



# Development Permit Application

Referral Form – RDCK File DP2207A

Date: November 10, 2022

You are requested to comment on the attached DEVELOPMENT PERMIT for potential effect on your agency's interests. We would appreciate your response WITHIN 30 DAYS (PRIOR TO December 13, 2022). If no response is received within that time, it will be assumed that your agency's interests are unaffected.

**LEGAL DESCRIPTION & GENERAL LOCATION:**

LOT A DISTRICT LOT 4962 KOOTENAY DISTRICT PLAN EPP116252  
17140 Pilot Bay Road, Kootenay Bay, Electoral Area 'A' (PID: 031-577-792)

**PRESENT USE AND PURPOSE OF PERMIT REQUESTED:**

The property is currently vacant with the exception of concrete foundation walls that have been constructed for a future dwelling. The lot is approximately 1 hectare in size and divided by Pilot Bay Road. The future dwelling will be located on the 0.25 hectare portion adjacent to Kootenay Lake on the west side of Pilot Bay Road. A future septic disposal field will be located on the larger 0.75 hectare portion on the east side of the Road and wastewater will be pumped across the Right-of-way.

An excavation contractor inadvertently placed fill and disturbed lands within the Environmentally Sensitive Development Permit Area (ESDPA). The purpose of this application is to assess the extent of disturbance to the Riparian Area of Kootenay Lake and determine the level of restoration works required.

AREA OF PROPERTY AFFECTED	ALR STATUS	ZONING	OCP
1 hectare	N/A	N/A	Comprehensive Land Use Bylaw No. 2315 Country Residential (RC) and Resource Area (RA)

**APPLICANT:** Gregory Stirling

**OTHER INFORMATION: ADVISORY PLANNING COMMISSION PLEASE NOTE:**

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

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

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

ZACHARI GIACOMAZZO, PLANNER  
REGIONAL DISTRICT OF CENTRAL KOOTENAY

- MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE
- HABITAT BRANCH (Environment)
- FRONTCOUNTER BC (MFLNRORD)
- AGRICULTURAL LAND COMMISSION
- REGIONAL AGROLOGIST
- ENERGY & MINES
- MUNICIPAL AFFAIRS & HOUSING

- REGIONAL DISTRICT OF CENTRAL KOOTENAY
- DIRECTORS FOR:
- A  B  C  D  E  F  G  H  I  J
- K
- ALTERNATIVE DIRECTORS FOR:
- A  B  C  D  E  F  G  H  I  J
- K
- APHC AREA

- INTERIOR HEALTH, HBE TEAM
- KOOTENAY LAKES PARTNERSHIP (FORESHORE DEVELOPMENT PERMITS)
- SCHOOL DISTRICT NO.
- WATER SYSTEM OR IRRIGATION DISTRICT
- UTILITIES (FORTIS, BC HYDRO, NELSON HYDRO, COLUMBIA POWER)

FIRST NATIONS

- KTUNAXA NATION COUNCIL
  - YAQAN NU?KIY (LOWER KOOTENAY)
  - ?AKINK'UM?ASNUQ?I?IT (TOBACCO PLAINS)
  - ?AKISQNUK (COLUMBIA LAKE)
  - ?AQ'AM (ST. MARY'S)

- RDCK FIRE SERVICES
- RDCK EMERGENCY SERVICES
- RDCK BUILDING SERVICES
- RDCK UTILITY SERVICES
- RDCK RESOURCE RECOVERY
- RDCK REGIONAL PARKS

INSERT COMMENTS ON REVERSE . . .

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

**RESPONSE SUMMARY**  
**FILE: DP2207A APPLICANT: GREGORY STIRLING**

**Name:**

**Date:**

**Agency:**

**Title:**

RETURN TO: ZACHARI GIACOMAZZO, PLANNER  
DEVELOPMENT AND COMMUNITY SUSTAINABILITY SERVICES  
REGIONAL DISTRICT OF CENTRAL KOOTENAY  
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NELSON, BC V1L 5R4  
Ph. 250-352-8153  
Email: [plandept@rdck.bc.ca](mailto:plandept@rdck.bc.ca)

# 17140 Pilot Bay Road (DP2207A) - Location Map



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

- Streams and Shorelines
- Electoral Areas
- RDCK Roads
- Cadastre
- Civic Address

**Map Scale:**

1:4,000

Date: November 10, 2022



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.

# 17140 Pilot Bay Road (DP2207A) - Land Use Map



Maxar



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

### Legend

- |                                  |                 |
|----------------------------------|-----------------|
| Flood Construction Levels - 1990 | Electoral Areas |
| Official Community Plan          | RDCK Roads      |
| Streams and Shorelines           | Cadastre        |

### Map Scale:

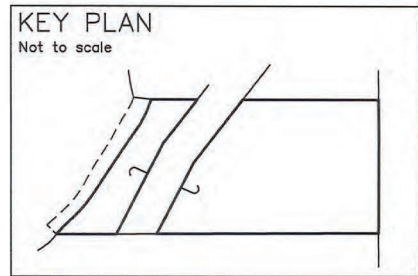
1:10,000

Date: November 10, 2022



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.

# SKETCH PLAN SHOWING SETBACKS AND POTENTIAL ACCRETION AREA FOR PART OF LOT 7 DL 4962 KD PLAN 3065.



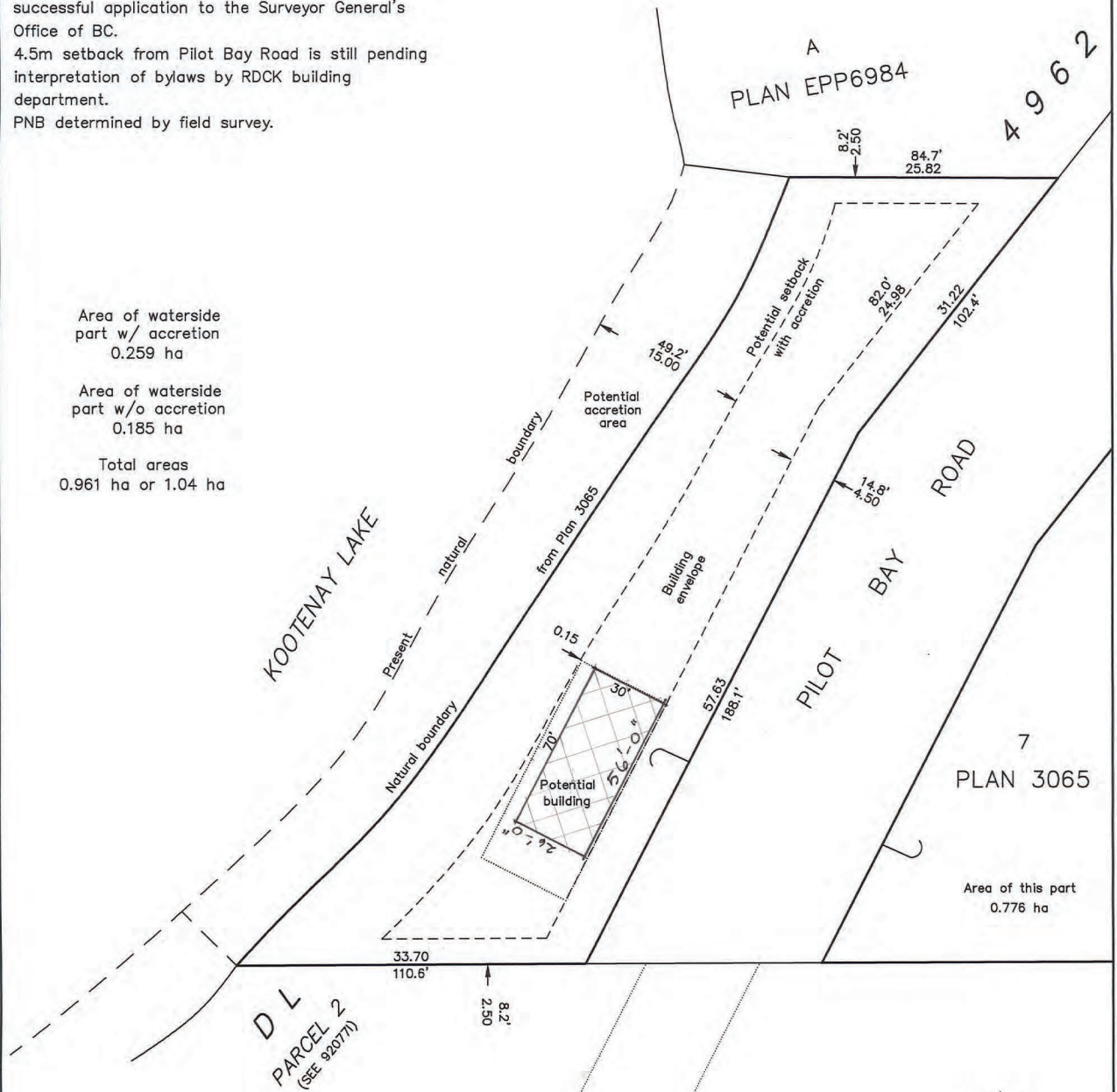
## LEGEND

Dimensions derived from Plan 3065.  
 All dimensions are in metric unless otherwise noted.  
 Accretion location and amount subject to  
 successful application to the Surveyor General's  
 Office of BC.  
 4.5m setback from Pilot Bay Road is still pending  
 interpretation of bylaws by RDCK building  
 department.  
 PNB determined by field survey.

Area of waterside  
 part w/ accretion  
 0.259 ha

Area of waterside  
 part w/o accretion  
 0.185 ha

Total areas  
 0.961 ha or 1.04 ha



**HANGO LAND SURVEYS**  
 Joshua Hango  
 BC Land Surveyor  
 2924 9th Avenue  
 Castlegar, BC V1N 2Z1  
 (250) 365-5342  
 2883-sk  
[www.hangolandsurveys.com](http://www.hangolandsurveys.com)

Survey date: August 17, 2021  
 Drawing date: August 24, 2021

## 16.0 DEVELOPMENT PERMIT AREAS

### Background

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

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

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

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

#### Category

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

#### Justification

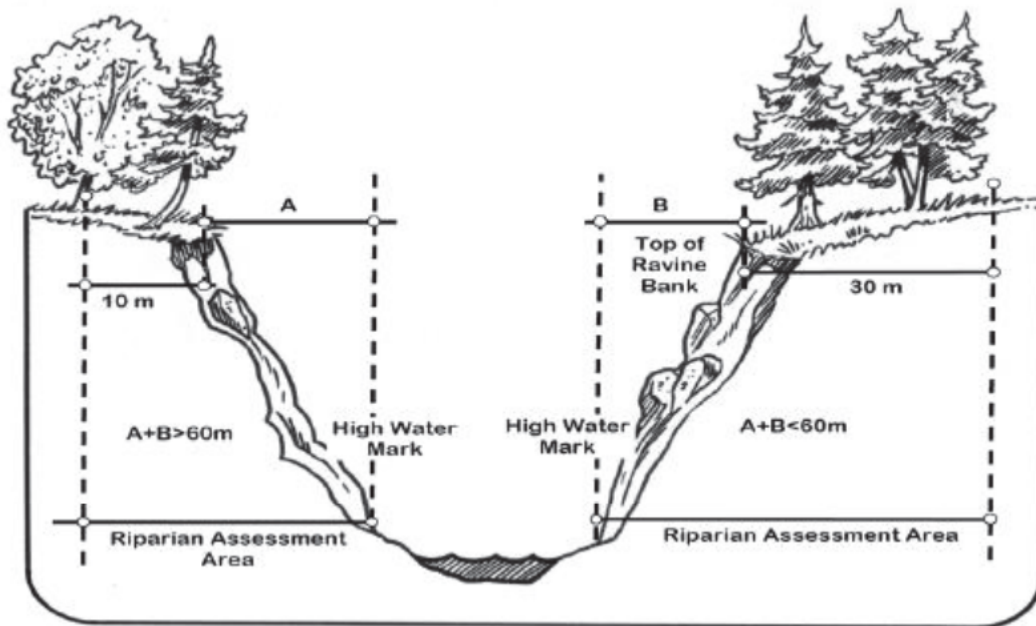
The primary objective of this Development Permit Area designation is to regulate development activities in watercourses, lakes and wetlands and their adjacent riparian areas so as to protect aquatic habitat; and to conserve, enhance and, where necessary, restore watercourses and their riparian areas.

#### Area

The ESDP area is comprised of:

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

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



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

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

Where the following definitions apply:

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

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

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



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

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

### **Guidelines**

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

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

### **Development shall be in accordance with the following guidelines:**

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

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

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

### **Exemptions**

The ESDP area does not apply to the following:

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

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

#### **Designation**

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

#### **Area**

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

#### **Justification**

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



**17140 PILOT BAY RD  
CRAWFORD BAY, 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

Oct 28, 2022



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**ABBREVIATIONS**

- AHI: Aquatic Habitat Index
- ESDP: Environmentally Sensitive Development Permit
- FIM: Foreshore Inventory Mapping
- GSC: Geodetic Survey of Canada
- HWM: High Water Mark
- 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
- ZOS: Zones of Sensitivity

## 1 INTRODUCTION

Masse Environmental Consultants Ltd. was retained by [REDACTED] in early September to conduct a riparian assessment to accompany an application for an Environmentally Sensitive Development Permit (ESDP) on 17141 Pilot Bay Road (LOT A PLAN EPP116252 DISTRICT LOT 4962 KOOTENAY LAND DISTRICT). The requirement for a development permit arose when there was inadvertent placement of fill material by the excavation Contractor within the ESDP area.

A site visit was completed on September 22, 2022 by Fiona Lau B.Tech., A.Sc.T., 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 mitigate or compensate for the alteration of the riparian area to maintain environmental values. It is based on the following regulatory framework and best management practices documents:

- Electoral Area 'A' Rural Official Community Plan Bylaw *No. 2315, 2013*
- British Columbia *Riparian Areas Regulation*
- Kootenay Lake Shoreline Management Guidelines
- British Columbia *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
- British Columbia Firesmart Homeowners Manual
- Riparian Factsheet No. 6 – Riparian Plant Acquisition and Planting
- A Homeowner's Guide to Stormwater Management

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, 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.

## **2 PROJECT OVERVIEW**

### **2.1 Location**

The subject property is in Pilot Bay, BC, and is bordered by private property to the north and south, MoTI ROW to the east, and Kootenay Lake to the west. The property covers 2.57 acres with ~85 m of frontage on Kootenay Lake. The property is bisected by Pilot Bay Road with the foreshore portion of the property covering 0.62 acres.

The project area is within the Interior Cedar Hemlock very dry warm variant 1 (ICHxw) biogeoclimatic subzone (MacKillop and Ehman 2016). The ICHxw is transitional between dry and moist climatic regions and is characterized by very hot, very dry summers; and mild winters with low snowfall. Spring and summer are also dry and warm. The snowpacks are very shallow to shallow in January and February and winter rain on snow events are frequent and snow free areas are common (MacKillop and Ehman 2016).

### **2.2 Existing Site Conditions**

The subject property is located on the south end of a shallow bay area on the east shore of Kootenay Lake. The property below Pilot Bay Road is gently sloped (13-15% gradient) along the foreshore for the first 15 m, where then it steepens to a 50-80% slope up to Pilot Bay Road.

The subject property appears to have been mostly forested with previous development which included a cabin, boathouse and marine rail system (Photo 1). Prior to the Owner's purchase of the property, the existing cabin and boathouse were demolished and removed and some earthwork activities on the foreshore portion of the property were conducted (Photo 2). Exact locations and extent of previous development is largely unknown; however, some rock and fill were placed within the 15 m ESDP area as seen on Photo 2. Most recently in 2022, material from the house excavation has been placed into the ESDP area. Remnants of the old marine rail are still in place along the shoreline at the north end of the property. A new dock (Photo 4) has been installed on the foreshore of the property within crown land meeting the general permission requirements under the Provincial Water Sustainability and Land Acts (Photo 4). Approximately 70% of the riparian area remains undisturbed on the subject property. Riparian areas within properties to the north have been largely impacted by development over the years, while the riparian area to the south remains undeveloped and in natural condition.

Development activities within the ESDP area included:

- Removal of riparian vegetation (total area unknown); and
- Inadvertent placement of excavated fill material along the west and north end of the house (~394 m<sup>2</sup>).

During the site visit, the visible high-water mark (HWM) was confirmed to be between 533.6-534.22 m elevation as shown on the legal survey completed in 2021 by Hango Surveys (Appendix 2). Flood tolerant emergent plants were observed below the natural HWM.



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.”



Photo 1. Aerial view of forested foreshore area, 2015 Google Earth Imagery.



Photo 2. View of previous earthwork activities prior to property purchase, 2021 photo credit Greg Stirling.



Photo 3. Current view of foreshore disturbance area looking east, Sept 22, 2022.



Photo 4. Current view of new house foundation and elevated bench along west side of house, Sept 22, 2022.

### 2.3 Proposed Development

The proposed development within the 15 m ESDP area includes:

- Construction of a cantilevered deck (6 m<sup>2</sup>).
- Restoration of a portion of the riparian area: partial fill removal by removing all rock and fill within the 7.5 m from the natural boundary (~44m<sup>2</sup>) and regrading a section of bank (~40 m long x 3-5 m wide) at 2.5 (H): 1 (V) slope. This area will be revegetated with native plants (~150 m<sup>2</sup>). Fill material removed will be used as backfill around the house.
- Some of the fill material placed within the 15 m ESDP up to 7.5 m from the natural boundary of Kootenay Lake will not be removed due to onsite challenges and location of the house foundation. General landscaping activities are recommended for this area as per Section A (Appendix 2) (~150 m<sup>2</sup>; ie. soft landscaping which can include placement of topsoil, seeding, planting and pervious surfaces).
- Placement of a patio along the west side of the home on top of retained fill (~50 m<sup>2</sup>)
- New walking path (~0.7 m wide) from basement level of house to foreshore.
- Installation of new waterline into Kootenay Lake.

Refer to Section 7 and Appendix 2 for proposed site and mitigation plan.

### 2.4 Services

Domestic water for the main house will be extracted from Kootenay Lake. Water service line will be installed to the new home approximately at the mid section of the property. The approved septic plan includes a precast septic tank and pump chamber which will pump sewage through a 2" HDPE force main uphill across Pilot Bay Road to a septic dispersal field on the upper portion of the property sited >30 m from the natural boundary of Kootenay Lake, in accordance with the Sewerage System Standard Practice Manual Version 3 (HPBMOH 2014).

## 3 REGULATORY REVIEW

### 3.1 Streamside Protection and Enhancement Area

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 2.

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 12-17 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 -17 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 <sup>1</sup>	Zones of Sensitivity			SPEA
		LWD	Litter fall	Shade	
Kootenay Lake	TR	15 m	15 m	12-17 m	<b>15-17 m</b>

<sup>1</sup> SPVT: site potential vegetation type (TR-tree)

### 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 2020) were used to help determine site specific risk for riparian habitat, Ktunaxa Nation cultural values, and archaeological resources along the shoreline. The property is within FIM segment 137 and indicates that the foreshore is located within an area with emergent vegetation and has moderate juvenile rearing potential (EEC 2016, KLP 2020). Table 2 provides the environmental and archaeological risk results identified in the FIM along the shoreline of the property.

Table 2. Environmental and archaeological risk results.

Aquatic Habitat Index Rating (AHI)	Aquatic Sensitivity	Archaeological Risk	Enhanced Engagement Required
Moderate	Yes	Red	Yes

## 4 RESOURCES

### 4.1 Fish and Aquatic Habitat

#### 4.1.1 Kootenay Lake

The foreshore of the property consists of a gently sloped beach (~13% gradient) with substrate consisting of angular cobble and gravel (Photo 5 and Photo 6). Some emergent vegetation located below the HWM of the lake was observed and would provide both cover and nutrient input to fish (Photo 7). The newly installed dock has been equipped with decking material, which allows light to penetrate the water and minimizes shading effects to fish and fish habitat (Photo 8). Fish habitat along this section of foreshore

supports juvenile rearing habitat with coarser substrates providing cover. No known kokanee spawning has been reported in this area (EEC 2016).

Kootenay Lake supports a variety of fish species, including several species of regional interest, such as rainbow trout, bull trout, kokanee, white sturgeon, Westslope cutthroat trout, and burbot. Mussels were not observed along the foreshore; however, a complete mussel survey was not conducted as part of the initial site visit.



Photo 5. View of foreshore looking north.



Photo 6. View of angular cobble and gravel substrate.



Photo 7. View of emergent vegetation growing along the beach.

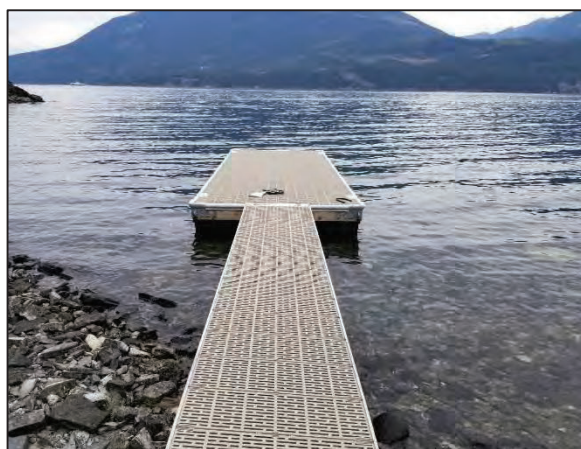


Photo 8. Newly installed dock with light penetrating decking material.

## 4.2 Riparian Vegetation

The riparian area has been partially disturbed by the removal of native vegetation, where fill and rock were placed (Photo 9 and 10). The narrow band of undisturbed riparian vegetation (6-7.5 m) along the west side of the house and at the northwest and southeast corners of the property supports an ecologically diverse and functioning riparian system including a mixture of varying stand age conifers, black cottonwood (*Populus balsamifera*), paper birch (*Betula papyrifera*), with some understorey vegetation (Photo 11 and 12). There are large, exposed bedrock outcroppings and shallow topsoil layers evident throughout the

riparian area making tree cover sparse and drought tolerant shrubs sporadic (Photo 13). Typical upland riparian habitat along this shoreline changes into a more dense forest, with deeper topsoil layers and plant root systems (Photo 14). Refer to Table 3 for list of riparian vegetation species encountered on the property.



Photo 9. Existing riparian vegetation and disturbance along foreshore.



Photo 10. View of sparse riparian vegetation .



Photo 11. Undisturbed riparian forest at SE corner of property.



Photo 12. Area of undisturbed riparian vegetation at NW corner of property.



Photo 13. Exposed bedrock along the foreshore fronting the house.



Photo 14. View of upland dense forest, south of property.

Table 3. Plant species encountered on the property.

Common Name	Scientific Name	Common Name	Scientific Name
<b>Trees</b>		<b>Tall Shrubs cont.</b>	
trembling aspen	<i>Betula tremuloides</i>	rose sp.	<i>Rosa sp.</i>
black cottonwood	<i>Populus balsamifera</i>	saskatoon	<i>Amelanchier alnifolia</i>
Douglas-fir	<i>Pseudotsuga menziesii</i>	sitka alder	<i>Alnus crispa</i>
grand fir	<i>Abie grandis</i>	soopolallie	<i>Shepherdia canadensis</i>
lodgepole pine	<i>Pinus contorta</i>	wild strawberry	<i>Fragaria virginia</i>
paper birch	<i>Betula papyrifera</i>	<b>Herbaceous</b>	
Ponderosa pine	<i>Pinus ponderosa</i>	common wormwood	<i>Artemisia absinthium</i>
western hemlock	<i>Tsuga heterophylla</i>	leafy aster	<i>Aster foliaceus</i>
western redcedar	<i>Thuja plicata</i>	spotted knapweed	<i>Centaurea stoebe</i>
western white pine	<i>Pinus monticola</i>	sweet scented bedstraw	<i>Galium trifolium</i>
<b>Shrubs</b>		wall lettuce	<i>Mycelis muralis</i>
Douglas maple	<i>Acer glabrum</i>	wild ginger	<i>Asarum caudatum</i>
kinnikinnick	<i>Arctostaphylos uva-ursi</i>	Moss sp.	
Oregon grape	<i>Mahonia aquifolium</i>		
red osier dogwood	<i>Cornus stolonifera</i>		

### 4.3 Wildlife

#### 4.3.1 Reptiles and Amphibians

The rock outcrops and vegetated riparian areas provide habitat for northern alligator lizard (*Elgaria coerulea*), western skink (*Plestiodon skiltonianus*) and garter snakes (*Thamnophis* spp.).

#### 4.3.2 Birds

No birds were observed during the survey; however, the subject property is likely visited by songbirds, waterfowl, and raptors. No nests were observed during the site assessment, although the vegetation at the south and north end of the property provides suitable nesting habitat for songbirds. The mature black cottonwood trees provide both perch and nesting habitat for raptors and nesting sites for sapsuckers and cavity dwellers.

#### 4.3.3 Mammals

The property provides potential forage habitat for ungulates, bears and small mammals within the undeveloped portion of the property.

### 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, four species at risk occurrences are known within 10 km of the project area:

- 1) The Upper Kootenay River white sturgeon (*Acipenser transmontanus*) population. The property is located ~10 km away from the white sturgeon Critical Habitat Area within the Crawford Creek Delta (Environment Canada 2014).
- 2) Western skink recorded observation near Pilot Bay Provincial Park ~1.9 km away. Subject property provides good skink habitat.
- 3) Coeur d'alene salamander (*Plethodon idahoensis*) recorded observations near Crawford Bay 5.4 km from the subject property. Subject property does not provide suitable habitat for Coeur d'Alene salamander.
- 4) Rocky Mountain painted turtle (*Chrysemys picta* pop.2) recorded observation in Fraser Lake, ~2.8 km away. Subject property does not provide suitable habitat for turtles.

### 4.5 Archaeological and Heritage Resources

Kootenay Lake is part of the traditional territory of the Ktunaxa, Sinixt and Syilx Okanagan 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. Archaeological Chance Find Procedures are provided in Appendix 3 for guidance on which protocols to follow in the event of a chance archaeological find, to ensure that archaeological sites are documented and protected as required for compliance with the BC Heritage Conservation Act.

## 5 IMPACT ASSESSMENT

The proposed works were assessed based on current site conditions and proposed construction activities within the 15 m SPEA. Impacts associated with the fill placement within the SPEA include removal of riparian vegetation impacting the function of the riparian area by reducing large woody debris recruitment, shade

potential, water temperature regulation, nutrient input including litter fall and insect drop and removal of potential wildlife habitat. The proposed patio area (50 m<sup>2</sup>) along the west side of the house within a previously disturbed area will cause the permanent removal of potential riparian habitat. All other disturbed areas within the SPEA have the potential to become naturalized over time with the implementation of the mitigation plan.

Increased human activity within the riparian area has the potential to reduce wildlife habitat for birds, mammals and amphibians, increased noise and light disturbance to local wildlife, increased sediment and erosion potential, and increased stormwater runoff.

Provided that measures to protect the SPEA are followed and the recommended mitigation plan is implemented, the negative impacts from the existing works and future use of the property to fish and wildlife will be alleviated and riparian function will be partially restored over time.

## **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 in the northern portion of site is sparse; and no hazard tree indicators were observed. A certified danger tree assessor was not retained as a part of this assessment.

### **6.2 Windthrow**

Potential for windthrow risk to trees located in the SPEA was assessed and no indication of potential risk was identified. 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).

### **6.3 Slope Stability**

No slope stability hazard indicators were observed during the site visit. 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.
- No further removal of existing vegetation.
- Excavation to remove the placed fill within 7.5 m from the HWM should ensure that the native ground is exposed but not further disturbed. This will ensure the native soils and seedbank are retained to help in re-establishing riparian vegetation within the SPEA.



- Removal of fill around existing tree trunks and roots shall be completed with care, as to not damage the tree.
- No pollutants should be allowed to contaminate the soil and should be cleaned up immediately if a spill occurs.

### **6.5 Encroachment**

Further development beyond the previously disturbed areas and restoration areas is discouraged to preserve the function of the remaining riparian vegetation, and to promote re-establishment of riparian vegetation.

### **6.6 Sediment and Erosion Control**

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

- 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.
- Disturbed soils should be revegetated as soon as possible after construction.

### **6.7 Stormwater Management**

The proposed development may result in an increase in the total impervious area of the property. The following mitigation measures will help decrease stormwater impacts:

- Downspouts from house 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 application legislation.

### **6.8 Floodplain Concerns**

The proposed house is located outside the 15 meter floodplain setback of Kootenay Lake. The fill material placed within the 15 m floodplain setback does not structurally support the home, therefore, does not trigger the floodplain bylaw. There were no floodplain concerns observed on the subject property.

### **6.9 Scheduling of Environmentally Sensitive Activities**

Works should be scheduled to avoid any additional impacts to SPEA vegetation, aquatic habitat, and nesting birds. The best timing for waterline installation is September-April when Kootenay Lake water levels are low. Works in and around existing trees and shrubs should be monitored for nesting birds when completed during the bird nesting season (April 15-August 15) to minimize disturbance.

### **6.10 Protection of Fish Habitat**

Protection of fish habitat shall be implemented by:

- Limit beach modification for installation of waterline to permitted areas and preserve foreshore vegetation and boulders which provide fish habitat during periods of inundation.
- Adhere to sediment, 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 can potentially 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.
- Hand pull invasive weeds such as spotted knapweed which were observed on the property.

## **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 restore the riparian area are being recommended and are described in the following sections. Refer to Appendix 2 for mitigation and proposed site plan.

Remediation options were assessed, and it was determined that the native ground below the fill material is most likely exposed bedrock with shallow top soil layers. The remediation plan involves removal of rock

and fill from within the 7.5 m setback to native ground, re-grading of the fill material from a 1:1 slope, back to a 2.5:1 slope and revegetating the slope. Due to the lack of growing medium in the fill material and the warm, west facing aspect, revegetation of the slope will be achieved by creating a long deep trench (~40 m long x 3 m wide and up to 1 m deep). The trench will be lined with commercial grade non-woven landscape fabric, filled with top soil mixed with peat moss and re-vegetated with native species (Section 7.1; Appendix 2).

## **7.1 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 area will require re-grading and re-vegetating with a combination of native potted stock and re-seeding disturbed soils with specifically formulated dryland seed blend to promote shrub habitat establishment.

The final plant species selection and quantities shall be determined by the QEP in consultation with the Owners 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 it becomes naturalized over the moderate to long term.

### *Bank Restoration (150 m<sup>2</sup>)*

- Plant minimum 130 native shrubs and perennials on bank at ~1 m spacing. Refer to Table 4 for recommended plant list.
- Some rocks can be placed sporadically on the slope to create habitat complexity and cover for reptiles.
- Spread bark mulch on slope around plants (4" deep). Keep area around stem free of mulch. Mulch will help retain moisture and reduce erosion on this warm, dry facing slope.
- Native shrubs shall also be planted along the toe of slope where rock was removed if suitable planting areas exist and seeded with recommended seed mix blend (Table 5).
- Irrigate initially and throughout the growing season (May- September).

### *General Landscaping Area (150m<sup>2</sup>)*

- Apply layer of topsoil to area minimum 2" thick.
- Spread recommended drought tolerant seed mix on soil at a rate of 30 kg/Ha and rake in. Refer to Table 5 for recommended seed mix.
- Add soft landscaping, at the Owners discretion. This can include additional soil, plants and pervious surfaces (ie. gravel, mulch).
- Irrigate, as required.

### *General Planting and Maintenance Guidelines*

- Planting should not occur during periods of hot dry weather unless they are irrigated daily.

- Dryland erosion seed blend, specially formulated with drought tolerant species for soil stabilization on semi -arid sites 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 Tipi Mountain Native Plants <http://tmnp.tipimountain.com/> near Kimberley.
- 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 professional landscaper.
- Use transplant fertilizer (ie. Mykes Mycorrhizae Tree and Shrub or similar) as per manufacturers specifications in each planting hole.
- 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.).

Table 4. Recommended plant list

Common Name	Latin Name	Recommended Pot Size
<b>Shrubs</b>		
sitka alder	<i>Alnus crispa</i>	#1 or #2
red osier dogwood	<i>Cornus stolonifera</i>	#1 or #2
scoulers willow	<i>Salix scouleriana</i>	#1 or #2
sitka willow	<i>Salix sithencis</i>	#1 or #2
Douglas maple	<i>Acer glabrum</i>	#1 or #2
beaked hazlenut	<i>Corylus cornuta</i>	#1 or #2
nootka rose or prickly rose	<i>Rosa nootkana or Rosa acicularis</i>	#1 or #2
mallow ninebark	<i>Physocarpus malvaceus</i>	#1 or #2
Saskatoon	<i>Amelanchier almifolia</i>	#1 or #2
oceanspray	<i>Juniperus communis</i>	#1 or #2
Oregon grape	<i>Mahonia aquifolium</i>	#1 or #2
Lewis' mock orange	<i>Philadephus lewisii</i>	#1 or #2
common juniper	<i>Holodiscus discolor</i>	#1 or #2
common snowberry	<i>Symphoricarpos albus</i>	#1 or #2
<b>Perennials and grasses</b>		
bluebunch wheatgrass	<i>Pseudogenaria spicata</i>	4" or #1
junegrass	<i>Koeleria macrantha</i>	4" or #1
golden rod	<i>Solidago canadensis</i>	4" or #1

Common Name	Latin Name	Recommended Pot Size
shrubby penstemon	<i>Penstemon fruiticosa</i>	4" or #1
birch leaved spirea	<i>Spirea betulifolia</i>	4" or #1
common yarrow	<i>Achillea millefolium</i>	4" or #1
coral bells -	<i>Heuchera cylindrica</i>	4" or #1
old mans whiskers	<i>Geum triflorum</i>	4" or #1
golden aster	<i>Heterotheca villosa</i>	4" or #1
Canada goldenrod	<i>Solidago canadensis</i>	4" or #1
Elijah blue fescue	<i>Festuca glauca</i>	4" or #1
Karl Foerster feather reed grass	<i>Calamagrostis acutiflora</i>	4" or #1

Table 5. Recommended seed mix blend.

Dryland Erosion	% by species
Rocky Mountain fescue	27%
perennial ryegrass	13%
sheep fescue	27%
Annual ryegrass	8%
Creeping red fescue	10%
Canada bluegrass	10%

## 8 ENVIRONMENTAL MONITORING

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

- 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.
- QEP will prepare an environmental summary report and submit to the RDCK.

Further effectiveness monitoring of mitigation measures may also be required. The following indicators of success of riparian plantings should be documented:

- Plant composition includes only native plant species.
- Establishment of >80% of planted riparian species after 3 full years would be a reasonable indication that the mitigation plan has been successfully completed.

## 9 CONCLUSION

Overall, the mitigation plan as proposed will help mitigate most of the environmental impacts caused by inadvertent activities within the SPEA. The proposed development within the SPEA has caused loss of riparian habitat; however, as the restoration areas become established with native species, the riparian function will be improved and generally restored along the foreshore over time. If you have any comments or questions, please do not hesitate to contact the undersigned.

## 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.

Sincerely,



Fiona Lau, BTech., ASCT  
[fiona@masseenvironmental.com](mailto:fiona@masseenvironmental.com)

Reviewed by:



Sylvie Masse, MSc, RPBio  
Masse Environmental Consultants

## 11 REFERENCES

- [BC] Province of British Columbia. 2015. Riparian Areas Regulation. Victoria, British Columbia, Canada.
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- 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.
- [MOE] BC Ministry of Environment. 2014. Develop with Care. Province of British Columbia. Victoria, British Columbia, Canada.
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- [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 'A' Rural Official Community Plan Bylaw No. 2315, 2013.

**APPENDIX 1**  
**LOCATION MAP**



# 17140 Pilot Bay Road, Crawford Bay



October 27, 2022

**WARNING: MAP IS NOT PRINTED TO SCALE**

tilecache

GeoBC, DataBC, TomTom, © OpenStreetMap contributors

Cadastral data from ParcelMap BC  
Copyright 2022 LTSA

**APPENDIX 2**  
**PROPOSED SITE PLAN AND MITIGATION PLAN**

REFERENCE PLAN OF LOT 7  
DISTRICT LOT 4962  
KOOTENAY DISTRICT PLAN  
3065 AND ACCRETED LAND.  
Pursuant to Section 100(1)(a) of the Land Title Act.  
BCGS 82F.066

The intended plot size of this plan is  
560mm in width by 432mm in height  
(C size) when plotted at a scale of 1:400



LEGEND

Grid bearings are derived from GNSS observations and are referred to the central meridian of UTM Zone 11 North. The UTM coordinates and estimated absolute accuracy achieved are derived from Natural Resources Canada's Precise Point Positioning (PPP) service. This plan shows horizontal ground-level distances, unless otherwise specified. To compute grid distances, multiply ground-level distances by the combined scale factor of 0.9995212. The combined scale factor has been determined based on an ellipsoidal elevation of 506 metres.

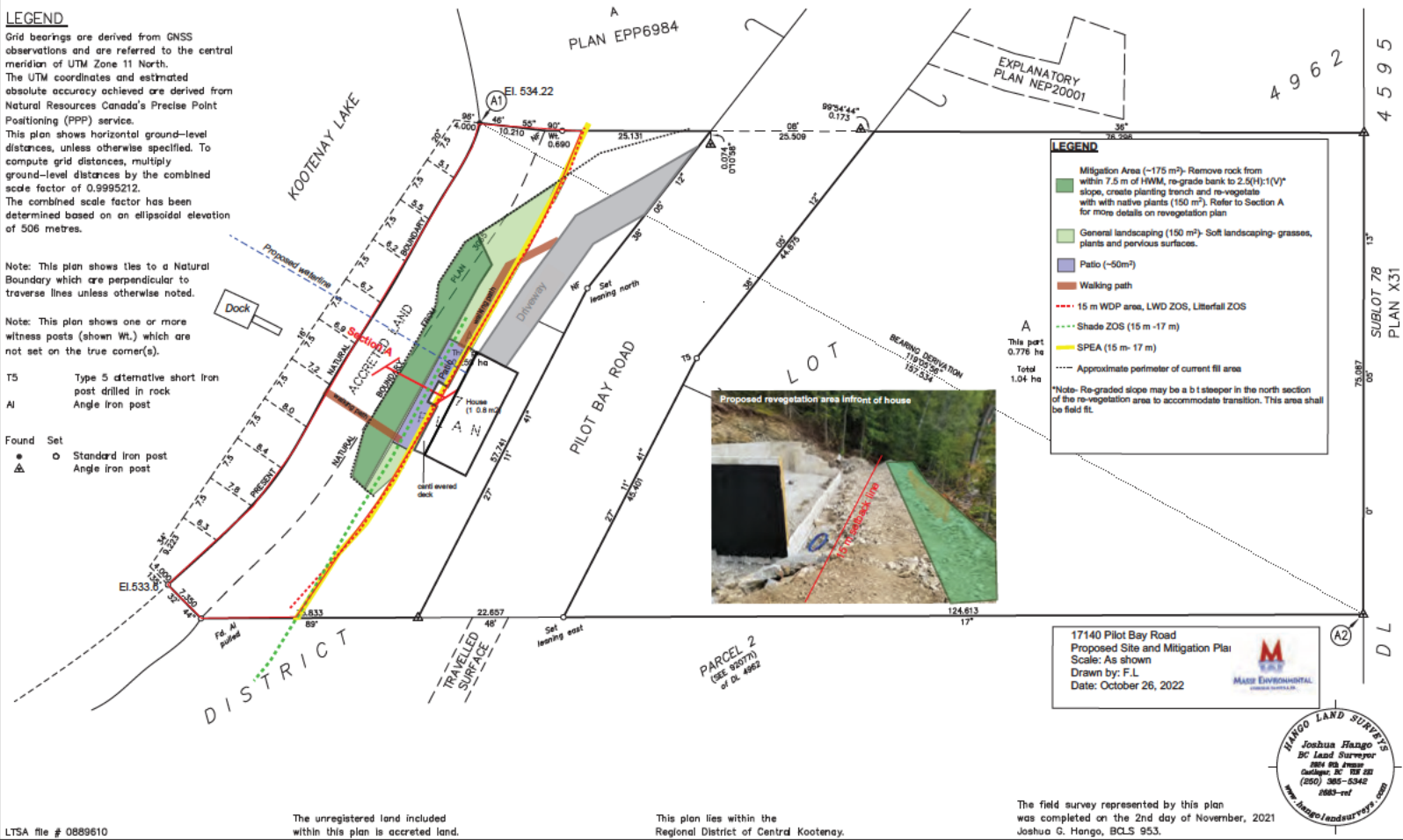
Note: This plan shows ties to a Natural Boundary which are perpendicular to traverse lines unless otherwise noted.

Note: This plan shows one or more witness posts (shown Wt.) which are not set on the true corner(s).

TS Type 5 alternative short iron post drilled in rock  
AI Angle iron post

Found Set  
● Standard iron post  
▲ Angle iron post

UTM NAD83 (CSRS) 2002.0 Zone 11	
IP A1	N 5501089.449 E 509152.667
Point combined factor: 0.9995212	
Absolute accuracy 0.04	
AI A2	N 5501012.875 E 509290.251
Point combined factor: 0.9995082	
Absolute accuracy 0.04	



**LEGEND**

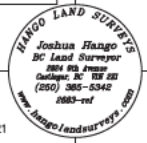
- Mitigation Area (~175 m<sup>2</sup>) - Remove rock from within 7.5 m of HWM, re-grade bank to 2.5(H):1(V)\* slope, create planting trench and re-vegetate with native plants (150 m<sup>2</sup>). Refer to Section A for more details on revegetation plan
- General landscaping (150 m<sup>2</sup>) - Soft landscaping- grasses, plants and porous surfaces.
- Patio (~50m<sup>2</sup>)
- Walking path
- 15 m WDP area, LWD ZOS, Litterfall ZOS
- Shade ZOS (15 m -17 m)
- SPEA (15 m -17 m)
- Approximate perimeter of current fill area

A  
This part  
0.778 ha  
Total  
1.04 ha

\*Note- Re-graded slope may be a bit steeper in the north section of the re-vegetation area to accommodate transition. This area shall be field fit.



17140 Pilot Bay Road  
Proposed Site and Mitigation Plan  
Scale: As shown  
Drawn by: F.L.  
Date: October 26, 2022



LTSA file # 0889610

The unregistered land included within this plan is accreted land.

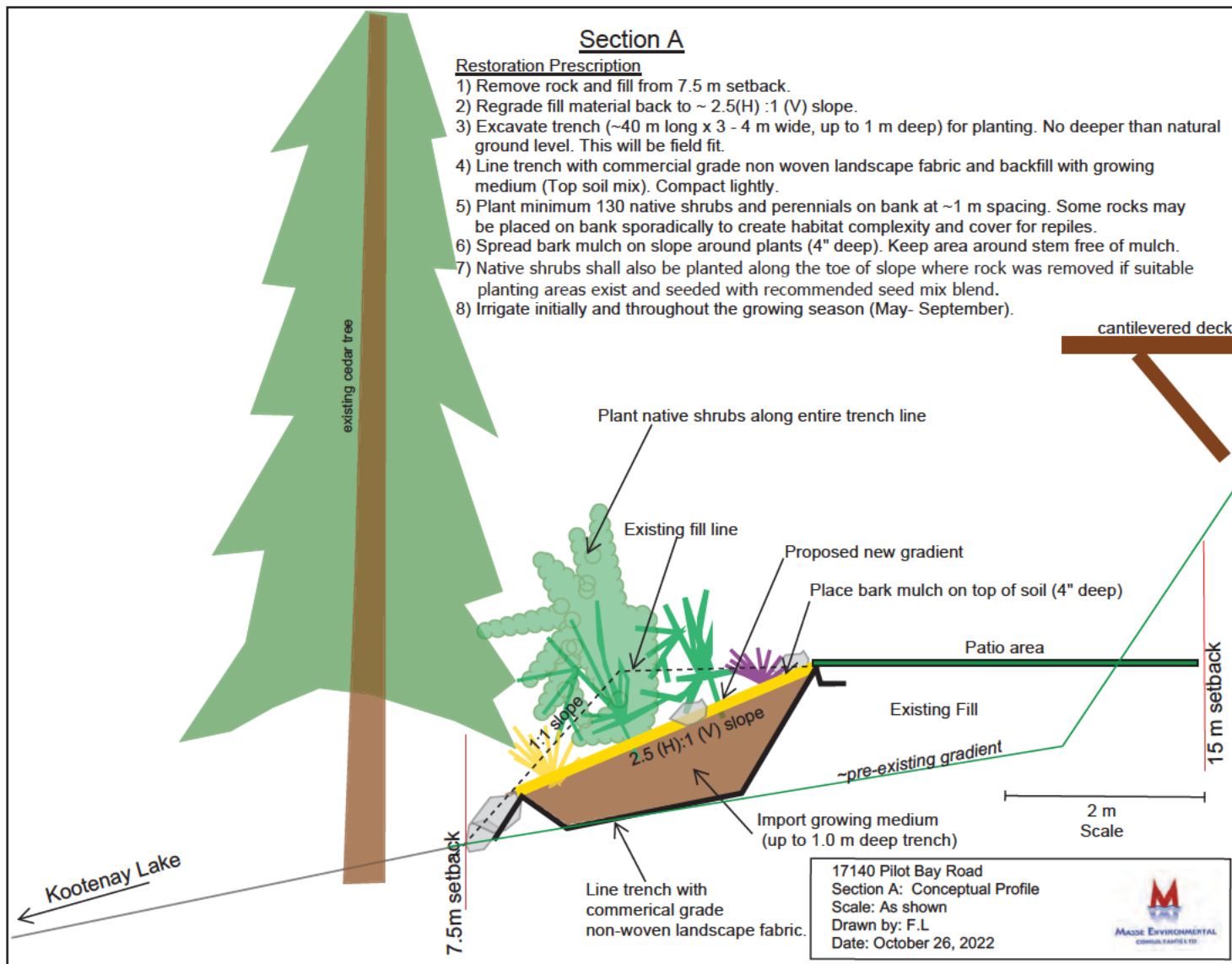
This plan lies within the Regional District of Centrd Kootenay.

The field survey represented by this plan was completed on the 2nd day of November, 2021  
Joshua G. Hango, BCLS 953.

## Section A

### Restoration Prescription

- 1) Remove rock and fill from 7.5 m setback.
- 2) Regrade fill material back to ~ 2.5(H) : 1 (V) slope.
- 3) Excavate trench (~40 m long x 3 - 4 m wide, up to 1 m deep) for planting. No deeper than natural ground level. This will be field fit.
- 4) Line trench with commercial grade non woven landscape fabric and backfill with growing medium (Top soil mix). Compact lightly.
- 5) Plant minimum 130 native shrubs and perennials on bank at ~1 m spacing. Some rocks may be placed on bank sporadically to create habitat complexity and cover for reptiles.
- 6) Spread bark mulch on slope around plants (4" deep). Keep area around stem free of mulch.
- 7) Native shrubs shall also be planted along the toe of slope where rock was removed if suitable planting areas exist and seeded with recommended seed mix blend.
- 8) Irrigate initially and throughout the growing season (May- September).



17140 Pilot Bay Road  
 Section A: Conceptual Profile  
 Scale: As shown  
 Drawn by: F.L  
 Date: October 26, 2022



**APPENDIX 3**  
**CHANCE FIND PROCEDURES**

## **Chance Find Procedures for Archaeological Material**

This document provides information on how a developer and/or their contractor(s) can manage for potential archaeological material discoveries while undertaking construction and/or maintenance activities. This document can provide assistance to in-field contractors in the identification of archaeological remains and the procedures to follow if a discovery is made. The discovery of human remains initiates a different course of action and is outlined separately.

Under the provincial *Heritage Conservation Act (HCA)*, archaeological sites that pre-date 1846 are automatically protected whether on public or private land. Protected sites may not be damaged, altered or moved in any way without a Section 12 or 14 Permit as issued through the *HCA*. It is illegal to collect or remove any heritage object from an archaeological site unless authorized to do so under permit.

### **1. Activities occurring outside of known Archaeological Sites:**

When archaeological material is encountered outside of known archaeological site areas work in the vicinity must stop immediately no matter what type of material or feature has been identified. Alteration to an archaeological site can only occur under a Section 12 (Site Alteration Permit) or Section 14 (Heritage Inspection Permit) *Heritage Conservation Act* permit. Such permit applications should be prepared by a professional archaeologist.

If archaeological material is discovered during the course of construction activities:

**1.1 Stop Work:** Halt all work in the area of the discovery and safely secure the area. Contact the project manager or site foreman.

**1.2 Contact an Archaeologist:** An archaeologist should be contacted as soon as possible. For a list of qualified archaeologists in the area, the proponent is directed to the BC Association of Professional Consulting Archaeologists website: [www.bcapa.ca](http://www.bcapa.ca). The proponent may also wish to contact the Ktunaxa Nation Council's Archaeology Technician Nathalie Allard for direction (1-250-426-9549; [nallard@ktunaxa.org](mailto:nallard@ktunaxa.org)).

**1.3 Archaeologist provides guidance:** The archaeologist will direct the proponent on the next courses of action, which will include notifying the Archaeology

Branch and First Nations with interest in the area.

## **2. Activities Occurring within Known Archaeological Site Boundaries:**

Land altering activity within a previously recorded archaeological site must be conducted under a Section 12 HCA Site Alteration Permit (SAP), in some cases with an onsite archaeological monitor. It is common for additional archaeological material and features to be encountered during activities occurring within previously recorded archaeological sites. Minor finds (lithic flakes, diffuse charcoal or fire altered rock) may not require work to stop, however significant finds require a level of assessment by a professional archaeologist, and it is up to the onsite project manager to determine the level of significance based on criteria presented below.

### **2.1 Significant Cultural Finds that Require a Professional Archaeologist (described in detail in Section 4)**

- Intact archaeological features, which can include but are not limited to hearths, cultural depressions (e.g. cache pits, house depressions) and rock alignments or forms (e.g. tipi rings, cairns, blinds)
- Significant archaeological materials, which include but are not limited to, the presence of formed lithic tools (e.g. projectile point, microblade core, scraper), a dense concentration of lithic waste flakes, or artistic items
- Human Remains (described in detail in Section 3)

### **2.2 Archaeological Site Management Options**

- 2.2.1 **Site Avoidance:** If the boundaries of a site have been delineated, redesign the proposed development to avoid impacting the site. Avoidance is normally the fastest and most cost effective option for managing archaeological sites. Site avoidance could also be achieved through minimizing ground disturbance by looking for alternative constructive methods.
- 2.2.2 **Mitigation:** If it is not feasible to avoid the site through project redesign, it is necessary to conduct systematic data collection and analysis within the site prior to its loss. This could include surface collection and/or excavation. This work can be time-consuming and therefore expensive to conduct.
- 2.2.3 **Protection:** It may be possible to protect all or portions of the site which will be impacted through installation of barriers during the development period and possibly for a longer period of time. Methods for barrier construction could include fencing around site boundaries or applying

geotextile to the ground surface and capping it with fill. The exact method used would be site-specific.

### **3. Chance Find Procedures for Identified Human Remains**

Procedures in the event of the discovery of human remains during construction are covered in depth by an Archaeology Branch Policy Statement, found on their website at [www.for.gov.bc.ca/archaeology](http://www.for.gov.bc.ca/archaeology), and are summarized below.

- 3.1 Stop all construction activities immediately in the area of found or suspected human remains and contact the RCMP and/or Office of the Coroner.
- 3.2 The coroner must determine whether the remains are of contemporary forensic concern or archaeological/aboriginal.
- 3.3 If the remains are found to be of aboriginal ancestry then the next step involves the relevant First Nations collaboratively determining the appropriate treatment of those remains.

The key to respectfully dealing with ancient aboriginal remains is to involve the appropriate First Nations as early as possible in the process. However this must be done in a manner that does not interfere with the coroner's office ability to conduct their business in the manner that they see fit.

### **4. Site Identification Guide**

The following are characteristics typical to site types found within the Ktunaxa Traditional Territory.

#### **4.1 Artifact Scatters**

Lithic (stone) scatters from the production and maintenance of stone tools are the most common type of archaeological site found in the region. Other materials that may be represented in artifact scatters are Fire Broken Rock (FBR), bone, antler and tooth.



Lithics: What to look for

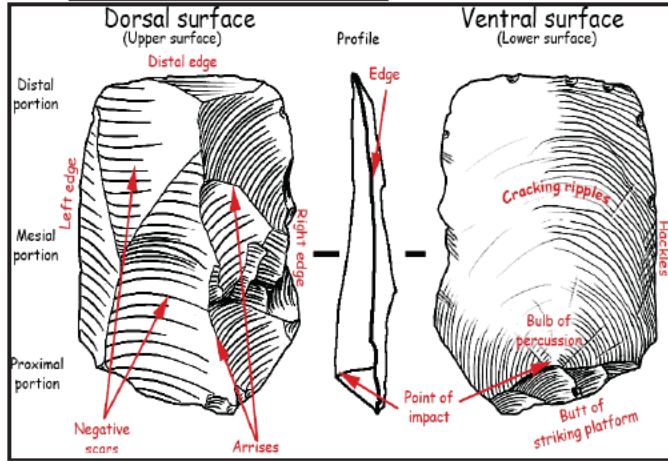


Image 1: Basic flake morphology



Image 2: Examples of lithic flakes

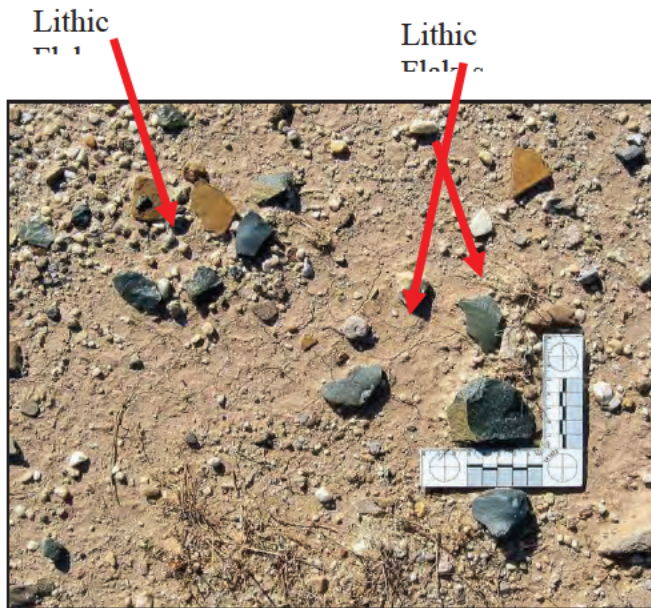


Image 3: Example of lithic scatter found on ground surface



Image 4: Example of formed lithic artifacts

*Zakisqnuak*

*Zaqam*

*Lower Kootenay*

*Tobacco Plains*



Image 5: Ground stone artifacts

Bone, Tooth and Antler Artifacts: What to Look For

- Obvious shaping
- Incising
- Unnatural holes



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*Lower Kootenay*

*Tobacco Plains*

## Image 6: Bone and Antler artifacts

### 4.2 Fire Broken Rock and Hearths

Fire-broken rock (FBR) results from the use of fire during cooking, heating and processing activities. FBR is often associated with other features including hearths and cultural depressions, but can also be thinly scattered in concentrations away from the features with which they were first associated.

When looking for FBR, note concentrations of roughly fractured rock from rapid heating and cooling, rock showing signs of burning or oxidation and/or reddening or blackening of surrounding matrix.



Image 7: Example of FBR; note the zig/zag pattern of breakage common to FBR. A hearth feature is evidence of a fire pit or other fireplace feature of any period. Hearths were used for cooking, heating, and processing of some stone, wood, faunal, and floral resources and may be either lined with a wide range of materials like stone or left unlined. Occasionally site formation processes (e.g., farming or excavation) deform or disperse hearth features, making them difficult to identify without careful study.

Hearths: What to look for

- FBR
- reddening or blackening of the associated soil/sediment
- charcoal
- layering of FBR and charcoal, and
- depressions in the earth associated with FBR, reddened or blackened matrix and charcoal.



Image 8: Example of a hearth uncovered along the wall of an excavation unit

#### 4.3 Cultural Depressions

Any depression seen on the ground surface that appears to have been excavated by man can be a cultural depression and have archaeological significance. These “pits” were dug for a variety of reasons such as for food storage, cooking or as a base for a dwelling.

They can range in size from 1m across to 7-10m across, and are usually found associated with other artifacts such as FBR and lithic scatters.

To identify a cultural depression, look for:

- Subtle to deep scours on the ground surface that are circular to rectilinear in shape
- A raised rim along the edge of a depression
- Depressions associated with artifacts and FBR
- Depressions associated with fire reddening and blackening of the matrix



Image 9: Example of a large cultural depression in a natural setting

#### 4.6 Rock Alignments

There are several types of rock alignments that occur within the culture area, which include tipi rings, medicine wheels, cairns and blinds. When attempting to identify rock alignments, look for a group of rocks that look purposefully placed as in a circle, pile or line; isolated groups of rock that do not seem to belong to that landscape; and/or rocks which form a pattern.



Image 10: Example of a Cairn or piling of rocks



Image 11: Example of a tipi ring in a natural setting

*Takisánuuk*

*Taq'am*

*Lower Kootenay*

*Tobacco Plains*