the original amount of the Security shall be returned to the Permittee.

e. A 40% portion of the Security shall be retained until a subsequent inspection is undertaken within 12 months of the date of the original inspection and the remaining hold back of 20% shall be retained following a final inspection to be held 24 months from the date of the original inspection. If after the final inspection, approval of the works is not given, the Regional District has the option of continuing to renew the Security until the required works are approved or has the option of drawing on the Security to complete the required works. In this event, the Regional District or its agents

have the irrevocable right to enter onto the property to undertake the required works for which the Security 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.

Sangita Sudan, General Manager of Development Services

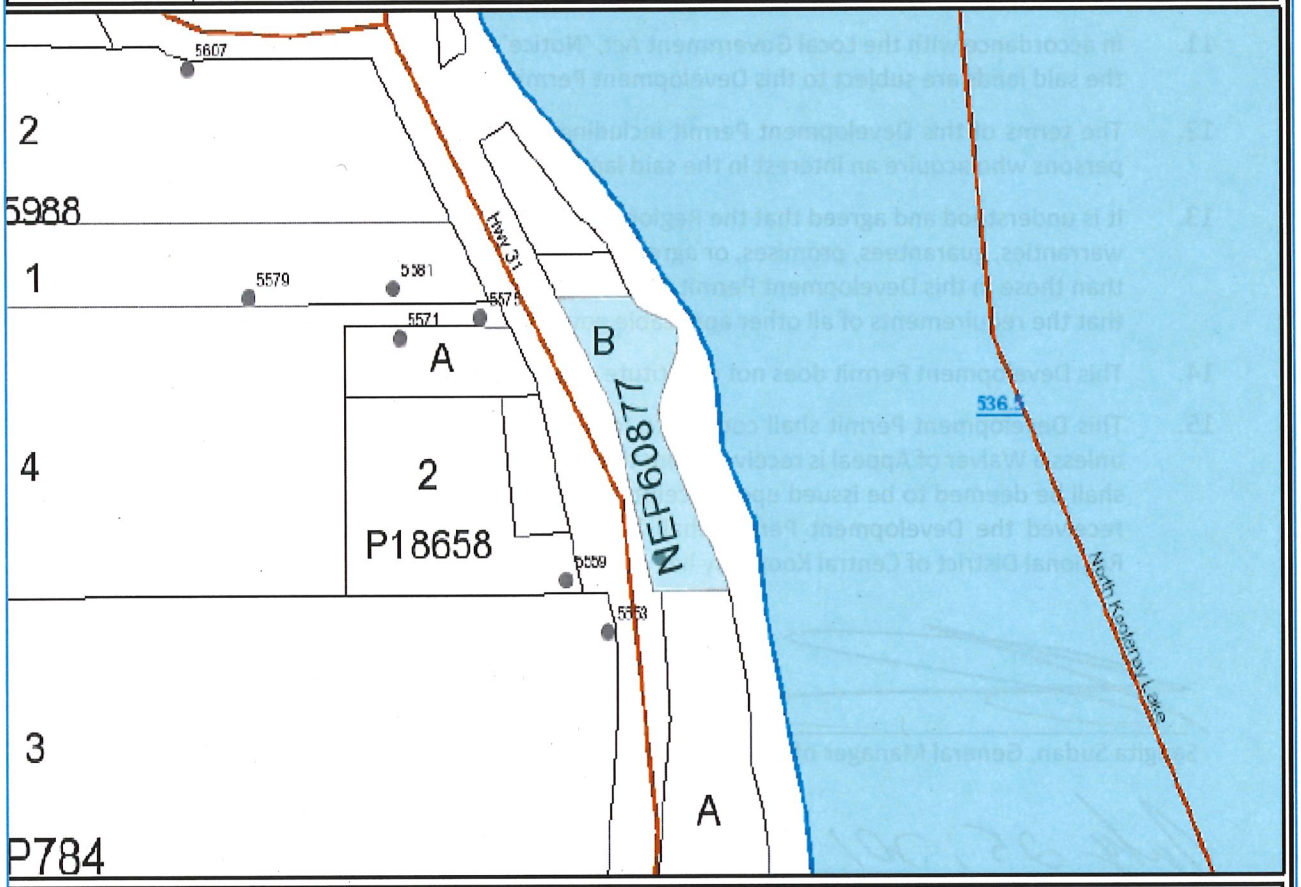
July 25, 2019.
Date of Approval (date of review and approval)

Date of Issuance (pending receipt of securities)

Schedule 1: Subject Property

Property Information Report

Folio Number:	786.03079.095	EA: D
Site Address:	5560 HIGHWAY 31	
PID:	024-013-234	Parcel area: .8 ACRES
Legal Description:	LOT B, PLAN NEP60877, DISTRICT LOT 819, KOOTENAY LAND DISTRICT, MANUFACTURED HOME REG.# 81784	



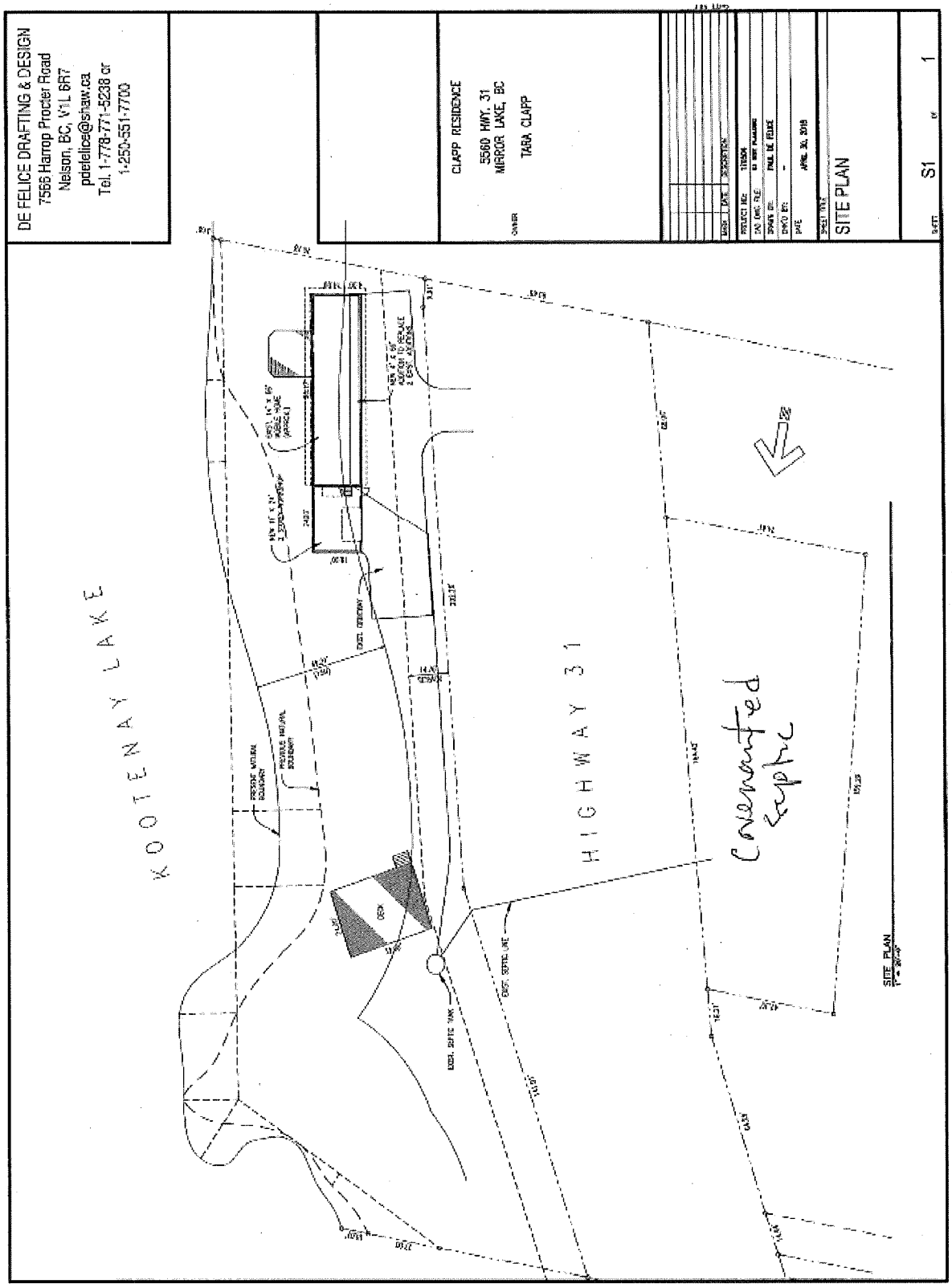
Land-use Information

Zoning Designation:	UNZONED		

General Services Information

		Fire Department:	KASLO

Schedule 2: Site Plan



Schedule 3: Riparian Assessment

SEE ATTACHED REPORT

MASSE ENVIRONMENTAL
CONSULTANTS LTD.

5560 HIGHWAY 31
KASLO, 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

May 2018

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1 INTRODUCTION

Masse Environmental Consultants Ltd. (MEC) was retained by Tara Clapp, owner of 5560 Highway 31, Kaslo, BC to provide environmental consulting services in support of the proposed development of a house within the Waterfront Development Permit (WDP) area.

A site visit was conducted on August 28, 2017 by Sylvie Masse MSc, RPBio; and Iraleigh Anderson Environmental Technician, to assess the habitat values of the site, and the potential impacts of the proposed development on riparian and foreshore areas. An additional site visit was completed by Iraleigh Anderson on May 17, 2018 to reassess the site with consideration of amendments to the site plan.

This assessment will evaluate the existing conditions of the foreshore and riparian areas, identify important habitat values, record the existing environmental impacts, and recommend measures to protect environmentally sensitive areas for future development. It is based on the following regulatory framework and best management practices documents:

- Electoral Area 'D' Comprehensive Land Use Bylaw No. 2435, 2016
- British Columbia Riparian Areas Regulation
- Provincial Water Sustainability Act
- 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
- BC Tree Replacement Criteria
- Kootenay Lake Partnership Shoreline Management Guidelines
- Foreshore Inventory, Mapping and Aquatic Habitat Index – Kootenay Lake

This report has been prepared by Iraleigh Anderson Env. Tech., and reviewed by Sylvie Masse, MSc, RPBio.

I, Sylvie Masse, hereby certify that:

a) I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the Fish Protection Act;
b) I am qualified to carry out this part of the assessment of the development proposal made by the developer;
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 assessment methods set out in the Schedule to the Riparian Areas Regulation.

1.1 Location

The subject property, 5560 Highway 31, is located approximately 3.5 km south of the community of Kaslo, BC (Appendix 1). The property is bordered by private properties to the north and south, and Kootenay Lake to the east. The property straddles highway 31, with buildings and living space on the east portion, while the portion of the property on the west side of the highway is limited to use for septic treatment by a covenant held by Interior Health (see Site Survey Appendix 2, and Site Plan and Setback Map Appendix 3).

The project area is within the Interior Cedar Hemlock dry warm variant 1 (ICHdw1) biogeoclimatic subzone. 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. Snow packs are very shallow to shallow and of short duration and combined with the mild climate result in no significant soil freezing.

1.2 Streamside Protection and Enhancement Area (SPEA)

During our site visit, the visible high water mark (HWM) was located at ~533.5 elevation, approximately the natural boundary line as shown on the attached site plan (Appendix 2; Photos 1 & 2). The HWM was based on the location of presence of terrestrial vegetation along the foreshore (see definition of Natural Boundary below). The riparian setbacks will be measured from the surveyed natural boundary ("Present Natural Boundary" in Site Plan Appendix 2).

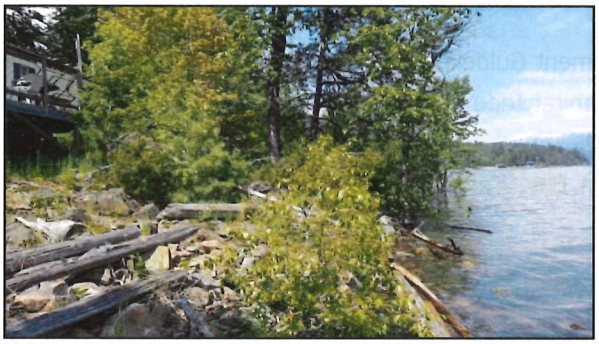

Photo 1. Kootenay Lake water level approximately at high water mark below mobile home May 12, 2018.

Photo 2. Kootenay Lake water level approximately at high water mark below road between upper and lower part of property May 12, 2018.

> "**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);

To determine whether the WDP area of 30 meters from high water mark of the lake aligns with the criteria in the Riparian Area Regulation (RAR), a detailed assessment of the site was conducted to calculate the Streamside Protection and Enhancement Area (SPEA) for Kootenay Lake on the proposed site. Results for the Zones of Sensitivity (ZOS) and SPEA are presented in Table 1 below and on the setback map (Appendix 3).

As per the RAR, the large woody debris (LWD), and litter ZOS were plotted 15 m inland from the HWM, while the shade ZOS was plotted at 30 m due south from the HWM. The SPEA is determined based on the ZOS with the greatest width. The property boundary along the foreshore generally faces east with a section at the north end that faces north. The SPEA was based on the 15 m LWD/litter ZOS on the south part of the property where the shoreline is facing east. On the north end of the property where the shore is primarily facing north, the SPEA is based on the 30 m shade ZOS.

Table 1. SPEA result of detailed assessment.

Feature Type	SPVT[1]	Zones of Sensitivity			SPEA[3]
		LWD[2]	Litter fall	Shade	
Lake	TR	15 m	15 m	0 m – east facing shore 30 m – north facing shore	**15 m – east facing shore** **30 m – north facing shore**

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

2 PROJECT OVERVIEW

2.1 Existing Development

Existing development of the property consists of an 85 m^2 mobile home (4.26 x 20.12 m) on the upper part of the property, and a small road which runs down to a cleared landing with two small trailers serving as guest lodging and extra living space. Most of the subject property and all existing development on site are located within the 30 meter WDP.

2.2 Proposed Development

The proposed development consists of the addition of a two-story workshop on the north end of the existing mobile home, an addition of living space along the west side of the mobile home, and a new deck down the road from the mobile home on the cleared landing (Appendix 3). Both of the additions and the deck fall partially within the 30 m WDP and the SPEA. The proposed workshop will be attached to the north end of the trailer and will encompass a footprint of 40.13 m^2 (4.27 x 20.12 m; Photos 3 & 4). The second proposed addition will provide an additional 24.53 m^2 of living space along the west side of

the trailer by extending the west side of the trailer by 1.22 m along its entire length (20.12 m; along west face of trailer visible in Photo 5). The proposed deck will be unattached to any existing structure and will be set in to the ground on concrete footings in the cleared lower landing (Photo 6). The footprint of the deck will be 71.35 m^2 (7.32 x 9.75 m). Although the building is proposed above the floodplain construction level (536.5 m), and the deck is exempt from the floodplain construction level, both structures are within the 15 m floodplain setback and will require a floodplain exemption application to the RDCK.

Photo 3. Footprint for proposed work shop at north end of mobile home.

Photo 4. View east to proposed workshop footprint. Note the trees in the left corner which will be removed.

Photo 5. West side of existing mobile home where 1.22 m wide addition will run.

Photo 6. Guest trailer and road from mobile home to proposed building site for deck.

2.3 Services and Site Drainage

The mobile home receives water from the Mirror Lake Community Water System. However, the property owners are applying for a license to draw water directly from Kootenay Lake. When this license is approved, the home owners will no longer draw water from the Mirror Lake Community Water System,

and will instead draw all of their water from Kootenay Lake. The water intake will run from Kootenay Lake into the existing mobile home near the center point of the east wall.

Sewage disposal for the mobile home is serviced by a septic disposal field located on the portion of the subject property on the west side of Highway 31, outside the WDP area. There were no drainage issues observed within the riparian areas of the proposed development. See site drawings in Appendix 3 for location of septic system.

3 RESOURCES

3.1 Fish and Fish Habitat

Typically, Kootenay Lake experiences two seasonal water level increases annually. The first increase is observed in April during low elevation snowmelt followed by a more substantial secondary rise in water levels due to high elevation snowmelt in June. Lake levels can vary by up to 4 m throughout the year affecting the extent of exposed shoreline.

The foreshore consists of a rocky shoreline with exposed bedrock and angular boulders and cobble, with some discrete areas with up to 30% gravel (Photos 7 - 10). The south section of the property below the mobile home is moderately sloped with ~15% gradient at the shoreline, and ~28% gradient on the bedrock above the shoreline. The shoreline below the proposed building site for the deck has a ~12% slope, which ends at the base of the 1.5 meter high bench below the building site. The rocky shoreline provides potential rearing and cover habitat for juvenile and adult fish. No aquatic vegetation was observed within the shoreline along this property. The section of foreshore next to the project area was assigned a moderate fisheries habitat index rating (Ecoscape 2016), and presence of emergent vegetation, however no emergent vegetation was observed during the August site visit during lower water levels. A further site visit conducted on May 12, 2018 during high water lake levels showed flooding of the vegetation on the foreshore (Photo 2).

Kootenay Lake supports a variety of fish species (Table 2), 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. clarki lewisi*), and burbot (*Lota lota*).

Table 2. Fish species present in Kootenay Lake.

Species	Scientific Name	Comments
Burbot	*Lota lota*	Kootenay Lake population is red listed
Bull Trout	*Salvelinus confluentus*	Blue-listed species
Brook Trout	*Salvelinus fontinalis*	Introduced species
Kokanee	*Oncorhynchus nerka*	
Largemouth Bass	*Micropterus salmoides*	Introduced species
Largescale Sucker	*Catostomus macrocheilus*	
Longnose Dace	*Rhinichthys cataractae*	
Longnose Sucker	*Catostomus catostomus*	
Lake Whitefish	*Coregonus clupeaformis*	
Mountain Whitefish	*Prosopium williamsoni*	
Northern Pikeminnow	*Ptychocheilus oregonensis*	
Peamouth Chub	*Mylocheilus caurinus*	
Pumpkinseed	*Lepomis gibbosus*	Introduced species
Prickly Sculpin	*Cottus asper*	
Pygmy Whitefish	*Prosopium coulteri*	
Rainbow Trout	*Oncorhynchus mykiss*	
Redside Shiner	*Richardsonius balteatus*	
Slimy Sculpin	*Cottus cognatus*	
Torrent Sculpin	*Cottus rhotheus*	
Westslope Cutthroat Trout	*Oncorhynchus clarki lewisi*	Blue-listed species
White Sturgeon	*Acipenser transmontanus*	Kootenay Lake population is red-listed
Yellow Perch	*Perca flavescens*	Introduced species

(Habitat Wizard 2017)

Photo 7. Shoreline at north end of property with rocky outcrop.

Photo 8. Shoreline at south end of property.

Photo 9. Shoreline substrate east of proposed building site.

Photo 10. Area of gravel among boulders southeast of building site.

3.2 Riparian Vegetation

The riparian area along the lake mostly has an eastern aspect, with some exposed bedrock at the north end of the property.

The rocky shoreline has multiple patches of young trees and shrubs, with an understory of forbs, sedges, and grasses (Photo 11). The angular boulders of the shoreline are littered with coarse woody debris from a range of size classes up to ~50 cm in diameter. The section of the property north of the proposed development is covered in a young forest with a canopy of western white pine (*Pinus monticola*), interior Douglas fir (*Pseudotsuga menziesii*), and many European mountain ash (*Sorbus aucuparia*) saplings growing in the understory (Photo 12). White pine snags, and the stumps of large cottonwoods (*Populus trichocarpa*) are present throughout this area. The average estimated height of this stand is ~18 meters. Other un-cleared areas of the property support younger forest dominated by white pine, and lacking the development of understory vegetation.

The building site for the workshop is bordered by a small patch of young forest, which includes white pine, and Douglas fir with DBH generally less than 25 cm, and height ~15 m.

The building site for the deck is a cleared bench dominated by agronomic grasses and introduced broadleaf weeds including common tansy and hoary alyssum. Common tansy (*Tanacetum vulgare*) is a regionally regulated noxious weed species within the Regional District of Central Kootenay, while hoary alyssum (*Berteroa incana*) is a regionally regulated noxious species within the neighboring Regional District of Kootenay Boundary.

A list of plant species encountered within the 30 meter WDP area on site is presented in Table 3.

Table 3. Plant species list from 30 m WDP area at 5560 Highway 31, August 28, 2017.

Common Name	Latin Name	Common Name	Latin Name
Trees		**Shrubs (cont'd)**	
western white pine	*Pinus monticola*	thimbleberry	*Rubus parviflorus*
lodgepole pine	*Pinus contorta*	prairie rose	*Rosa woodsii*
western larch	*Larix occidentalis*	shrubby cinquefoil	*Dasiphora fruticosa*
Douglas maple	*Acer glabrum*	**Herbaceous**	
European mountain-ash	*Sorbus aucuparia*	self-heal	*Prunella vulgaris*
trembling aspen	*Populus tremuloides*	night-flowering catchfly	*Silene noctiflora*
black cottonwood	*Populus trichocarpa*	chicory	*Cichorium intybus*
interior Douglas fir	*Pseudotsuga menziesii*	ribwort plantain	*Plantago lanceolata*
paper birch	*Betula papyrifera*	hoary alyssum*	*Berteroa incana*
apple	*Malus sp.*	western mugwort	*Artemisia ludoviciana var. incompta*
Shrubs		common dandelion	*Taraxacum officinale*
choke cherry	*Prunus virginiana*	common tansy*	*Tanacetum vulgare*
mountain alder	*Alnus incana*	mountain sneezeweed	*Helenium autumnale var. montanum*
tall Oregon-grape	*Mahonia aquifolium*	common horsetail	*Equisetum arvense*
black hawthorn	*Crataegus douglasii*	orchard-grass	*Dactylis glomerata*
red-osier dogwood	*Cornus stolonifera*	white sweet-clover	*Melilotus alba*
saskatoon	*Amelanchier alnifolia*	aster	*Aster sp.*
soopolallie	*Shepherdia canadensis*	sedge	*Carex sp.*
common snowberry	*Symphoricarpos albus*	grasses	*Poaceae sp.*

* denotes regionally noxious weed species

Photo 11. Rocky shoreline area below proposed building areas with patches of young trees and shrubs.

Photo 12. White pine dominated forest at north end of property.

3.3 Wildlife

3.3.1 Reptiles and Amphibians

The rocky outcrops, boulders and large woody debris along the foreshore provide good habitat for reptiles, though none were observed during the survey.

3.3.2 Birds

Several small snags (<30 cm DBH) were noted in the forested area at the north end of the propert that could be of used by cavity nesting bird species. A quick assessment was conducted to identify raptor nests and none were found, though mature conifer trees within the riparian area are conducive for perching and nesting for raptors.

3.3.3 Mammals

The riparian area has some suitable habitat for mammals with palatable vegetation including grasses and young saplings. Ungulates may occasionally use the area to access the water and browse on vegetation, however no signs of droppings or browse were observed. Multiple signs of black bear (*Ursus americanus*), including scat, and browse of white sweet clover (*Melilotus alba*) were observed.

3.4 Species at Risk

A species at risk inventory search was conducted using Habitat Wizard on iMap to identify any known occurrences within or near the project area (Table 4). There was no sign, or occurrence of any of these species encountered during the site survey.

Table 4. Species at risk.

Common Name	Latin Name	Comments
White sturgeon- Kootenay River Population	Acipenser transmontanus	Red listed Kootenay lake population.
Painted turtle	Chrysemys picta	Blue listed Intermoutain-Rocky Mountain Population. Recorded in Mirror Lake 1 km away. Does not occur in Kootenay Lake.
Wild licorice	Glycyrrhiza lepidota	Blue listed. Recorded at Mirror Lake 1 km away.

(CDC 2017)

4 Environmental Considerations

4.1 Impacts to the SPEA

The proposed development will involve the following activities within the 30 meter WDP area:

- Addition of a two-story workshop on the north side of the mobile home;
- An addition of living space along the west side of the mobile home;
- A new deck down the road from the mobile home on the cleared landing; and
- Removal of 8 living trees, and 3 snags within the SPEA, next to the workshop footprint,

Approximately 30 m^2 of the proposed workshop, and ~60 m^2 of the proposed deck will encroach within the SPEA. Presently, most of the proposed footprint for the workshop north of the mobile home is occupied by a woodshed and general storage area, and is not functioning as riparian habitat. However, eight small live trees, and three small dead trees would have to be removed from the northeast corner of the workshop footprint to facilitate construction. A summary of trees to be removed is provided in Table 5.

Table 5. Proposed trees for removal within the SPEA.

Species	Number of Stems	DBH (cm)
Hawthorn	2	12, & 5
White pine (dead)	3	15, 13, & 10
Lodgepole pine	3	15, 8, & 8
Douglas fir	3	18, 15, & 15

Because these trees are within the SPEA, they are considered to be valued elements of the aquatic habitat in Kootenay Lake. Trees within the SPEA contribute to a healthy and productive aquatic ecosystem through the provision of functions including: large woody debris recruitment, insect drop, buffering of terrestrial pollution from roads, and erosion control. As such, the cumulative removal of trees and other vegetation within the SPEA has an impact on the health of aquatic ecosystems in Kootenay Lake. To mitigate for the loss of trees within the SPEA, we recommend that the trees be replaced as per the BC Tree Replacement Criteria (MoE 1996). Refer to Section 6 for a proposed Mitigation Plan.

Though most of the deck footprint is within the SPEA (Appendix 3), this area is not presently forested, or utilized as wildlife habitat. At present, the proposed deck footprint is dominated by agronomic grasses, and other non-native plants, including two regionally noxious species. The development of this land will not result in the loss of current riparian ecosystem function, however potential reestablishment of riparian forest will be prevented by the development of a deck in this area.

The construction of the deck will require the removal of additional trees. Though these trees do not fall within the SPEA, they are within the 30 meter WDP area. One western white pine (32 cm DBH), and one paper birch (35 cm DBH) will require removal. A small paper birch snag (<15 cm DBH) will be removed from this area also.

The addition on the west side of the mobile home is outside of the SPEA. Development in this area will only require the removal of ornamental vegetation, and not native forest.

4.2 Aquatic Impacts

Aside from the loss of riparian vegetation within the SPEA, described in section 4.1 above, there are no direct aquatic impacts foreseen from the proposed development on site.

5 MEASURES TO PROTECT THE INTEGRITY OF SPEA

Proposed development activities on the building site should not pose a threat to the ecological integrity of adjacent areas of the SPEA, provided environmental best management practices outlined in this section are followed during construction activities.

An assessment was conducted to determine the potential for hazards within the SPEA, including windthrow, slope stability, and hazard trees. General environmental procedures recommended to protect the integrity of the SPEA include appropriate scheduling of environmentally sensitive activities, protection of trees and vegetation in the SPEA during construction, sediment and erosion control, construction waste management, and invasive plant management.

5.1 Windthrow

A Registered Professional Forester (RPF) was not retained to assess potential windthrow. Clearing activities are limited and are not expected to increase the risk of windthrow on the property.

5.2 Slope Stability

The owners have piled logs along the upper foreshore area to protect the upland areas of the site from erosion during high water events (Photo 2 and 13). Signs of active erosion were not visible in this area, and no other slope stability indicators were observed by the QEP (as per Table 3.8 of the RAR, BC 2015). However, this does not confirm the absence of terrain stability issues as a geotechnical assessment was not completed by a P.Geo. or P.Eng.

Photo 13. Large woody debris placed against the bank for erosion protection

5.3 Hazard Trees

A RPF was not retained to assess hazard trees; however, a quick assessment for potential hazard trees was conducted by the QEP within the property. Three standing dead white pines within the 30 meter

WDP area were observed below the access road between the mobile home and the proposed site of the deck, these trees may be considered a hazard to humans and property due to their proximity to the access road and other relatively busy areas of the site.

Another standing dead tree was noted just behind the southwest corner of the proposed deck. The Douglas fir next to this tree will be removed during construction, so this tree may need to be removed at this time also.

The property owners have noted that the western white pines on site are dying on a regular basis from disease; likely white-pine blister rust (*Cronatrium ribicola*). Therefore, it is likely that standing dead trees will continue to be a hazard on this site. It is recommended that any trees that are felled in forested areas within the 30 meter WDP area be left in place on the ground to enhance wildlife habitat. Further wildlife habitat enhancement could be achieved by the selective retention of western white pine stumps. As western white pines larger than 30 cm in diameter are removed, stumps of 3-5 m should be left standing to provide habitat for cavity nesting birds and mammals. Less disease prone native conifer species should be used to replace the western white pines as they continue to die off.

5.4 Scheduling of Environmentally Sensitive Activities

Environmentally sensitive activities include the removal of several trees and work within the riparian area. In order to avoid potential wildlife impacts, any tree clearing for this project should occur within the least risk work window period for nesting birds (August 1- March 31) and raptors (August 15-January 30). If removal of vegetation is scheduled otherwise, a nesting bird survey is recommended prior to vegetation clearing.

5.5 Protection of Trees and Vegetation in the SPEA

Clearing of vegetation will be kept to the minimum possible area required for access, staging, construction works, and safety considerations. The property owners will discuss vegetation removal with all contractors, and ensure that no trees, beyond those identified in this report, are removed during construction.

5.6 Sediment and Erosion Control

The excavation of footings for the proposed dwelling carries the risk of erosion and sediment releases into Kootenay Lake. The following mitigation measures will be implemented to reduce the risk of sediment input to the Kootenay Lake:

- Amount of soil disturbance and soil compaction will be kept to a minimum.
- Stormwater runoff, if present, will be controlled and redirected away from exposed soils.
- Stockpiles of soil will be located at least 30 m from Kootenay Lake and covered with tarps to prevent erosion and establishment of invasive weeds if they are left for greater than two months.

5.7 Construction Waste Management

All construction waste generated on site must be taken off site and re-used, recycled or disposed of accordingly. Construction personnel should be instructed to ensure the site is kept clean and to prevent litter from escaping the site. Concrete will likely be used in the construction of the house foundation. Fresh concrete and concrete laden water is caustic and toxic to aquatic organisms. The following precautions should be taken when handling concrete to ensure the protection of Kootenay Lake:

- Concrete waste should be collected and disposed of at an approved disposal site.
- Washing of equipment used during concrete work should occur at a designated location at least 30 m away from Kootenay Lake where wash water will not drain directly into the lake.

5.8 Invasive Plant Management

Construction activities can potentially increase dispersal of invasive plant species which can out-compete native riparian vegetation, causing damage to habitat and ecosystem function. Invasive species observed onsite include common tansy and hoary alyssum. The following mitigation measures are recommended in order 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 vegetation clearing and soil disturbance should be minimized.
- All exposed soils should be re-seeded as soon as possible following completion of the project.
- After construction property owners should monitor areas of disturbed soils for the establishment of invasive plant species. New and known species of invasive plants found colonizing disturbed areas should be removed by hand, and disposed of.
- Further information regarding management of invasive species by homeowners is available through the Central Kootenay Invasive Species Society (https://ckiss.ca/).

6 Mitigation Plan

The following measures must be taken to mitigate for the removal of eight live trees (8 – 18 cm DBH) within the SPEA, and for the loss of approximately 90 m^2 of potential riparian habitat within the SPEA which will be replaced by parts of the proposed deck and workshop.

To mitigate for trees which will be removed from the SPEA the property owners must re-plant native trees within other disturbed areas of the SPEA where development is not proposed. As per the BC tree

replacement criteria (MOE 1996), it is recommended that 20 trees be re-planted at the owners discretion throughout the non-forested area within the SPEA northeast of the proposed deck footprint.

Table 6 provides a list of recommended tree species. It is recommended that the owners choose the species composition, and spacing with consideration of fire risk, and follow best practices outlined in the BC FireSmart Homeowner's Manual (FireSmart 2015). It is recommended that trees be planted at minimum 3 m spacing, and that a buffer of at least 10 m be maintained between any structure and any new coniferous trees. Planting should be completed in the spring or fall to ensure best survival rates. Additional soil amendments, including compost, mycorrhizal inoculant, and fertilizer are recommended during planting. Bark mulch placement around each of the planted stock will help the soil retain moisture, reduce competition from weeds and minimize watering requirements.

Table 6. Recommended tree species.

Species	Scientific Name	Pot Size
interior Douglas fir	*Pseudotsuga menziesii*	1 Gallon
paper birch	*Betula papiryfera*	1 Gallon
western larch	*Larix occidentalis*	1 Gallon
western red cedar	*Thuja plicata*	1 Gallon
Douglas maple	*Acer glabrum*	1 Gallon
black cottonwood	*Populus trichocarpa*	1 Gallon
mountain ash	*Sorbus sitchensis*	1 Gallon

To mitigate for the loss of ~90 m^2 of potential riparian habitat, the property owners must replant native riparian shrubs throughout the area of the SPEA northeast and east of the proposed deck where native vegetation has previously been removed. Ninety native shrub should be planted throughout this area at the owners discretion. A planting density of ~1 plant/m^2 is recommended.

Table 7. Recommended shrub species.

Species	Scientific Name	Pot Size
chokecherry	*Prunus virginiana*	Plug or 4"
bebb's willow	*Salix bebbiana*	Plug or 4"
saskatoon	*Amelanchier alnifolia*	Plug or 4"
buffaloberry	*Sheperdia canadensis*	Plug or 4"
red-osier dogwood	*Cornus stolonifera*	Plug or 4"
Oregon grape	*Mahonia aquifolium*	Plug or 4"
mountain alder	*alnus incana*	Plug or 4"

6.1 Acquiring Native Plant Stock

Nurseries located as close to the planting site as possible are recommended to ensure that selected stock are adapted to regional growing conditions. Species composition and sizing may be subject to minor changes from what is proposed in this plan. Careful transportation to the site is critical to plant survival.

Availability of species may vary between nurseries, so it is best to phone around before you finalize an order.

7 CONCLUSION

The removal of eight live trees and three snags to allow proposed development within the SPEA will result in an impact on terrestrial ecological functions which support fish habitat in Kootenay Lake. Likewise, development within un-treed areas in the SPEA will result in the permanent conversion of lands which may have otherwise potentially provided these same ecological functions. The configuration of natural and surveyed boundaries on the subject lot make it nearly impossible for further development to occur without encroachment into the SPEA, therefore, mitigation for the loss of riparian function must be provided. The impacts resulting from the relatively modest proposed development on this property can be sufficiently mitigated if the prescriptions from this mitigation plan are fully implemented, and recommended plantings are allowed to establish and mature into a meaningful area of native trees and shrubs within the riparian area on Kootenay Lake.

8 CLOSURE

I, Sylvie Masse, 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.

Prepared by:

Iraleigh Anderson, Env. Tech.

Reviewed by:

Sylvie Masse, M.Sc., R.P.Bio.
College of Applied Biology: R.P.Bio. #834

9 REFERENCES

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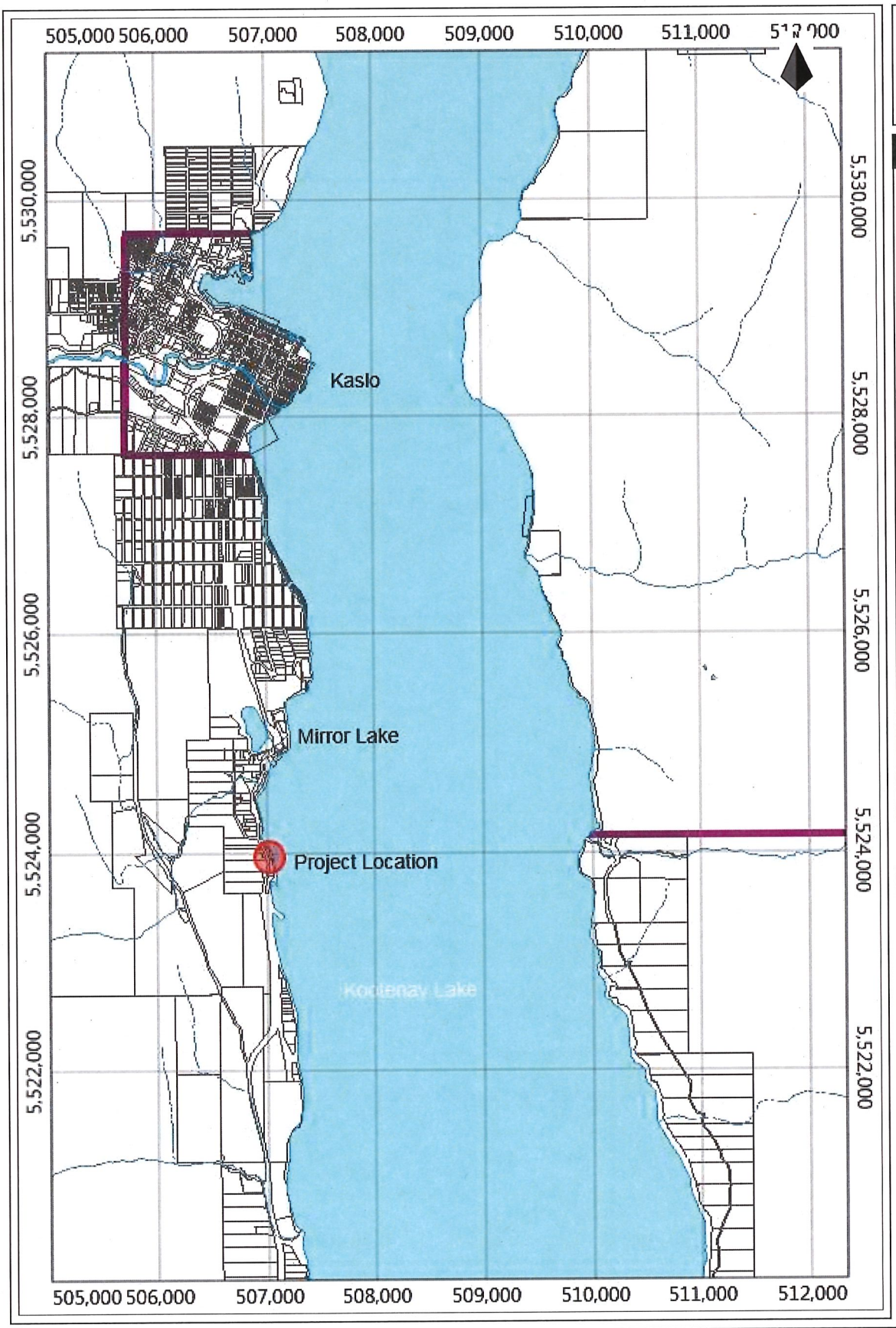
APPENDIX 1
LOCATION MAP



5560 Highway 31

Legend

- Streams
- Cadastre / Property Li
- Lakes (Mid Scale)
- Electoral Boundaries (

Notes

5560 Highway 31
Kaslo, BC

Date Plotted: 9/20/2017

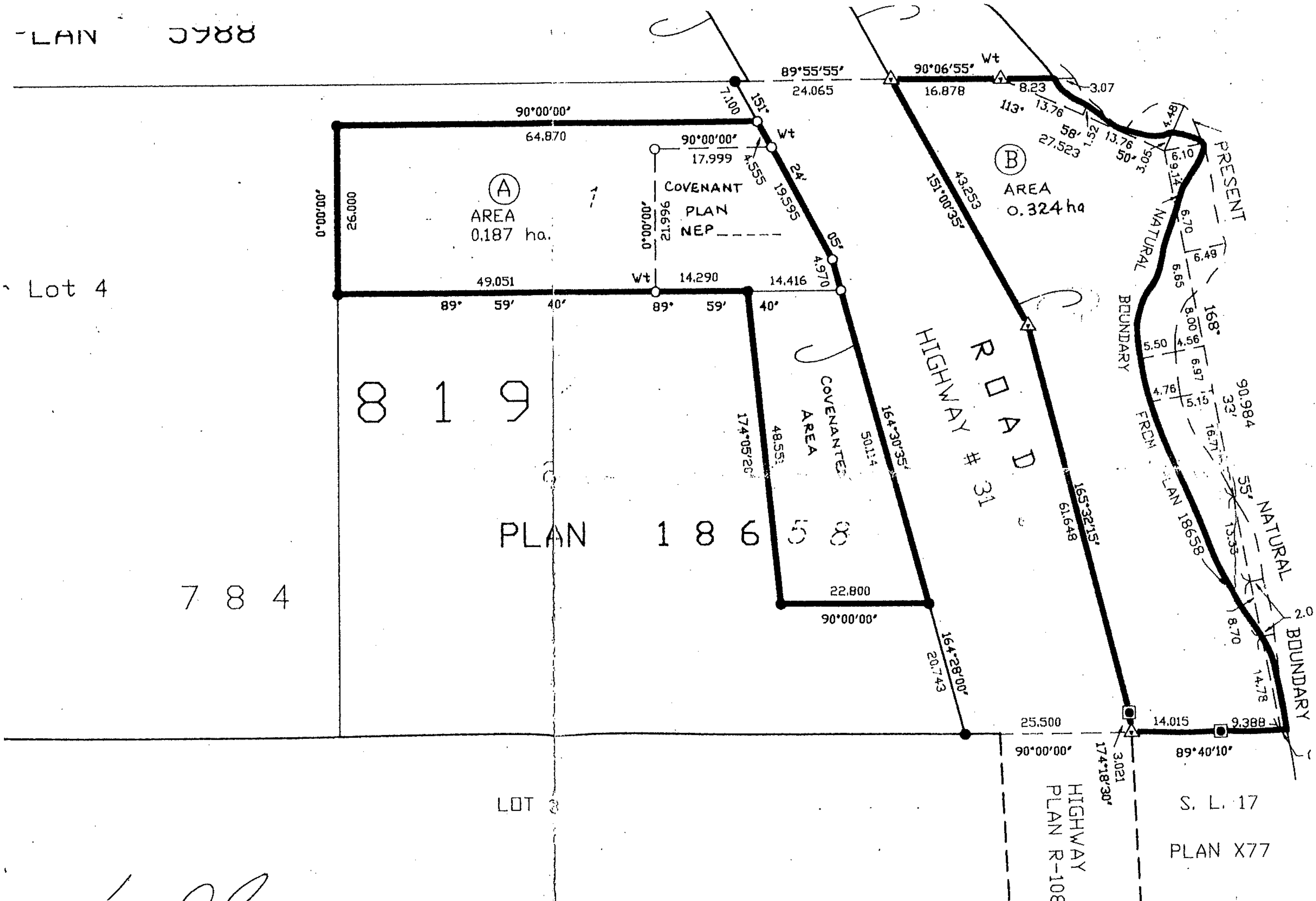
REGIONAL DISTRICT CENTRAL KOOTENAY

202 Lakeside Drive
Nelson, BC
1-800-268-7325
http://www.rdck.ca

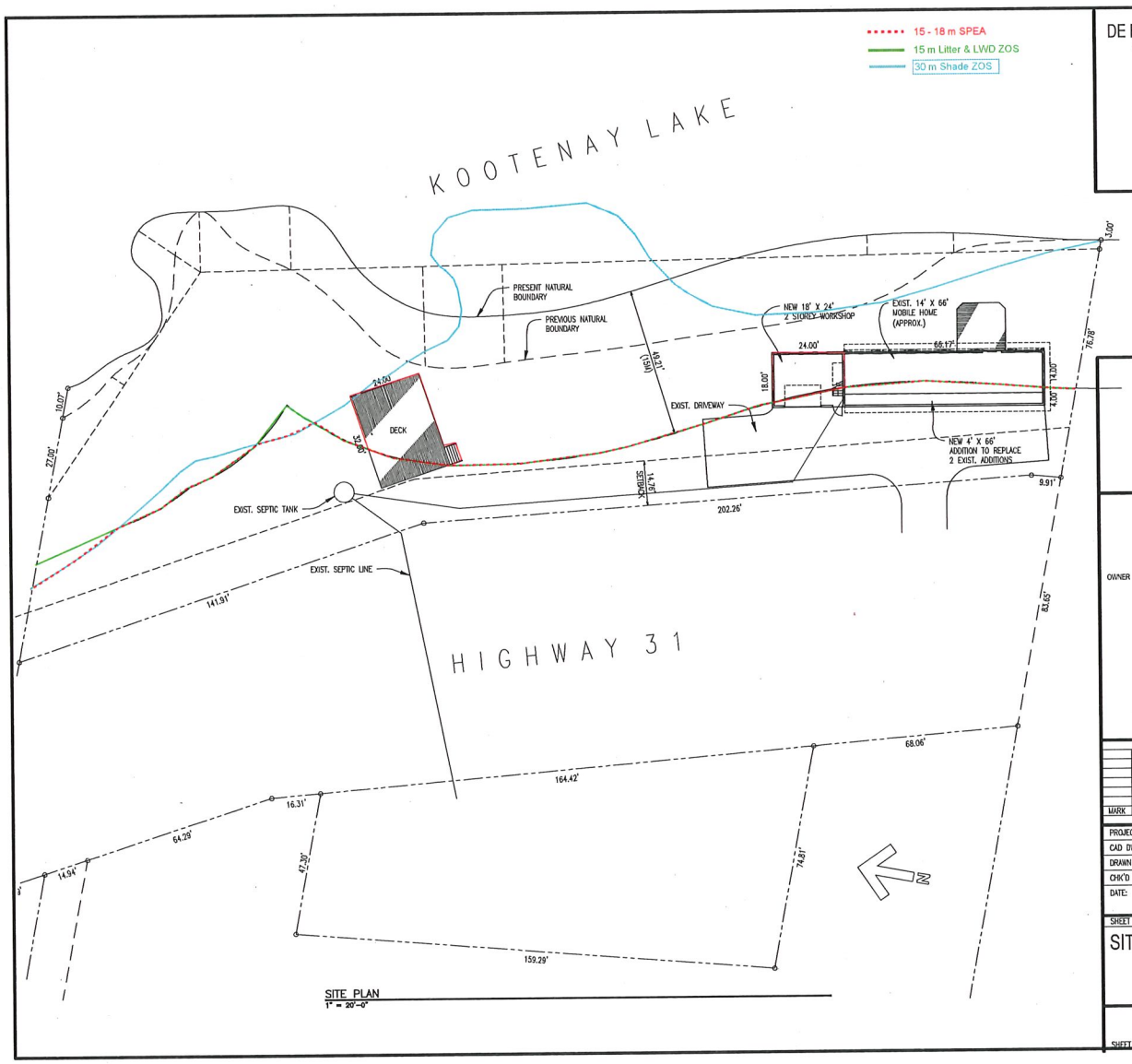
0 5,000.00 Meters 10cm

1 : 50,000.00

APPENDIX 2
SITE SURVEY


Lot 4
8 1 9
PLAN 1 8 6 5 8
7 8 4
LOT 3
A
AREA
0.187 ha.
B
AREA
0.324 ha
COVENANT
PLAN
NEP
COVENANTED
AREA
ROAD
HIGHWAY # 31
HIGHWAY
PLAN R-108
S. L. 17
PLAN X77
PRESENT NATURAL BOUNDARY FROM PLAN 18658
NATURAL BOUNDARY
89°55'55"
24.065
90°06'55"
16.878
90°00'00"
64.870
90°00'00"
17.999
0°00'00"
26.000
0°00'00"
21.996
49.051
89° 59' 40"
14.290
89° 59' 40"
14.416
151° 24' 05"
7.100
4.555
19.595
4.970
174°05'20"
48.559
164°30'35"
50.114
22.800
90°00'00"
164°28'00"
20.743
25.500
90°00'00"
151°00'35"
43.253
165°32'15"
61.648
174°18'30"
3.021
14.015
9.388
89°40'10"
168° 33' 55"
90.984
113° 58' 50"
27.523

APPENDIX 3
SITE PLAN AND SETBACK MAP



DE FELICE DRAFTING & DESIGN
7566 Harrop Procter Road
Nelson, BC, V1L 6R7
pdefelice@shaw.ca
Tel. 1-778-771-5238 or
1-250-551-7700

CLAPP RESIDENCE

5560 HWY. 31
MIRROR LAKE, BC

OWNER
TARA CLAPP

MARK	DATE	DESCRIPTION

PROJECT NO:	170504
CAD DWG FILE:	S1 SITE PLAN.DWG
DRAWN BY:	PAUL DE FELICE
CHK'D BY:	--
DATE:	APRIL 30, 2018

SHEET TITLE
SITE PLAN

SHEET S1 OF 1