

**Riparian Area Protection Regulation (RAPR)
Assessment Report For
4545 Mill Road, Naramata, BC**



Prepared by:

VALLEY ENVIRONMENTAL

David Cassidy, BSc. R.P. Bio.

**3265 Webber Road
Westbank, BC
V4T 1G3**

Date

July 30, 2023

I. Primary QEP Information

First Name	David Cassidy	Middle Name	William
Last Name	Cassidy		
Designation	Biologist	Company	Valley Environmental
Registration #	1556	Email	david.cassidy@shaw.ca
Address	3265 Webber Rd		
City	Westbank	Postal/Zip	V4T 1G3
Prov/state	BC	Country	Canada
		Phone #	250-490-0161

II. Secondary QEP Information

First Name		Middle Name	
Last Name			
Designation		Company	
Registration #		Email	
Address			
City		Postal/Zip	
Prov/state		Country	
		Phone #	

II. Additional QEP Information

First Name		Middle Name	
Last Name			
Designation		Company	
Registration #		Email	
Address			
City		Postal	
Prov/state		Country	
		Phone #	

III. Developer Information

First Name	Robert	Middle Name	
Last Name	Hirtz		
Company			
Phone #	250-870-0746	Email	rhirtz@shaw.ca
Address	1701 SHALERIDGE PL		
City	West Kelowna	Postal/Zip	V1Z 3E4
Prov/state	BC	Country	Canada

IV. Development Information

Development Type	Construction: Single Family Residential		
Area of Development (ha)	0.0114	Riparian Length (m)	22
Lot Area (ha)	0.029	Nature of Development	Re-Development
Proposed Start Date	2022-12-16	Proposed End Date	2024-12-31

V. Location of Proposed Development

Street Address (or nearest town)	4545 Mill Road						
Local Government	Regional District of Okanagan-Similkameen				City Naramata		
Stream Name	Okanagan Lake						
Legal Description (PID)	010-694-471				Region Okanagan (8)		
Stream/River Type	Lake				DFO Area BC Interior		
Watershed Code	310						
Latitude	49	36	27	Longitude	119	35	58

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Section 1. Description of Fisheries Resources Values and a Description of the Development proposal

Okanagan Lake supports a wide variety of salmonid and non-salmonid fish species which include the following: re-introduced sockeye (*Oncorhynchus nerka*), kokanee (*O. nerka*), rainbow trout (*O. mykiss*), carp (*Cyprinus carpio*), largescale sucker (*Catostomus macrocheilus*), mountain whitefish (*Prosopium williamsoni*), lake whitefish (*Coregonus clupeaformis*), northern pikeminnow (formerly northern squawfish) (*Ptychocheilus oregonensis*), smallmouth bass (*M. dolomieu*), prickly sculpin (*Cottus asper*), burbot (*Lota lota*), chiselmouth (*Acrocheilus alutaceus*), redbelt shiner (*Richardsonius balteatus*), black bullhead (*Ameiurus melas*), lake chub (*Couesius plumbeus*), longnose sucker (*Catostomus catostomus*), pumpkinseed (*Lepomis gibbosus*), pygmy whitefish (*Prosopium coulterii*), and peamouth chub (*Mylocheilus caucrinus*). The lake supports a sport fishery for smallmouth bass, kokanee and rainbow trout.

Okanagan Lake provides habitat for all life-history traits of the present salmonid and non-salmonid species. Specifically, rearing (summer and over-wintering) for kokanee and rainbow trout. The lake also provides spawning, incubation and rearing habitat for the non-salmonid species. Near shore habitat is almost entirely natural and consists of sand and small gravel substrate with moderate cover and vegetation (emergent and overhanging).

Much of native ecosystem surrounding the lake is ponderosa pine (*Pinus ponderosa*)/bunchgrass (*Agropyron spicatum*). Water birch (*Betula occidentalis*), a bush-like tree and black cottonwoods (*Populus balsamifera*) are native species also found in the immediate area of the property. These two species make up many of the South Okanagan riparian woodlands. These native plant species exist in small pockets within the 30 meter assessment area. However, the majority of the area immediately surrounding the proposed development is previously developed with single-family homes. Invasive weed species exist on neighbouring lots due to previous disturbance of ground soil and removal of vegetation.

The subject lot has been extensively modified in the past and there is only a few native shrub species along the shoreline and the edges of the property. The property has been continuously manicured (mowed) and was/is used as an amenity/recreational property for camping, beach/swimming and boating use. Neighbouring properties have been highly modified and are primarily manicured beach and grassy areas.

Prior to this riparian assessment, a couple of non-native hazard trees were removed (July 2022) under the RDOS's riparian / watercourse development permit exemption bylaw OCP Bylaw No. 2905, 2021, updated May 18, 2023 – Section 23.4.8 Exemptions (.7) Hazard Tree Removal.

The development is the removal of an existing cabin & shed and the construction of a new home (101.63 m²), septic tanks (11.06 m²) and dry well (1.13 m²). A portion of the existing gravel driveway will remain. Total footprint of new structures is 113.82 m².

Hardship Calculation/Determination

Developable Area (DA) = area of the lot outside of SPEA including natural, legal or local government restrictions such as building setbacks (front, rear, side yard etc.). **Total Potential Developable Area (TPDA)** = area of the lot regardless of SPEA including natural/legal restrictions which may include building setbacks. **Allowable Footprint (AF)** is the % (30% or 40%) of the TPDA.

Property is a Brownfield as historical human disturbance such as the existing cabin, shed, manicured grass, concrete blocks and other amenity areas on the property have removed >70% of the site potential vegetation (SPV). Therefore TPDA is 40% of AF.

Existing Lot:

DA = 0 m² (15 m riparian setback covers most of the property)

TPDA = 290.28 m² (0 m building setbacks supported by RDOS & and section of titled property below the stream boundary subtracted from total lot size (Lot size – section of lot below stream boundary = 303.63 m² – 13.42 m²)... (See site plan)

AF = 0.4 x TPDA = 0.4 x 287.84 m² = 115.14 m²

DA < AF = hardship

Footprint Calculations:

Footprint of Existing Cabin & Shed to be removed = 33.83 m²

Footprint of Proposed New Dwelling = 101.63 m²

Footprint of Proposed Septic Tanks = 11.06 m²

Footprint of Proposed Dry Well (under deck of house) = 1.13 m²

Total Proposed Lot Coverage Under Hardship = 113.82 m² or 39.54%

In summary, the above calculation proves hardship status & the proposed development footprints are less than the 40% calculation for allowable footprint. In addition, the development is as far from the lake as possible and is contiguous with the foreshore of the lake.

The attached site plan details the proposed new development using the 40% hardship calculation.

Mitigation:

As part of a restoration plan, VE has proposed that a portion of the amenity space and manicured grass areas will be replaced with 26 native plants consisting of 1 trees and 25 shrubs (see Section 3: Vegetation Plan).

RDOS Support:

- a. a reduction in setback(s) is supported by Planning staff;
- b. that Section 23.3.6 Variances to Protect the SPEA under [Electoral Area "E" OCP](#) states: "The Regional District encourages Development Variance Permit (DVP) applications for the relaxation of zoning (parcel line) setbacks on existing small lots in order to reduce impacts and preserve the SPEA."
- c. that DVP application has been submitted to RDOS for approval.

2. Results of Detailed Riparian Assessment

Refer to Chapter 3 of Assessment Methodology

Date: July 28, 2023

Description of Water bodies involved (number, type)

Stream	
Wetland	
Lake	Okanagan
Ditch	
Number of reaches	1
Reach #	

Channel width and slope and Channel Type (use only if water body is a stream or a ditch, and only provide widths if a ditch)

	Channel Width(m)		Gradient (%)	
starting point			I, <u>David Cassidy</u> , hereby certify that: a) I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the <i>Fish Protection Act</i> ; b) I am qualified to carry out this part of the assessment of the development proposal made by the developer <u>Robert Hirtz</u> ; c) I have carried out an 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.	
upstream				
downstream				
Total: minus high /low mean				
	R/P	C/P		S/P
Channel Type				

Site Potential Vegetation Type (SPVT)

	Yes	No	
SPVT Polygons		X	Tick yes only if multiple polygons, if No then fill in one set of SPVT data boxes
			I, <u>David Cassidy</u> , hereby certify that: a) I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the <i>Fish Protection Act</i> ; b) I am qualified to carry out this part of the assessment of the development proposal made by the developer <u>Robert Hirtz</u> ; c) I have carried out an 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.
Polygon No:			Method employed if other than TR
SPVT Type	LC	SH	
Polygon No:			Method employed if other than TR
SPVT Type	LC	SH	
Polygon No:			Method employed if other than TR
SPVT Type			

Zone of Sensitivity (ZOS) and resultant streamside protection enhancement area (SPEA)

Segment No:	1	If two sides of a stream involved, each side is a separate segment. For all water bodies multiple segments occur where there are multiple SPVT polygons
LWD, Bank and Channel Stability ZOS (m)	15 m	
Litter fall and insect drop	15 m	

ZOS (m)			
Shade ZOS (m) max	0 m (30 m)	South bank	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> x
Ditch	Justification description for classifying as a ditch (manmade, no significant headwaters or springs, seasonal flow)		
Ditch Fish Bearing	Yes <input type="checkbox"/>	No <input type="checkbox"/>	If non-fish bearing insert no fish bearing status report
SPEA maximum	15 m	(For ditch use table3-7)	

Segment No: If two sides of a stream involved, each side is a separate segment. For all water bodies multiple segments occur where there are multiple SPVT polygons

LWD, Bank and Channel Stability ZOS (m)		South bank	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Litter fall and insect drop ZOS (m)				
Shade ZOS (m) max				

SPEA maximum (For ditch use table3-7)

Segment No: If two sides of a stream involved, each side is a separate segment. For all water bodies multiple segments occur where there are multiple SPVT polygons

LWD, Bank and Channel Stability ZOS (m)		South bank	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Litter fall and insect drop ZOS (m)				
Shade ZOS (m) max				

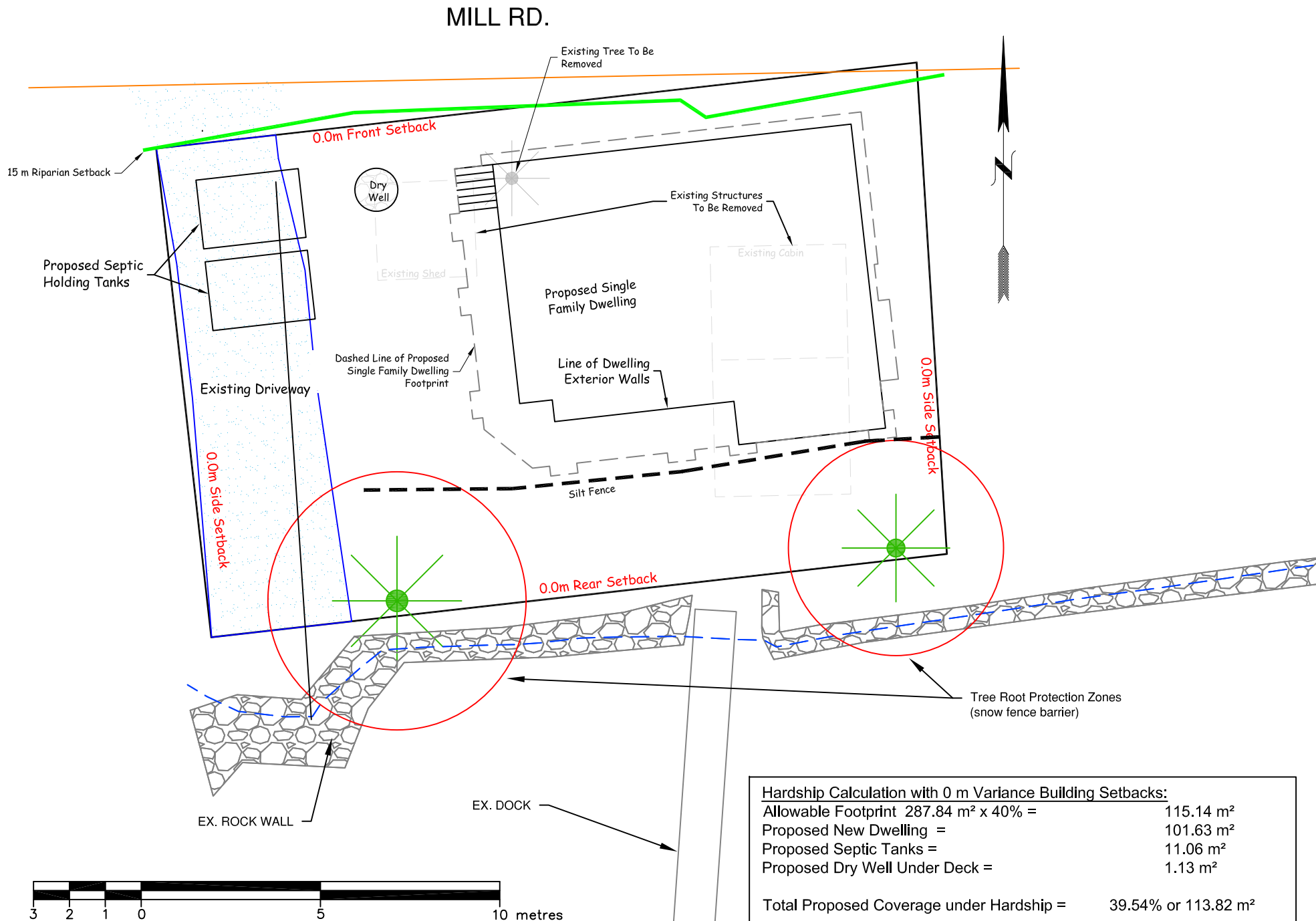
SPEA maximum (For ditch use table3-7)

I, David Cassidy, hereby certify that:

- I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the *Fish Protection Act*;
- I am qualified to carry out this part of the assessment of the development proposal made by the developer Robert Hirtz;
- I have carried out an assessment of the development proposal and my assessment is set out in this Assessment Report; and
- 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.

Comments

Section 3: Site Plan



Hardship Calculation with 0 m Variance Building Setbacks:	
Allowable Footprint 287.84 m ² x 40% =	115.14 m ²
Proposed New Dwelling =	101.63 m ²
Proposed Septic Tanks =	11.06 m ²
Proposed Dry Well Under Deck =	1.13 m ²
Total Proposed Coverage under Hardship =	39.54% or 113.82 m²

Section 4. Measures to Protect and Maintain the SPEA

There is currently no construction proposed at this time however, below are some site specific measures that would be required for a single-family home on the child lot if construction were to occur

1. Danger Trees	
<p>I, <u>David Cassidy</u>, hereby certify that:</p> <p>a) I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the <i>Fish Protection Act</i>;</p> <p>b) I am qualified to carry out this part of the assessment of the development proposal made by the developer <u>Robert Hirtz</u>;</p> <p>c) I have carried out an assessment of the development proposal and my assessment is set out in this Assessment Report; and 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</p>	
2. Windthrow	
<p>I, <u>David Cassidy</u>, hereby certify that:</p> <p>a. I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the <i>Fish Protection Act</i>;</p> <p>b. I am qualified to carry out this part of the assessment of the development proposal made by the developer <u>Robert Hirtz</u>;</p> <p>c. I have carried out an assessment of the development proposal and my assessment is set out in this Assessment Report; and 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</p>	
3. Slope Stability	
<p>I, <u>David Cassidy</u>, hereby certify that:</p> <p>a. I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the <i>Fish Protection Act</i>;</p> <p>b. I am qualified to carry out this part of the assessment of the development proposal made by the developer <u>Robert Hirtz</u>;</p> <p>c. I have carried out an assessment of the development proposal and my assessment is set out in this Assessment Report; and 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</p>	
4. Protection of Trees	
<p>I, <u>David Cassidy</u>, hereby certify that:</p> <p>a. I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the <i>Fish Protection Act</i>;</p> <p>b. I am qualified to carry out this part of the assessment of the development proposal made by the developer <u>Robert Hirtz</u>;</p> <p>c. I have carried out an assessment of the development proposal and my assessment is set out in this Assessment Report; and 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</p>	
5. Encroachment	
<p>I, <u>David Cassidy</u>, hereby certify that:</p> <p>a. I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the <i>Fish Protection Act</i>;</p> <p>b. I am qualified to carry out this part of the assessment of the development proposal made by the developer <u>Robert Hirtz</u>;</p> <p>c. I have carried out an assessment of the development proposal and my assessment is set out in this Assessment Report; and 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</p>	
6. Sediment and Erosion Control	
<p>I, <u>David Cassidy</u>, hereby certify that:</p> <p>a. I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the <i>Fish Protection Act</i>;</p> <p>b. I am qualified to carry out this part of the assessment of the development proposal made by the developer <u>Robert Hirtz</u>;</p> <p>c. I have carried out an assessment of the development proposal and my assessment is set out in this Assessment Report; and 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</p>	
7. Stormwater Management	
<p>I, <u>David Cassidy</u>, hereby certify that:</p> <p>a. I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the <i>Fish Protection Act</i>;</p> <p>b. I am qualified to carry out this part of the assessment of the development proposal made by the developer <u>Robert Hirtz</u>;</p> <p>c. I have carried out an assessment of the development proposal and my assessment is set out in this Assessment Report; and 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</p>	
8. Floodplain Concerns (highly mobile channel)	
<p>I, <u>David Cassidy</u>, hereby certify that:</p> <p>a. I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the <i>Fish Protection Act</i>;</p> <p>b. I am qualified to carry out this part of the assessment of the development proposal made by the developer <u>Robert Hirtz</u>;</p> <p>c. I have carried out an assessment of the development proposal and my assessment is set out in this Assessment Report; and 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</p>	

- 1) Danger Trees – There are no hazard trees on the subject property or within the 15 m riparian setback. Hazard trees were recently removed as per the RDOS watercourse development permit exemption bylaws. The exemption notes that the removal of danger, infested or diseased trees within a riparian areas is exempt from a Watercourse Development Permit under the Electoral Area “E” Official Community Plan No. 2458, 2008, updated May 18, 2023 – Section 23.4.8 Exemptions (.7) Hazardous Tree Removal.
- 2) Windthrow – There are no forests being removed therefore, no windthrow.
- 3) Slope stability – The area of the development is on a flat surface. Slope stability is not anticipated to be an issue in the area of the development however, there is a steep slope across Mill Road. Both the slope and the subject property are within a geotechnical hazard zone according the RDOS mapping layer. A geotechnical assessment was completed by a Geotechnical engineer at Interior Testing Services Ltd. (see attached).

As there is no slope on the property and within the development, there are no slope stability concerns with regards to the proposed home development.

- 4) Tree Protection in the SPEA –The proposed development will remove one existing trees but will not encroach on any existing tree root protection zones. Compensation for the removal of this tree is covered within the restoration planting plan (see attached).
- 5) Encroachment in the SPEA – As the proposed development is a hardship and most of the property is within the 15 m SPEA, there is proposed encroachment into the SPEA setback due to the demolition of the existing cabin and the construction of a new single-family home.
- 6) Sediment and erosion during construction – Sediment delivery is not anticipated to be a significant problem as the areas of development are relatively flat. However, in an abundance of caution, a silt fence will be installed as shown in the site plan.
- 7) Stormwater Management – Resulting stormwater will be directed to a rock pit.
- 8) VE has determined that the location of the active floodplain/stream boundary is located in the area noted in the site plan and ensures that the SPEA starts at the edge of this feature. VE determined that the active floodplain/stream boundary is located along the edge of the rock wall / edge of manicured grass area. The rock wall is intact and the area above and behind the wall has not eroded indicating that flooding with wave action is not commonly above and beyond the rock wall. Therefore, the stream channel at this location would not be considered dynamic such that the area above the wall is typically flooded. As such VE feels that the location of the stream boundary / active floodplain is sufficient in protecting the SPEA as well as the development.

The RDOS has a Floodplain Designation and Flood Construction Level within their Zoning Bylaw (2800, July 7, 2022) to protect structures: 10.1.2 d) *Okanagan Lake: 343.66 m Geodetic Survey of Canada (GSC) datum.*

Section 5. Environmental Monitoring

Monitoring will occur during the initial excavation stages of the proposed development to ensure protection of the identified SPEA setback. Following initial excavation for construction, monitoring will occur on a full time basis until the development is completed to ensure compliance and protection of existing riparian vegetation and near stream habitat. Each contractor involved with the proposed development will relay to their site workers the specific measures indicated in this document (Section 4), to protect and maintain the SPEA and riparian habitat. If the measures are breached site workers will immediately inform their foreman or supervisor who will in turn immediately contact the Environmental Monitor. In the absence of a foreman the site worker will contact the Environmental Monitor directly by phone. All work leading to the breach of the measures will stop immediately until consultation and approval from the Environmental Monitor. The environmental monitor or QEP for this development is David Cassidy of VE at 250-490-0161.

A post-development monitoring report will be prepared and filed with the Ministry of Environment following construction. A post vegetation planting report will also be prepared and filed with the local government.

Section 6. Photos



August 7, 2022 – View looking west and upstream along the stream boundary of Okanagan Lake adjacent to the subject property. Visible is the rock wall and manicured beach and lawn areas.



August 7, 2022 – View looking east and downstream along the stream boundary of Okanagan Lake adjacent to the subject property. Much of the riparian assessment area of adjacent properties contain a manicured amenity area. Much of the property has been historically used as a recreational property where the SPEA contains beach areas, manicured grass and gravel parking and picnic areas. Some native trees such as pines and cottonwoods are visible on adjacent properties however, understory species such as shrubs and grasses have been removed historically removed including the subject property.



August 7, 2022 – View looking north east at the existing cabin area, manicured lawn and gravel areas. Much of the property has been modified and >70% of the natural site potential vegetation has been removed. The property has been used as an amenity space and recreational property. As such the property is currently and historically a brownfield.

Section 7. Professional Opinion

Qualified Environmental Professional opinion on the development proposal's riparian assessment.

Date

1. I/We David Cassidy, RPBio.

hereby certify that:

- a) I am/We are qualified environmental professional(s), as defined in the Riparian Areas Protection Regulation made under the *Riparian Areas Protection Act*,
- b) I am/We are qualified to carry out the assessment of the proposal made by the developer Robert Hirtz, which proposal is described in section 3 of this Assessment Report (the "development proposal"),
- c) I have/We have carried out an assessment of the development proposal and my/our assessment is set out in this Assessment Report; and
- d) In carrying out my/our assessment of the development proposal, I have/We have followed the specifications of the Riparian Areas Protection Regulation and assessment methodology set out in the minister's manual; AND

2. As qualified environmental professional(s), I/we hereby provide my/our professional opinion that:

- a) the site of the proposed development is subject to undue hardship, (if applicable, indicate N/A otherwise) and
- b) the proposed development will meet the **riparian protection standard** if the development proceeds as proposed in the report and complies with the measures, if any, recommended in the report.

Recommended Native Plant Species for Riparian Fish and Wildlife Habitat in the Southern Interior - Okanagan

Deciduous Trees

Botanical Name	Common Name
<i>Acer glabrum</i> var. <i>douglasii</i>	Douglas maple
<i>Acer macrophyllum</i>	broadleaf maple
<i>Populus balsamifera</i> or <i>P. trichocarpa</i>	black cottonwood
♦ <i>Prunus virginiana</i>	choke cherry
<i>Rhamnus purshiana</i>	cascara
<i>Salix lucida</i> ssp. <i>lasiandra</i>	Pacific willow

Coniferous Trees

Botanical Name	Common Name
<i>Pinus ponderosa</i>	ponderosa pine
<i>Pseudotsuga menziesii</i>	Douglas-fir
<i>Populus tremuloides</i>	trembling aspen

Shrubs

Botanical Name	Common Name
<i>Amelanchier alnifolia</i>	saskatoon
<i>Cornus sericea</i> or <i>C. stolonifera</i>	red-osier dogwood
<i>Corylus cornuta</i> var. <i>californica</i>	beaked hazelnut
<i>Holodiscus discolor</i>	oceanspray
<i>Physocarpus capitatus</i>	Pacific ninebark
<i>Prunus virginiana</i>	choke cherry
<i>Rosa nutkana</i>	Nootka rose
<i>Rubus parviflorus</i>	thimbleberry
<i>Rubus spectabilis</i>	salmonberry
<i>Salix lucida</i> spp. <i>lasiandra</i>	Pacific willow
<i>Salix scouleriana</i>	Scouler's willow
<i>Salix sitchensis</i>	Sitka willow
<i>Sambucus caerulea</i> or <i>S. glauca</i>	blue elderberry
<i>Sambucus racemosa</i> var. <i>arborescens</i>	red elderberry
<i>Sorbus sitchensis</i>	Sitka mountain ash
<i>Symphoricarpos albus</i>	snowberry
<i>Vaccinium parvifolium</i>	red huckleberry

Grasses

Botanical Name	Common Name
<i>Achnatherum hymenoides</i>	great basin wild rye
<i>Festuca idahoensis</i>	Idaho fescue
<i>Festuca campestris</i>	rough fescue
<i>Hesperostipa comata</i>	needle and thread grass
<i>Koeleria macrantha</i>	junegrass
<i>Pseudoroegneria spicatum</i>	bluebunch wheatgrass
<i>Achnatherum hymenoides</i>	sand ricegrass
<i>Poa secunda</i>	sandberg's bluegrass