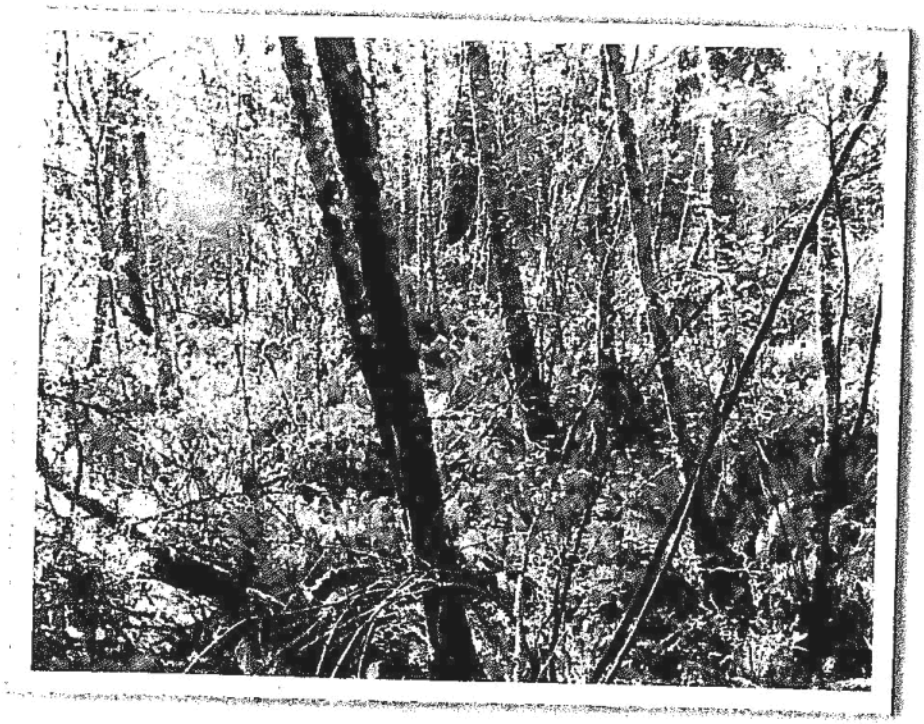
# Preliminary Ecological Site Investigation

LOT 1 SECTION 5 RANGE 3 WEST HIGHLAND DISTRICT
PLAN VIP70242



Prepared for: O.K. Industries Ltd.
Prepared by: Sarah Karkanis, M.Sc.
Wm. Patrick Lucey, M.Sc., R.P. Bio., CBiol, MSB
Tracy Motyer, B.Sc., R.B. Tech.

June 10, 2015

Aqua-Tex
Scientific Consulting Ltd. (1993)

## Background

Ok Industries recently purchased a parcel of land within the District of Highlands from the B.C. Provincial Government with the intent of undertaking phased aggregate mining and the potential future development of an Industrial Park. The District of Highlands Official Community Plan indicates that the subject property lies within Development Permit Areas for Water & Riparian Areas and Sensitive Vegetation and is zoned Greenbelt B2 (GB2) (District of the Highlands, 2013). While this property is zoned GB2, the land use designation within the OCP is commercial/industrial.

This parcel of land – Lot 1 Section 5 Range 3 West Highland District Plan VIP70242 (PID: 024-710-270) – is 26.3 hectares and is located in the District of the Highlands on Millstream Road. The property is bordered by the Tervita Highwest Engineered Landfill Disposal Facility (hazardous wastes) to the north and the Millstream Industrial Park to the south. This parcel also abuts a Capital Regional District septage site on its northwest boundary while the eastern property boundary borders Thetis Lake Regional Park (**Figure 1**). The western portion of the property abuts a private residential property, lying adjacent to Millstream Road.

Given the presence of historical septage facilities and the existence of the landfill to the north and heavy industrial activity to the south, a report prepared by Stevens Management in 2000 states that *"the potential for contamination at this site is relatively high"* (Stevens Management, 2000); however, this property received a Certificate of Compliance in 2010 deeming the property meets "Contaminated Sites Regulation standards for urban park land soil use and aquatic life and drinking water use and, Contaminated Sites Regulation criteria for freshwater typical sediment use" (B.C. Ministry of Environment, 2010).

Aqua-Tex Scientific Consulting Ltd. was retained to provide a preliminary site assessment and review of the existing ecological site features and their implications for development, in particular with respect to freshwater regulatory requirements (e.g. RAR). This ecological review is intended to provide a baseline for development planning.

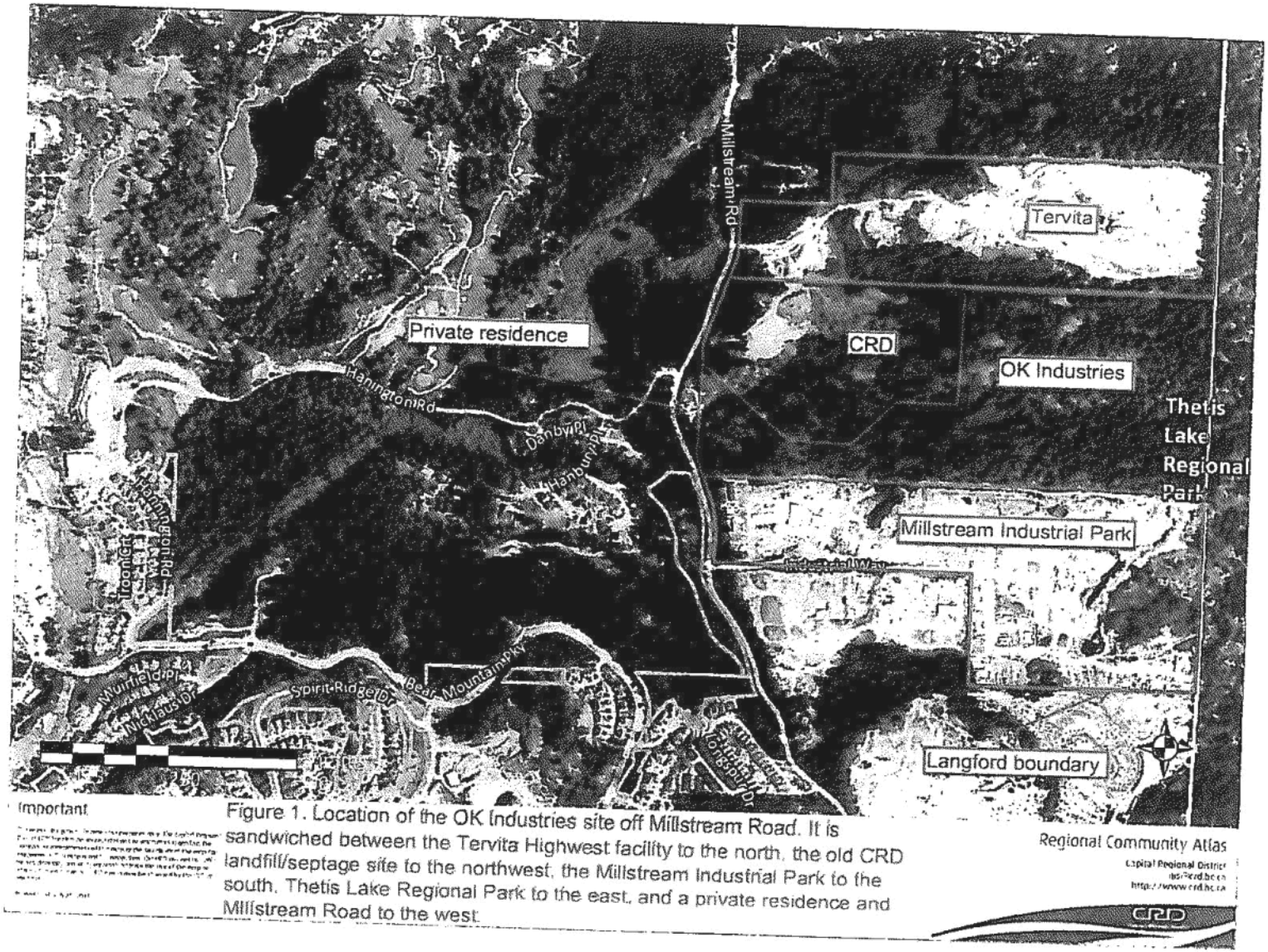



Figure 1. Location of the OK Industries site off Millstream Road. It is sandwiched between the Tervita Highwest facility to the north, the old CRD landfill/septage site to the northwest, the Millstream Industrial Park to the south, Thetis Lake Regional Park to the east, and a private residence and Millstream Road to the west.

## Methods

Both a desktop review of available background information and online mapping interfaces and a field site assessment were undertaken by Aqua-Tex as part of the preliminary ecological site investigation.

### Desktop Review

Previous site studies provided by O.K. Industries were reviewed along with exiting mapping databases such as Data BC viewed through Google Earth, CRD Regional Community Atlas, and the Conservation Data Centre iMap to identify ecological features that may be present on the subject property. A summary of this review is provided in the Findings section.

### Field Site Assessment

Given the size of the site (26.3 hectares), the assessment was conducted by walking transects using a grid-based model to ensure all major landscape features were visually observed and documented (e.g., riparian-wetland corridors, streams, isolated wetlands, rocky knolls, forest stand structures, roads, *et cetera*); subsequent site assessments were conducted to review off-site linkages with adjacent properties, including surface channel connections with Millstream Creek, and potential stormwater management buried pipe connections. The focus of the field assessment, conducted on April 28th, 2015, was to ground-truth the presence of ecological features identified in the desktop review stage. The assessment team started with a west-to-east transect on the northern property line, then a north-to-south transect through the eastern portion of the property, then a series of shorter south-to-north and north-to-south transects from the southern property line. A Garmin hand-held GPS unit was used to track the path of assessment and identify reference points (waypoints). Photographs were taken with a digital camera to document landscape characteristics and ecological features. Finally, off-site surveys were conducted to determine whether the larger wetland on the property is connected by surface drainage to Millstream Creek. An examination of the desktop mapping revealed no connection beyond the manmade pond on the adjacent property to the south (on the Industrial landscape)(**Figure 7**).

## Findings

### Desktop Mapping

The CRD Regional Community Atlas was reviewed for sensitive ecosystem polygons identified through the BC Ministry of Environment's (MOE) sensitive ecosystem inventory (SEI). This search resulted in the identification of four (4) SEI polygons (**Figure 2**): two woodland polygons, one wetland polygon, and one older second growth forest polygon. The following definitions of these SEI's are provided below:

**Woodlands**
Woodlands are open forested areas comprised of pure stands of Garry oak and mixed stands of Douglas-fir/Garry oak and Douglas-fir/arbutus. Remnant stands of trembling aspen are also found in wetter sites. Their understorey is characterized by a rich mosaic of wildflowers, grasses, shrubs and mosses.

Woodlands are found on south facing slopes of rocky knoll and bedrock dominated areas. The disturbance or soil conditions of such areas restrict the establishment of closed conifer forest and promote Garry oak regeneration. Woodlands also occur in combination with other ecosystems such as older Douglas-fir forest (OF), Older Second Growth Forest (SG) and Terrestrial Herbaceous (HT). (MOE, n.d. c)

**Wetland**
Wetland ecosystems are characterized by seasonal or year-round water, either at or above the soil surface or within the root zone of plants. They are found in areas of flat, undulating terrain and colder wetter climate.

Wetlands encompass a range of plant communities that includes western redcedar/skunk cabbage swamps, cattail marshes, *Sphagnum* moss dominated bogs and coastal salt marshes. (MOE, n.d. b)

**Older Forest**
Older Forest is defined as conifer-dominated forest with an average tree age of 100 years or greater. The trees are generally large and tall, reaching up to 1.5m in diameter and over 50m in height.

Older Forest is often found in combination with Older Second Growth Forest (SG) and occasionally with Terrestrial Herbaceous ecosystems (HT). Based on broad areas of similar climate and vegetation, two biogeoclimatic zones are recognized in this project:

1. Coastal Douglas-fir zone (CDF). At lower elevations (<150m). Douglas-fir is the dominant canopy tree in this southern portion of the study area. Low soil moisture conditions favour open stand structure and low growth of herbs, grasses and woody shrubs in the understorey.
2. Coastal Western Hemlock zone (CWH). At higher elevations, western hemlock is the dominant tree species in this northern portion of the study area. The forest floor is composed of a dense litter of needles and small branches. Cool, damp and acidic conditions favour a moss layer build up over time. (MOE, n.d. a)

The CRD Regional Atlas also shows a potential sharp-tailed snake (*Contia tenuis*) habitat polygon that covers a large portion of the subject property (**Figure 3**). Sharp-tailed snake is a red-listed species in BC and is Federally listed as endangered (Ministry of Water, Land, and Air Protection, 2004). The specific habitat needs of sharp-tailed snakes are unconfirmed but sites where the species do occur are

Coastal Douglas-fir ecosystems where Douglas-fir and arbutus are dominant vegetation species. Furthermore, "small forest openings with rocky substrate and a southern exposure are thought to provide egg-laying and nursery sites" (Ministry of Water, Land, and Air Protection, 2004, p.4).

The BC Conservation Data Centre (CDC) iMap was also reviewed to determine if there were any identified occurrences of sensitive ecological communities or species on this property. Two polygons were identified that encompassed a portion, or more, of the subject property (**Figure 4**). The first polygon covering the majority of the site is Shape ID 55772 representing the occurrence of the Douglas-fir/dull Oregon-grape ecological community, red-listed in B.C. The subject property is a small portion of this much larger polygon covering an area from Mount Finlayson to Thetis Lake (**Figure 5**). According to the CDC occurrence report, the condition of the occurrence is considered poor to fair given the young forest stand structure and its fragmentation from residential, urban, and industrial development (B.C. Conservation Data Centre, 2014). The second polygon, Shape ID 55880, is located on the northern edge of the site and identifies the area in which northern red-legged frogs (*Rana aurora*) have been observed (a blue-listed species in BC). Red-listed species and ecological communities are Extirpated, Endangered, or Threatened in British Columbia while blue-listed species and ecological communities are of Special Concern (formerly Vulnerable) (MOE, n.d. d).

Masked (i.e. not publicly available) occurrences with the shape ID's 9204, 9468, 30137, 41842, 44849 also show up on the B.C. Conservation Data Centre map; the CDC was contacted for additional information and they determined these masked occurrences were not relevant to this property (K. Stipec, personal communication, May 7, 2015).

Lastly, GeoBC and DataBC maps were viewed through Google Earth to identify watercourses, water bodies, and other aquatic features that may exist on the subject property. These maps were compared to the CRD Regional Community Atlas watercourse layer and to existing reports including the Craigflower Watershed Assessment prepared by SHIP Environmental Consultants Ltd. in 1997. Only one watercourse was mapped traversing the subject property, Teanook Creek. Teanook Creek is located on the northern boundary of the subject property and flows from Teanook Lake into McKenzie Lake (**Figure 6**). Teanook Creek watershed is a subcatchment of the much larger Craigflower Creek watershed. A search through the Ministry of Environments FISS database revealed that there is no recorded fish presence in Teanook Lake but there are fish present in McKenzie Lake including brown catfish, cutthroat trout, and threespine stickleback (MOE, 2015). Previous site studies identified a large wetland near the centre of the site and a small drainage into Millstream Creek at the south-west corner of the site (**Figure 6**).

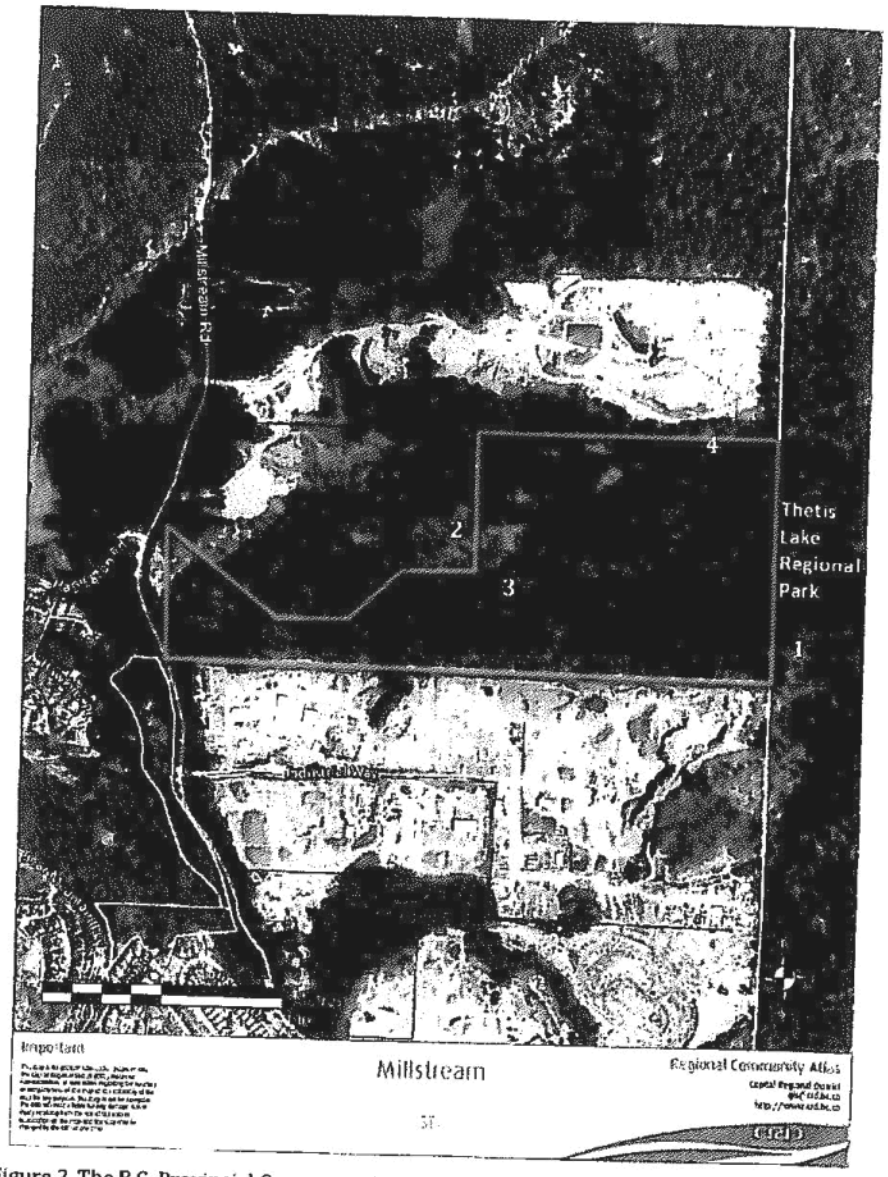



Figure 2. The B.C. Provincial Government Sensitive Ecosystem Inventory (SEI) mapping project identifies four SEI polygons on the subject property (thick red outline). The pink polygons represent woodlands (1 & 2), the green polygon (3) represents a wetland, and the brown polygon (4) represents older second growth forest.

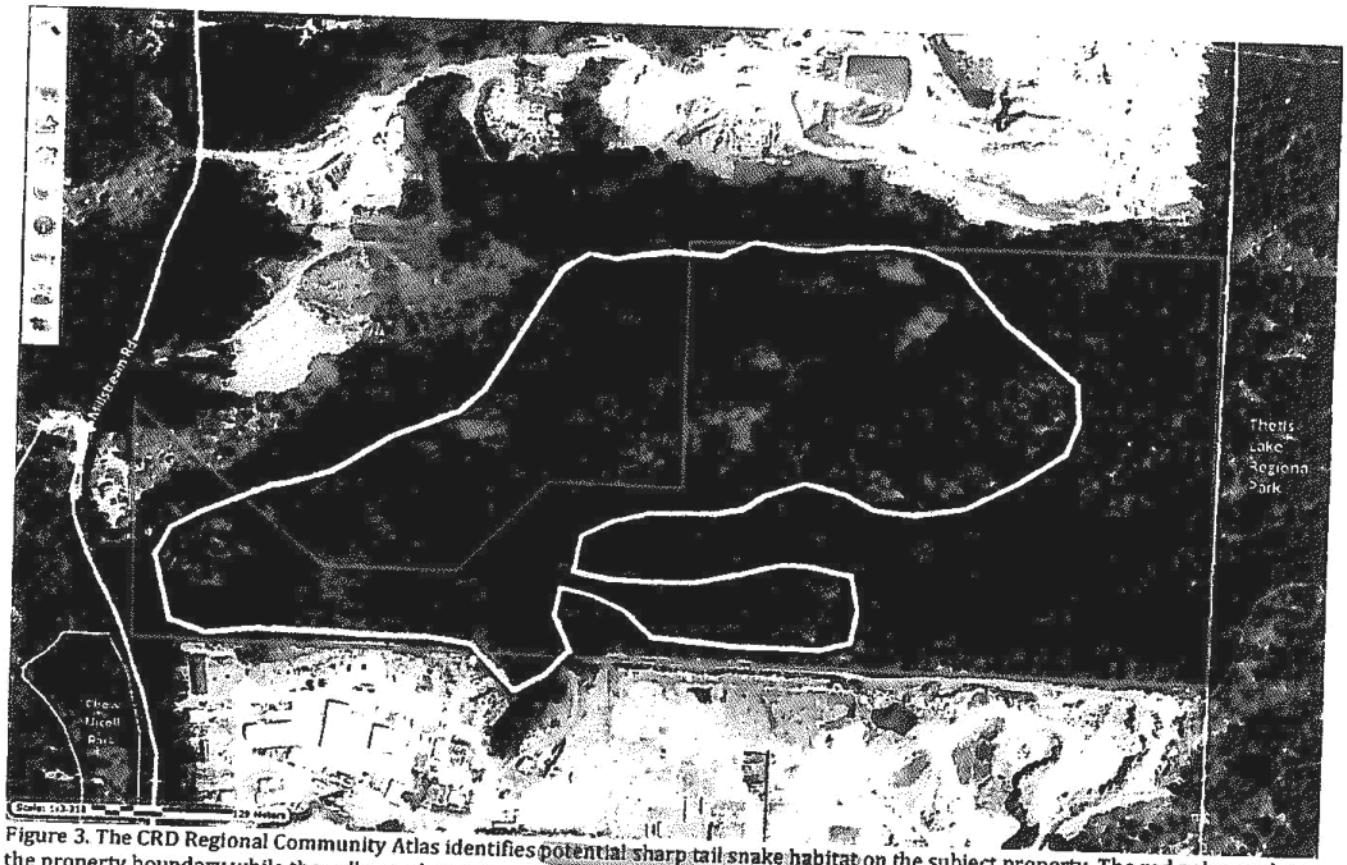



Figure 3. The CRD Regional Community Atlas identifies potential sharp tail snake habitat on the subject property. The red polygon shows the property boundary while the yellow polygon identifies the potential sharp tail snake habitat.

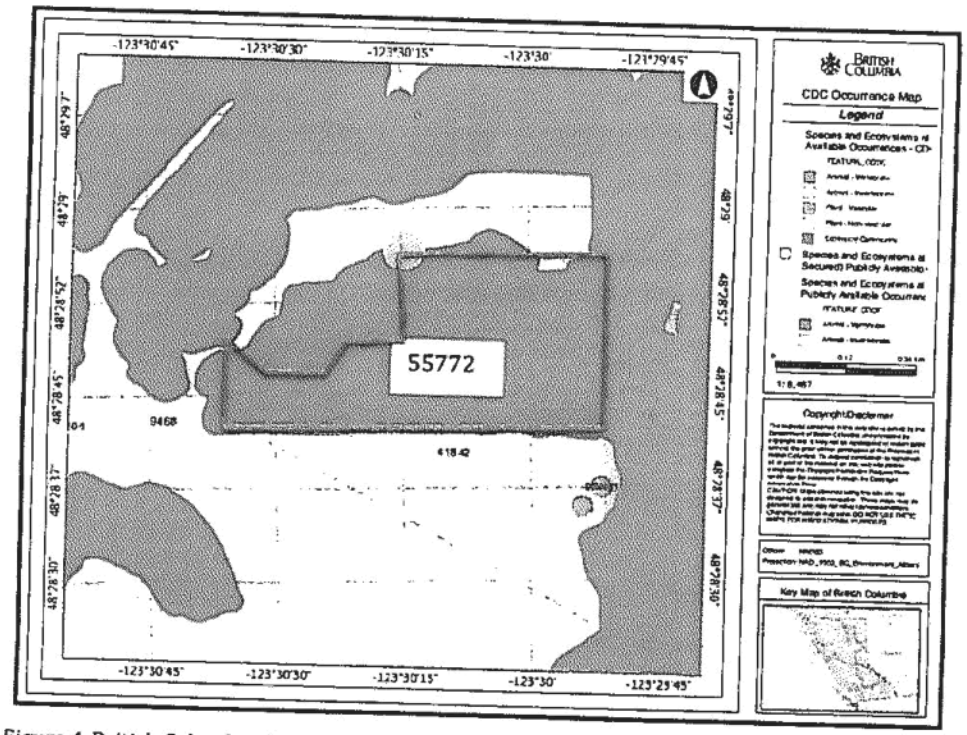



Figure 4. British Columbia Conservation Data Centre (CDC) occurrence map for sensitive species and ecosystems. The blue polygon labeled 55772 covers the subject property (red polygon approximately) and represents the Douglas-fir/dull Oregon-grape red-listed ecological community. The subject property is part of a much larger polygon that covers an area from Mount Finlayson to Thetis Lake (Figure 5). The yellow polygon sits on the northern boundary of the subject property and identifies the occurrence of red-legged frog, a blue-listed species.

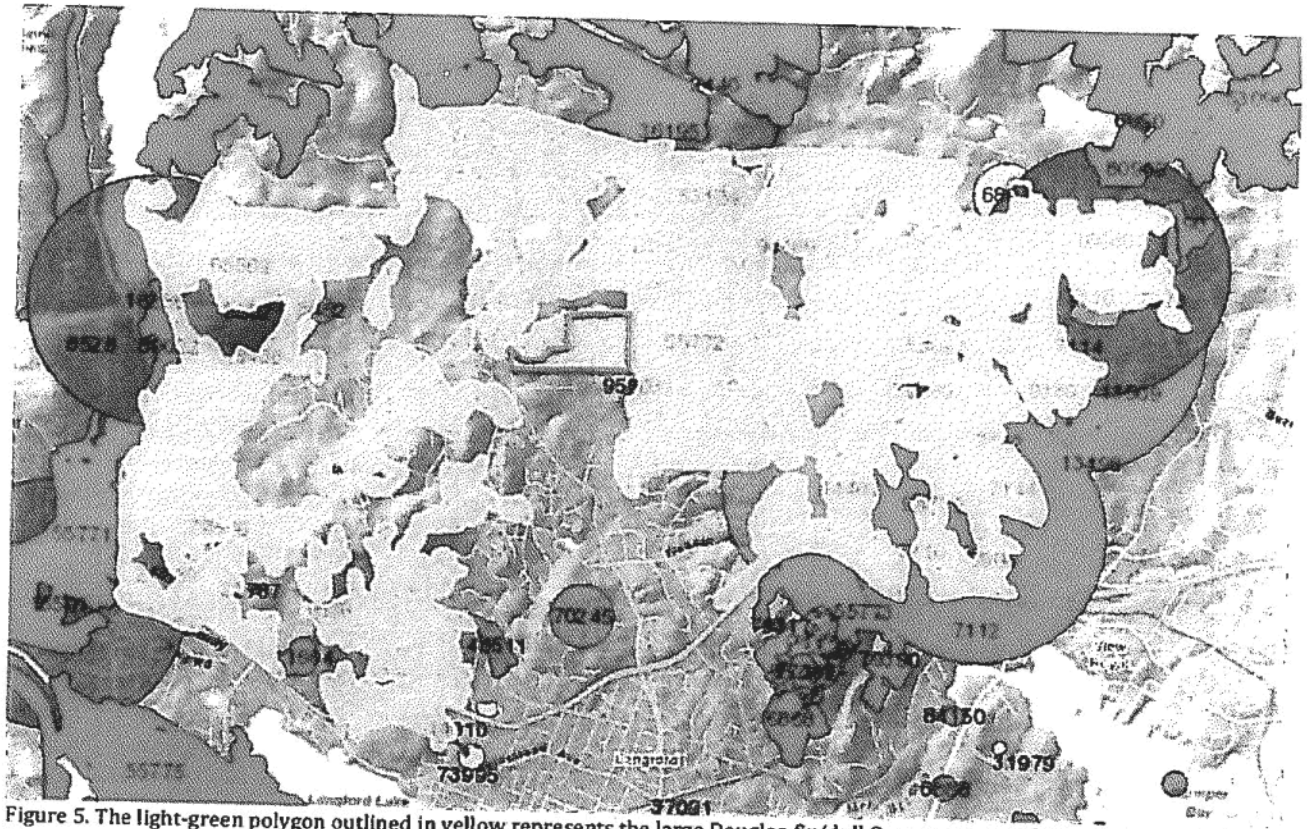


Figure 5. The light-green polygon outlined in yellow represents the large Douglas-fir/dull Oregon-grape polygon that exists in this region. The approximate boundary of the subject property is in red. Image Source: CDC iMap.

Figure 6. Google Earth map showing GeoBC (DataBC) water features in the vicinity of the subject property (red polygon). Teanook Creek is located along the north-east portion of the property. This stream is part of the Craigflower Creek Watershed and flows into McKenzie Lake. Old site maps indicate the presence of a large wetland and associated drainage near the centre of the site (yellow polygon) along with a small drainage at the south-west corner (yellow line).

Figure 7. Online mapping systems show no connection between the man-made pond on the Industrial property and Millstream Creek. Image Source: Google Earth.

Field Findings

A full day site assessment was undertaken by Aqua-Tex Scientific on Monday, April 20th, to determine the ecological characteristics of the subject property with a particular focus on freshwater ecology. During the assessment, Aqua-Tex located four different freshwater features:

- Teanook Creek,
- An isolated wetland on the southern property line,
- A large wetland complex near the centre of the site, and
- A wetland and stream channel on the southwest corner of the property (see Ecological Features Site Map).

*Teanook Creek*

Teanook Creek is located along the northern property boundary of the subject property. The north bank of the stream abuts the Tervita Highwest facility; in some locations, the toe of the fill slope on that property is the northern bank of the creek. For the length of the property Teanook Creek resides in the bottom of a small ravine with the land rising up as the fill slope to the north and a natural, vegetated hillside to the south. This freshwater system is a series of connected wetlands that encompass the ravine bottom; the riparian-wetland functions as a broad floodplain, with the stream moving through as a meandering channel. The stream channel is a mix of single thread and braided channels along the gradient of the wetland. The riparian-wetland within the ravine has a shallow slope (<2%), with dense riparian vegetation. Numerous cedar stumps were observed attesting to a former cedar dominated wetland within the ravine. There is one short segment, at the eastern end of the property, with no floodplain and a waterfall through bedrock and cobble; this short reach has a steeper gradient (>6%).

Channel widths were measured periodically and ranged from 1.5m to 3m with extensive active floodplain up to approximately 20m wide or more. In the areas with extensive floodplain/wetland, western redcedar, red alder, bigleaf maple, salmonberry, skunk cabbage, and Pacific water parsley dominate the riparian vegetation (**Table 1** provides a detailed list of vegetation). Two small tributaries, both dry at the time of assessment, flow into Teanook Creek from the south bank. Both tributaries are associated with a cluster of western redcedar at their upper limits. One large nest and a wildlife tree, with heavy woodpecker activity, were observed at the upper end of the second (eastern) tributary. A northern red-legged frog (blue-listed species) was seen at the top of the waterfall confirming the applicability of the CDC polygon shape ID #55880. A modified western redcedar with a hunting blind/tree fort was noted downstream of the waterfall.

Despite the industrial activity to the north, and historical land uses on the subject property, Teanook Creek has the hydrological, vegetation, and erosion/deposition characteristics that result in its being a properly functioning and healthy creek. While we did not conduct a Proper Functioning Condition assessment, our field

observations suggest the stream and its riparian-wetlands would, if such an aquatic health diagnosis was conducted, receive a high functional rating.

Table 1. Vegetation along Teanook Creek. Exotic species marked with an asterisk (*).

| Common Name | Latin Name |
|---|---|
| bigleaf maple | *Acer macrophyllum* |
| vanilla-leaf | *Achlys triphylla* |
| red alder | *Alnus rubra* |
| arbutus | *Arbutus menziesii* |
| lady fern | *Athyrium filix-femina* |
| common horsetail | *Equisetum arvense* |
| salal | *Gaultheria shallon* |
| oceanspray | *Holodiscus discolor* |
| English holly* | *Ilex aquifolium* |
| skunk cabbage | *Lysichiton americanum* |
| dull Oregon-grape | *Mahonia nervosa* |
| Pacific water parsley | *Oenanthe sarmentosa* |
| shore pine | *Pinus contorta* var. *contorta* |
| sword fern | *Polystichum munitum* |
| Douglas-fir | *Pseudotsuga menziesii* |
| Nootka rose | *Rosa nutkana* |
| Himalayan blackberry* | *Rubus armeniacus* |
| salmonberry | *Rubus spectabilis* |
| willow species | *Salix* sp. |
| red elderberry | *Sambucus racemosa* ssp. *pubens* |
| Western redcedar | *Thuja plicata* |
| stinging nettle | *Urtica dioica* |
| red huckleberry | *Vaccinium parvifolium* |

*Isolated Wetland on Southern Property Boundary*

A small, isolated wetland is located on the southern property line approximately 300 metres from the south-east corner of the property (see Ecological Features Site Map). This small wetland covers an approximate area of 300m² with its southern boundary at the toe of the Millstream Industrial Park road. The wetland appears to be receiving its water from the surrounding hillside while the road acts as a berm along its southern edge. No culvert outlet was found, with the elevated road-base acting as a physical barrier to off-site flow; this small wetland is classified as an isolated, perched wetland. The vegetation in this wetland is dominated by red-osier dogwood and hardhack (see **Table 2** for detailed list of vegetation).

Table 2. Isolated wetland vegetation. Exotic species marked with an asterisk (*).

| Common Name | Latin Name |
|---|---|
| agromonic grasses* | |
| arbutus | *Arbutus menziesii* |
| red-osier dogwood | *Cornus stolonifera* |
| Scotch broom* | *Cytisus scoparius* |
| salal | *Gaultheria shallon* |
| oceanspray | *Holodiscus discolor* |
| shore pine | *Pinus contorta* var. *contorta* |
| Douglas-fir | *Pseudotsuga menziesii* |
| Nootka rose | *Rosa nutkana* |
| Himalayan blackberry* | *Rubus armeniacus* |
| trailing blackberry | *Rubus ursinus* |
| willow species | *Salix* sp. |
| hardhack | *Spirea douglasii* ssp. *douglasii* |

*Wetland Complex at the Centre of the Site*

The CRD Regional Community Atlas identified a wetland SEI polygon near the centre of the subject property. The field assessment confirmed the presence of this large wetland and identified an outlet on its southern edge that flows south underneath a perimeter road. No culverts were observed at the outlet under the road; it appears water flows through the large angular rock that forms the roadbase. The flows from the wetland, having percolated through the roadbase are stored in a large, manmade pond on the adjacent property (still within the District of Highlands). Anecdotal conversation with a management staff member of the Industrial Park, indicated there is no outlet from the pond; during prolonged, heavy rainstorms the pond periodically over-flows its bank and flows across the industrial landscape. The pond is used for fire suppression at Millstream Industrial Park. The assessment team requested a review of the drainage information from the Engineering department at the City of Langford who confirmed that there is no official record of connecting drainage. Another unmapped arm of this wetland complex was located between two rocky knolls to the west of the SEI wetland. This wetland connects through a small channel to the main wetland complex just downstream of the old road.

The large wetland at the north of this complex is dominated by hardhack, red-osier dogwood, and willow sp.. Black cottonwood, oceanspray, salal, sword fern, and Douglas-fir border the wetland upslope. One large Douglas-fir is growing within the wetland itself. This is an unusual location for a Douglas-fir as they prefer drier soil conditions and suggests that the wetland may be larger than it used to be, perhaps because of the construction of the road downstream which functions as a dam. A hummingbird was observed in this area but moved on too quickly for identification.

The vegetation of the western wetland of this complex is dominated by western redcedar and skunk cabbage while the wetland at the southern end of the complex

is dominated by willow, skunk cabbage, Pacific water parsley, rushes and oceanspray. For a detailed list of vegetation for this wetland complex see **Table 3.**

Field investigations failed to find a culvert system, or any other path, connecting this wetland complex to Millstream Creek.

Table 3. Wetland Complex in the Centre of the Site. Exotic species marked with an asterisk (*).

| Common Name | Latin Name |
|---|---|
| bigleaf maple | *Acer macrophyllum* |
| red alder | *Alnus rubra* |
| arbutus | *Arbutus menziesii* |
| lady fern | *Athyrium filix-femina* |
| deer fern | *Blechnum spicant* |
| red-osier dogwood | *Cornus stolonifera* |
| Scotch broom* | *Cytisus scoparius* |
| salal | *Gaultheria shallon* |
| oceanspray | *Holodiscus discolor* |
| skunk cabbage | *Lysichiton americanum* |
| Pacific water parsley | *Oenanthe sarmentosa* |
| Pacific ninebark | *Physocarpus capitatus* |
| shore pine | *Pinus contorta var. contorta* |
| sword fern | *Polystichum munitum* |
| black cottonwood | *Populus balsamifera ssp. trichocarpa* |
| Douglas-fir | *Pseudotsuga menziesii* |
| bracken fern | *Pteridium aquilinum* |
| Nootka rose | *Rosa nutkana* |
| Himalayan blackberry* | *Rubus armeniacus* |
| trailing blackberry | *Rubus ursinus* |
| willow species | *Salix* sp. |
| hardhack | *Spirea douglasii ssp. douglasii* |
| Western redcedar | *Thuja plicata* |

*Wetlands and Stream Channel at the Southwest Corner of the Site*

A wetland complex is located on the CRD property along the southwest border with the subject property. These wetlands are dominated by shrubby species such as hardhack, willow, and red-osier dogwood and appear to have been created and/or modified in the past by the creation of roads.

An old stream channel was observed between the wetlands mentioned above and the pool mentioned below. There was no evidence of any flow this year but pooling water was present. If flows occur in this stream they would be routed to the southwest.

Further to the west down an old road, a pool marks the upstream end of an unnamed tributary to Millstream Creek. This stream flows adjacent to and south of the old road, then flows beside the driveway of the private residence on Millstream Road. The stream channel is routed under Millstream Road in a small culvert and down the slope to Millstream Creek; the culvert outlet was almost completely blocked with debris and soil, suggesting minimal flows pass through the culvert. The bank immediately below the culvert outlet did not provide any visual evidence of a stream channel, indicating the minimal flows from this culvert are absorbed by the forest floor and there may not be a direct, surficial connection with Millstream Creek (see the Ecological Features Site Map). Confirmation that this aquatic landscape unit is connected by surficial flow to Millstream Creek will need to be verified during winter rains.

The vegetation along this unnamed tributary is dominated by western redcedar and sword fern. A full list of vegetation for the wetland and stream channel at the western corner of the site is found in **Table 4**.

Table 4. Vegetation list for the wetlands and stream channel at the western corner of the site. Exotic species marked with an asterisk (*).

| Common Name | Latin Name |
|---|---|
| bigleaf maple | *Acer macrophyllum* |
| vanilla-leaf | *Achlys triphylla* |
| red alder | *Alnus rubra* |
| red-osier dogwood | *Cornus stolonifera* |
| Scotch broom | *Cytisus scoparius* |
| daphne* | *Daphne laureola* |
| skunk cabbage | *Lysichiton americanum* |
| dull Oregon-grape | *Mahonia nervosa* |
| sword fern | *Polystichum munitum* |
| Douglas-fir | *Pseudotsuga menziesii* |
| willow species | *Salix* sp. |
| hardhack | *Spirea douglasii* ssp. *douglasii* |
| common snowberry | *Symphoricarpos albus* |
| western redcedar | *Thuja plicata* |
| stinging nettle | *Urtica dioica* |

*General Terrestrial Site Character*

This site is forested with a second growth canopy of approximately 30-50 years old and lies within the Coastal Douglas-fir Biogeoclimatic zone, Moist Maritime variant (CDFmm). South of Teanook Creek the elevation rises up considerably from 70m to about 100m with a rolling landscape of bedrock knolls. Old logging roads and trails exist throughout the site.

The vegetation is dominated by Douglas-fir, arbutus, oceanspray, salal, and dull Oregon-grape. This dominant vegetation is consistent with the description of the Douglas-fir/dull Oregon-grape ecological community (CDC polygon shape ID #5772) (Wartigg, 2010). A list of all vegetation observed during the assessment is provided in **Table 5.**

The locations and existence of the SEI polygons were confirmed. The woodland polygon on the southeast corner of the property is present but it is no longer connected to rest of the polygon to the south due to a road and gravel storage area associated with Millstream Industrial Park. The large SEI woodland polygon in the middle of the site is a large rocky knoll with a thick canopy of arbutus, an understory of oceanspray, and an herb layer of few-flowered shooting star. The south side of this rocky knoll may be suitable habitat for sharp-tailed snake.

Table 5. Vegetation observed during the site assessment. Exotic species marked with an asterisk (*).

| Common Name | Latin Name |
|---|---|
| agronomic grasses | |
| moss | |
| grand fir | *Abies grandis* |
| bigleaf maple | *Acer macrophyllum* |
| vanilla-leaf | *Achlys triphylla* |
| red alder | *Alnus rubra* |
| arbutus | *Arbutus menziesii* |
| lady fern | *Athyrium filix-femina* |
| deer fern | *Blechnum spicant* |
| sedges | *Carex* sp. |
| small-flowered blue-eyed mary | *Collinsia parviflora* |
| red-osier dogwood | *Cornus stolonifera* |
| English hawthorn* | *Crataegus mongyna* |
| Scotch broom* | *Cytisus scoparius* |
| Daphne* | *Daphne laureola* |
| few-flowered shooting star | *Dodecatheon pulchellum* |
| common horsetail* | *Equisetum arvense* |
| cleavers | *Galium aparine* |
| salal | *Gaultheria shallon* |
| oceanspray | *Holodiscus discolor* |
| English holly* | *Ilex aquifolium* |
| rushes | *Juncus* sp. |
| skunk cabbage | *Lysichiton americanum* |
| dull Oregon-grape | *Mahonia nervosa* |
| Pacific water parsley | *Oenanthe sarmentosa* |
| pacific ninebark | *Physocarpus capitatus* |
| shore pine | *Pinus contorta var. contorta* |

| | |
|---|---|
| sea blush | *Plectritis congesta* |
| sword fern | *Polystichum munitum* |
| black cottonwood | *Populus balsamifera ssp. trichocarpa* |
| Douglas-fir | *Pseudotsuga menziesii* |
| bracken fern | *Pteridium aquilinum* |
| Nootka rose | *Rosa nutkana* |
| Himalayan blackberry* | *Rubus armeniacus* |
| salmonberry | *Rubus spectabilis* |
| trailing blackberry | *Rubus ursinus* |
| willow | *Salix* sp. |
| red elderberry | *Sambucus racemosa ssp. pubens* |
| hardhack | *Spirea douglasii ssp. douglasii* |
| common snowberry | *Symphoricarpos albus* |
| western redcedar | *Thuja plicata* |
| stinging nettle | *Urtica dioica* |
| red huckleberry | *Vaccinium parvifolium* |

Ecological Features Site Map

Page 21

Withheld pursuant to/removed as

Copyright

## Regulations, Policies, and Guidelines

### Federal Government

The Sharp-tailed snake is federally listed as an endangered species and is, therefore, federally protected under Species at Risk Act (SARA). According to the SARA public registry, *"all known localities of the snake are on private land, which are not subject to any habitat protection requirements. The Wildlife Act of British Columbia prohibits the collection, handling and trade of all native wildlife species without a permit; but does not provide habitat protection"* (Government of Canada, 2015).

### BC Provincial Government

#### *Riparian Area Regulation*

The Riparian Areas Regulation (RAR) is applicable to any watercourse(s) (streams, rivers, creeks, ditches, ponds, lakes, springs, and wetlands) that is/are connected by surface flow to a waterbody that provides fish habitat. Under the regulation, if a watercourse is present within 30 metres of a proposed development, a Qualified Environmental Professional (QEP) is required to follow a specific method to determine a setback or buffer to protect the stream and its riparian zone. With respect to the subject property, the RAR is applicable to Teanook Creek and may be applicable to the Unnamed Tributary to Millstream Creek in the southwest corner of the property.

#### *Sensitive Ecosystem Inventory Conservation Guidelines*

The Ministry of Environment has developed management recommendations for SEI's on East Vancouver Island & Gulf Islands (see MOE, n.d., d). Where land development activities cannot be excluded from these areas they recommend the proponent work with a qualified environmental professional "to incorporate designs that are sensitive to the natural ecosystem, clearly delineating sensitive areas prior to and during construction and minimizing impacts to the core ecosystem's" (MOE, n.d., d). The proponent is currently working with Aqua-Tex to address this guideline.

#### *Guidelines for Provincially Listed Species*

Provincially listed species, such as the sharp-tailed snake and northern red-legged frog, are protected under the Wildlife Act of British Columbia that prohibits the collection, handling and trade of all native wildlife species without a permit. The Act does not require habitat protection for these species on privately owned land. The Wildlife Act does protect active birds nests and nests of eagles, peregrine falcons, gyrfalcons, osprey, heron, or burrowing owl.

There are no provincial regulations that dictate the protection of listed ecological communities on private land; however, they encourage land stewardship and best management practices through guideline documents such as *Develop with Care* (MOE, 2014). The proponent has been working with Aqua-Tex to consider the

ecological values of this site while keeping in mind the desired commercial/industrial land use as described in the District of Highlands OCP.

*Section 9 of the Water Act*

Any changes in or about a stream, for example, the installation of a culvert, requires the submission of a Section 9 notification or application to the Ministry of Forests, Lands, and Natural Resource Operations for authorization.

District of the Highlands

Based on the preliminary site assessment there are two development permit areas that are applicable to ecological features on this property (see **Figure 11** for setbacks & protected areas as per Highland requirements): Development Permit Area No. 2 and Development Permit Area No. 3. However, the OCP also indicates that this area is intended for commercial/industrial development. To accommodate this desired land use, the DP guidelines (copied below) cannot practically be accomplished.

*Development Permit Area No. 2 – Water and Riparian Areas*

Two areas of the site are designated by the District of Highlands as water and riparian DP areas, the large wetland in the centre of the site and the Unnamed Tributary to Millstream Creek in the southwest corner of the property (**Figure 9**). This DP area is applied to the water feature as well as areas within 30m of the top of bank or natural boundary. Given this definition, all the freshwater features identified during the preliminary site assessment meet the criteria for this DP area even though not all of them are subject to the RAR. The guidelines for these areas as described by the District of Highlands are below:

1. No unnecessary site disturbances shall be permitted within at least 30 metres (100 feet) of the top of bank of watercourses, or the natural boundary of lakes, wetlands, and other water features. Existing vegetation shall be maintained in order to control erosion, protect banks, protect habitat, and retain the natural character of water features. Outside agencies, such as Department of Fisheries and Oceans and BC Ministry of Environment, will be consulted where necessary.
2. No habitable buildings or other structures requiring foundations will be constructed, and no septic tanks or fields will be installed within at least 30 metres (100 feet) horizontal distance from the top of a bank of a watercourse or high water mark of water features, and within 15 metres (50 feet) horizontal distance of the natural boundary of an area subject to flooding.
3. Provision will be made and works undertaken to maintain the quality of stormwater flowing toward or in the identified water features, and to ensure that the volume and peak flow of runoff from a property is not increased by any development or land altering activity.
4. Vegetation appropriate and preferably indigenous to the site may be required to be planted on the site to reduce erosion risk, restore and enhance the natural character of the site, improve water quality, or to stabilize slopes and banks. A landscaping security deposit will be required to encourage

compliance. Outside agencies, such as Department of Fisheries and Oceans and BC Ministry of Environment, will be consulted where necessary.

5. Removal of gravel, sand, soil or peat from streambeds, lakes, or wetlands and the draining, dredging, infilling, piping or dumping of materials will be strictly limited. Outside agencies, such as Department of Fisheries and Oceans and BC Ministry of Environment, will be consulted where necessary.
6. Modification of channels, banks, or shores that could cause environmental harm or significantly alter local hydrological conditions will not be permitted.
7. Pollutants, including pesticides and fertilizers, will be prevented from entering water features or wetlands by requiring the control of surface water drainage.
8. All new developments or modifications of existing developments will be required to prove to the satisfaction of the District of Highlands that the development will cause no increase in runoff compared to existing conditions of the site.
9. Non-point source pollution will be prevented from entering water features from residential or commercial developments or agricultural activities.
10. Facilities to allow the use of gasoline powered boats and floatplanes will not be allowed.
11. The Development Permit may designate and specify where necessary, a buffer zone within which land alteration or structures will be limited to those compatible with the characteristics of the water feature.
12. Development Permits issued with regard to road and driveway construction in this area will ensure that:
    a. Watercourse crossings are so located as to minimize disturbance of water feature banks, channels, shores, and vegetation cover.
    b. Bridges are used instead of culverts for crossings of fish-bearing watercourses, wherever possible.
    c. Where culverts are used, their size will be large enough to accommodate 100-year flood conditions. Culverts should be placed to allow unrestricted movement of fish in both directions. Where desirable, culverts may be designed to retard low flows and encourage instream storage of water.

    In-stream work requires notification or approval under section 9 of the Water Act.
13. Watercourses should be left natural to protect habitat.
14. Should any application for changes to land within Highlands fall within the parameters of the BC Riparian Areas Regulation (RAR), an applicant will be required to furnish, at their expense, an Assessment Report certified by a Qualified Environmental Professional (QEP) as defined by and meeting the intent of the RAR. All applications falling under the RAR will still be subject to Council review. (District of Highlands, 2013, p. 74-75).

*Development Permit Area No 3 – Sensitive Vegetation*

Four areas on the site are designated by the District of Highlands as sensitive vegetation DP areas: the large wetland in the centre of the site, the large SEI

woodland polygon in the centre of the site, the SEI woodland polygon in the southeast corner, and the SEI older second growth forest polygon in the northeast corner (**Figure 10**). The guidelines for these areas as described by the District of Highlands are below:

1. No unnecessary site disturbances shall be permitted within areas designated as sensitive vegetation.
2. In treed areas, mature vegetation will be protected, as will understorey plants and immature trees.
3. The level of the land surface will not be changed in sensitive vegetation areas if such change could affect the health of vegetation or the ecological structure of plant communities.
4. Drainage will not be altered in ways that increase or decrease the amount of surface water or groundwater available to the sensitive vegetation.
5. Where necessary, provision will be made and works undertaken to maintain the quality of water reaching the sensitive vegetation.
6. Removal of gravel, sand, soil or peat in sensitive vegetation areas will be strictly limited.
7. The Development Permit may designate and specify where necessary, a buffer zone within which land alteration or structures will be limited to those compatible with the characteristics of the sensitive vegetation.
8. Planting of invasive non-native vegetation adjacent to or in designated sensitive vegetation areas will not be permitted.
9. Older Second Growth Forests Category – Only the following guidelines apply to the older second growth forest category:
    a. Where older second growth forests are adjacent to the sensitive ecosystems in Development Permit Area 3 (Sensitive Vegetation) and to riparian or wetland areas, options for conservation will be considered. In such cases, buffers of older second growth forest will be maintained as determined by a registered biologist. At the very least, site disturbances into such areas will be minimized.
    b. Loss of ecosystem functions will be minimized, while maintaining the resource use value of the property.
    c. Where such areas occur in isolation from other ecosystems, efforts should be made to retain the largest patches possible.
    d. Minimize edge effects by:
        i. Retaining patches of forest rather than isolated trees.
        ii. Treed areas should have the least possible amount of edge per unit area (i.e., should be as close to round as practical).
        iii. The windward edge should be smooth and in areas of deep soils and well rooted trees.
        iv. Edge stabilization treatments including feathering, sail pruning, topping, and removal of unsound trees should be used to ensure a windfirm edge.
    e. Manage recreational and livestock access to avoid damage to vegetation, soils and wildlife.

f. Prevent disturbance of nesting and breeding areas.
g. Control the introduction and spread of invasive plant species.
h. Allow natural disturbances and successional functions and processes to occur.
i. Infrastructure (including wells and septic fields) should avoid trees and their root masses that are to be conserved. Generally, staying back the distance equal to the height of a tree from its base or 15 metres, whichever is greater, will achieve this.
j. Schedule land disturbance activities to avoid the spring nesting and breeding season forcoastal wildlife.
k. Design and implement appropriate sediment and erosion control measures. (District of Highlands, 2013, p. 77-78).

Lastly, in their 2001 Parks and Recreation Master Plan, the District of Highlands identified a portion of the subject property as a proposed connecting corridor between Millstream Road and Thetis Lake Regional Park (**Figure 8**). The proposed preliminary concept plan has been designed to accommodate a connecting corridor.

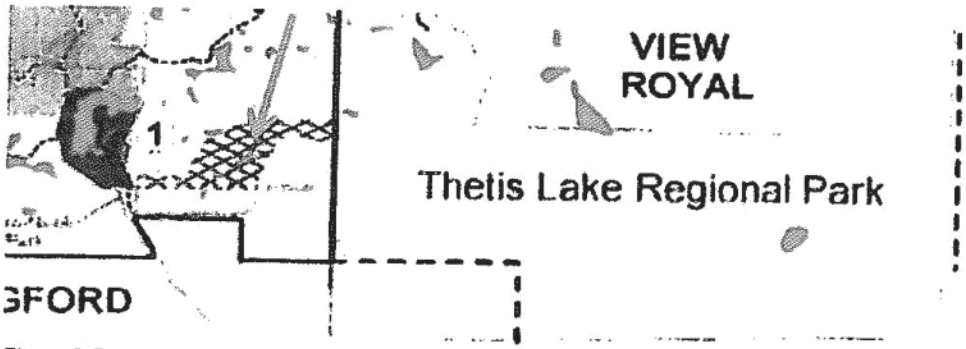



Figure 8. Zoomed-in selection of that portion of Map 4 from the Highlands 2001 Parks and Recreation Master Plan showing the proposed connecting corridor (green hatching & red arrow) through the subject property to Thetis Lake Regional Park.

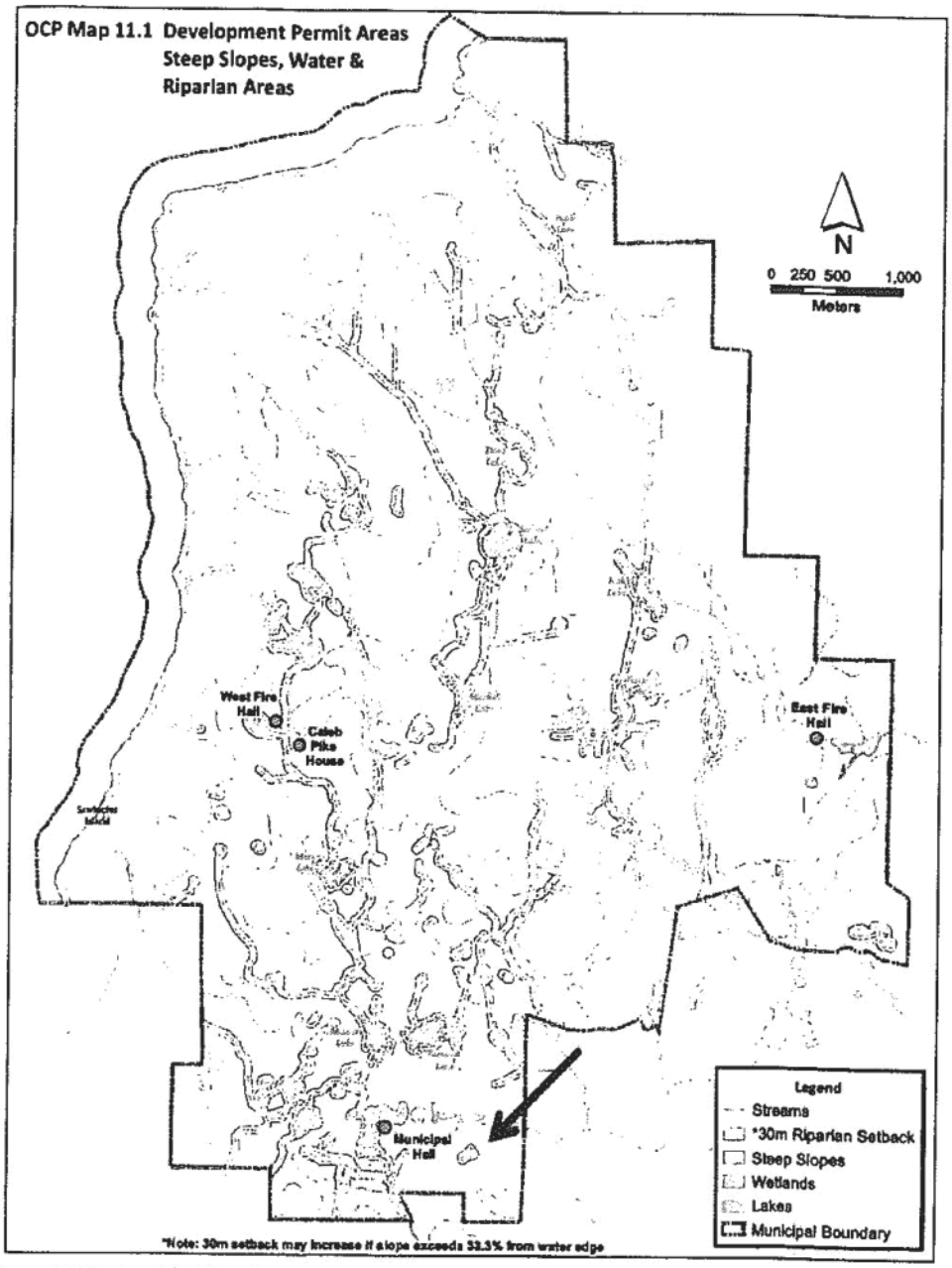



Figure 9. District of Highlands OCP maps showing the DP areas for steep slopes, water & riparian areas. The subject property is identified with the black arrow.

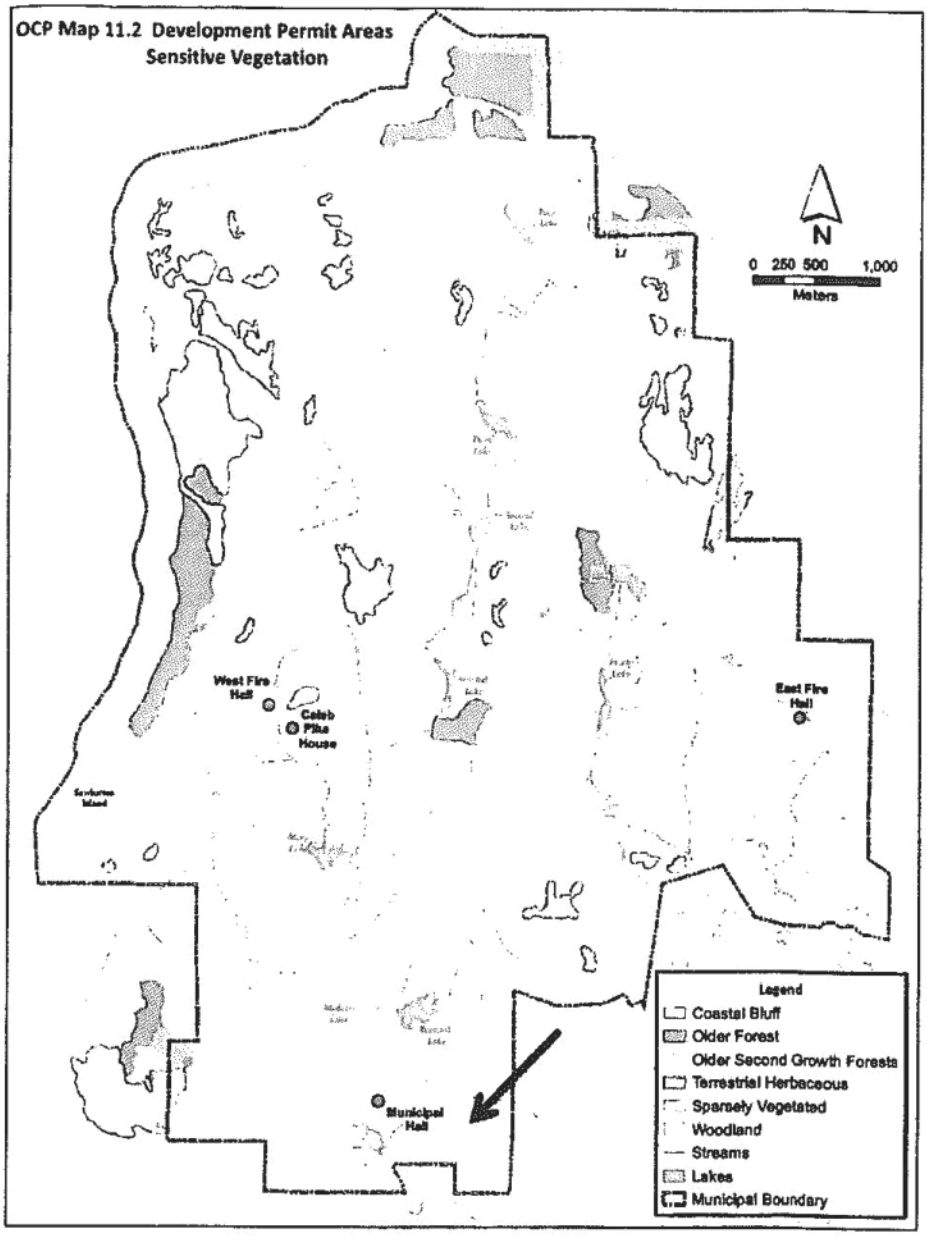



Figure 10. District of Highlands OCP map showing the DP areas for sensitive vegetation. Four DP areas exist on the subject property (black arrow) that correspond to the four SEI polygons shown in Figure 2.

## Recommendations

*Please note that these recommendations apply only to the subject property, not to adjacent lands.

- Protect Teanook Creek by increasing the size of the buffer along the northern property edge. Although an RAR Assessment Report has not been conducted for this stream/wetland complex, it is likely that the RAR-based SPEA would be in the 20 – 30 metre range. If the stream channel was determined to be a riparian wetland (Lentic habitat) there would be a prescriptive 30 metre buffer established by the RAR Method.
- A buffer of 50m from the edge of the active floodplain on Teanook Creek is recommended. Given that the landscape elevations will be heavily modified by the proposed rock extraction activities, this extended buffer will protect a portion of the hillside to the south of Teanook Creek and, therefore, maintain the hydrology of this system. This extended buffer will also protect the older second growth forest SEI polygon on the northeast property corner. This extended setback may also negate the need to conduct a RAR assessment and a Water and Riparian DP on Teanook Creek as one is only required if work is proposed within 30 metres of the high water mark.
- Protect those sections of Teanook Creek and the Unnamed Tributary to Millstream Creek in the southwest corner of the site that exist on the subject property by following the Riparian DP setback as prescribed in the District of Highlands OCP or as otherwise recommended by a QEP. The Riparian DP setback cannot practically be applied on the remainder of the site if the OCP-directed commercial/industrial land use is to be accomplished.
- Given the proposed development of the site is to have it re-zoned as an Industrial Park, with extensive rock removal, it does not appear possible to maintain the water table and hydrology required to support the large wetland complex in the centre of the site. The proposed removal of much of the rock on the site, to create a landscape capable of supporting an Industrial Park, would almost certainly result in the loss of hydrological integrity within the wetland. The loss of the wetland's capability to retain water would lead to its becoming a dry depression no longer capable of functioning as a wetland.
- The client may wish to meet with the District of the Highlands and identify areas on site, or within the district that require conservation and/or rehabilitation as compensation for removing the wetland complex in the centre of the site.
- If the wetland complex in the centre of the site is to be removed, consider undertaking riparian plant salvage. In addition, fish and amphibian salvage may be required under provincial salvage permits.
- Areas to be protected such as the interface with Thetis Lake Regional Park, the Unnamed Tributary to Millstream Creek in the southwest corner of the property, and Teanook Creek may need an additional buffer to accommodate

windfall or invasive species colonization that will likely occur along the disturbed edge once the majority of the trees are removed from the site. This buffer, or a forested edge management strategy, should be established with the help of an arborist.

- In the future, prior to any site disturbance, the property should be reviewed by an appropriate Qualified Environmental Professional (QEP) to look for raptor nests, active bird nests, and sharp-tailed snakes – all of which are protected under the Wildlife Act.

Figure 12. Representative photo of the Capital Regional District industrial property to the northwest of the subject property. Invasive species are rampant including poison hemlock.

Figure 13. Large wetland area associated with the defined channel of Teanook Creek.

Figure 14. Representative photo of the typical character of Teanook Creek along the northern property boundary. The creek has an extensive active floodplain. In this location the stream channel is a single thread structure with shallow banks and remnant channels on the adjacent terraces that also function as active floodplain.

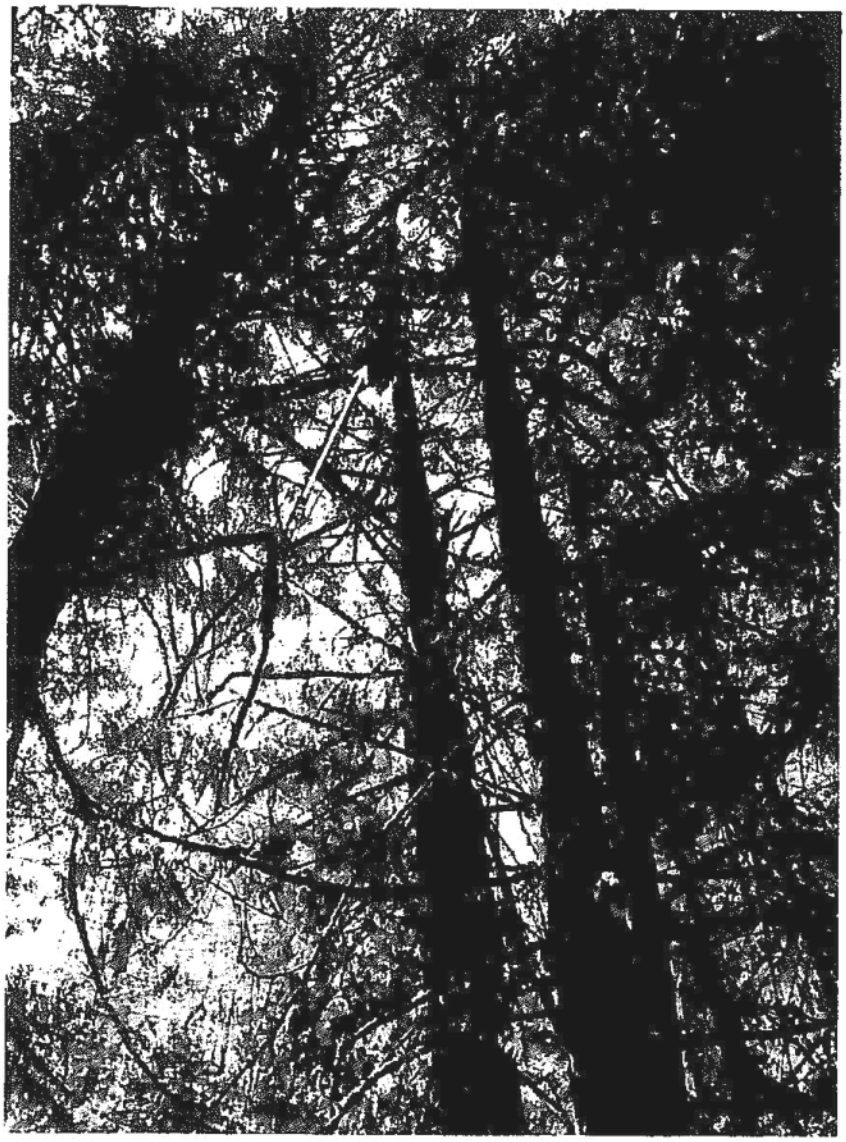


Figure 15. A copse of western redcedar at the upper end of a small tributary to Teanook Creek. A nest is visible in the upper branches of the redcedar in the middle of the photo.

Figure 16. A view over Teanook Creek from a rocky knoll along the south bank. The photograph is oriented to the north looking across the riparian area. Note the ravine below the knoll.

Figure 17. The waterfall on Teanook Creek. This small section of creek has a steep gradient and no floodplain. The northern red-legged frog was observed here. This waterfall represents a significant change in the landscape gradient, as the land slopes east toward Thetis Lake Regional Park, in the background.

Figure 18. Teanook Creek downstream of the waterfall in the northeast corner of the property. Downstream of the waterfall the stream channel widens into a braided stream/riparian wetland on the forest floor. The stream channel has been wandering across the broad, flat forest floor. Note the mossy rocks in the stream channel, an indication the stream channel is stable and not subject to flashy eroding flood velocities.

Figure 19. A modified western redcedar and tree fort or hunting blind on the north bank of Teanook Creek.

Figure 20. The small isolated wetland on the southern property boundary. The dominant vegetation species in this wetland are hardhack and red-osier dogwood.

Figure 21. The large SEI wetland in the centre of the site (open, sunny area in the background of the photograph). The vegetation community in this wetland is dominated by hardhack, red-osier dogwood, and willow. Black cottonwood is present on the banks while thick salal and oceanspray make up the upslope shrub understorey.

Figure 22. The southern-most wetland area of the SEI wetland complex. The photographer is standing on the Millstream Industrial Park road on the southern property boundary.

Figure 23. The western-most wetland portion of the SEI wetland complex. This portion of the wetland is primarily composed of western redcedar and skunk cabbage.

Figure 24. The upstream end of the complex of wetlands on the CRD lands near the northwest subject property boundary. These wetlands have been historically disturbed with road construction.

Figure 25. The pond area at the upstream end of the Unnamed Tributary to Millstream Creek in the southwest corner of the property (this photo is facing upstream).

Figure 26. The Unnamed Tributary to Millstream Creek as it approaches Millstream Road. A small culvert carries flows under the road and into Millstream Creek.

Figure 27. A representative photograph of the terrestrial vegetation surrounding the rocky knolls. The dominant vegetation species are Douglas-fir, arbutus, and oceanspray

Figure 28. A representative photograph the top of a rocky knoll.

Figure 29. A view of the neighbouring gravel extraction operation and industrial park to the south of the subject property. The vegetated bedrock outcrop in the background left of the photograph is a SEI woodland that the CRD map shows connecting to the SEI woodland in the southeast corner of the subject property.

Figure 30. The southern extent of the woodland SEI polygon in the southeast corner of the site. The road and associated fill provide a transportation route to the eastern side of the Millstream Industrial Park. This road defines the southern boundary of the subject property.

Figure 31. Another view of the Millstream Industrial Park. The road at the right defines the southern boundary of the subject property (treed area).

Figure 32. The SEI woodland polygon at the centre of the site is a large mossy bedrock knoll surrounded by a dominant canopy of arbutus and a thick oceanspray shrub understory.

Figure 33. The southern slope of the SEI woodland polygon at the centre of the site.

## References


B.C. Conservation Data Centre. (2014). Occurrence report summary, shape ID:55772, Douglas-fir/dull Oregon-grape. B.C. Ministry of Environment. Retrieved from http://delivery.maps.gov.bc.ca/ess/sv/cdc

B.C. Conservation Data Centre. (2014). Occurrence report summary, shape ID:55880, Northern red-legged frog. B.C. Ministry of Environment. Retrieved from http://delivery.maps.gov.bc.ca/ess/sv/cdc

B.C. Ministry of Environment (MOE). (2010). *Certificate of Compliance*. (Regional file: 2650-20/7163; Victoria file: 2650-20/7163; SITE ID: 7163). Victoria, BC: BC Ministry of Environment.

District of Highlands and Judith Cullington & Associates. (2001). District of the Highlands Parks and Recreation Master Plan.

District of Highlands. (2013). District of Highlands Official Community Plan, Schedula A to Bylaw NO. 277.

Government of Canada. (2015). Species at risk public registry, species profile: Sharp-tailed snake. Retrieved from http://www.sararegistry.gc.ca/species/speciesDetails_e.cfm?sid=586

MOE. (2014). Develop with Care: Environmental guidelines for urban and rural land development in British Columbia. Section 4 – Environmentally valuable resources. Retrieved from http://www.env.gov.bc.ca/wld/documents/bmp/devwithcare/DWC-Section-4.pdf

MOE. (2015). Fisheries Inventory Data Queries. FISS Report Generator. Data Query performed for McKenzie Lake. May 4, 2015.

MOE. (n.d. a). Sensitive Ecosystems Inventories – Older Forest Ecosystems of Eastern Vancouver Island and the Gulf Islands. Retrieved from http://www.env.gov.bc.ca/sei/van_gulf/oldforest.html

MOE. (n.d. b). Sensitive Ecosystems Inventories – Wetlands of Eastern Vancouver Island and the Gulf Islands. Retrieved from http://www.env.gov.bc.ca/sei/van_gulf/wetlands.html

MOE. (n.d. c). Sensitive Ecosystems Inventories – Woodlands of Eastern Vancouver Island and the Gulf Islands. Retrieved from http://www.env.gov.bc.ca/sei/van_gulf/woodland.html

MOE. (n.d. d). Sensitive Ecosystems Inventories – East Vancouver Island & Gulf Islands Management Recommendations for SEIs. Retrieved from http://www.env.gov.bc.ca/sei/van_gulf/management.html

SHIP Environmental Consultants Ltd. (1997). The Craigflower Watershed Assessment. Prepared for the Capital Regional District. Victoria, BC: J.M. Roberts and E.A. Harding.

Stevens Management. (2000). Stage 1 preliminary site investigation of Section 5, Range 3W except Plan 40349, Highland District (Millstream Road property, Victoria). BC Assets and Land Corporation, Victoria File # 26250-20/7163.

Wartigg, W. (2010). BC's coast region: species & ecosystems of conservation plant community: Douglas-fire/dull Oregon-grape (Pseudotsuga menziezii /Mahonia nervosa). Retreived from http://ibis.geog.ubc.ca/biodiversity/factsheets/pdf/plant%20communities/douglasfir_dulloregongrape_cdfmm01.pdf

**Referral Response**

| | | | |
|---|---|---|---|
| Referral Type: | Notice of Work | Referral Number: | 94049930 |
| Reference Number: | Forests, Lands and Natural Resource Operations / 1610713 | Recipient Number: | 001 |
| Request Sent Date: | Jun 5, 2017 | Response Due Date: | Jul 5, 2017 |
| Status: | Closed | Contact Info: | Email Coordinator |
| Completion Date: | N/A | Name: | Ministry of Forests Lands and Natural Resource Operations - ESD/WASTE/WATER - Nanaimo Service Cnt |
| | | Recipient List: | Brenda Barr, Darryn MCConkey, Grant Bracher, Jacqueline Roden, Laura Body |

Respondent Name: Dr. Grant Bracher P.Ag., R.P.Bio.

## This Response is closed to further input. Thank you for your interest.

You are invited to comment on the following application(s). A response is optional. If no response is received by the deadline, the application(s) and adjudication process will move ahead.

This is a Notice of Work for Sand and Gravel.

Proponent: Ok Industries Ltd. (Barry Chalmers)

Authorization Type: Mines Act Permit

Intended Land Use/background context: Quarry mine for construction aggregate. Activities: blasting, excavation of pit run, crushing and mechanical screening.

BCGS Mapsheet: 92B.043

Legal Description: Lot 1, Sec 5, Rg 3 W, Highland District, Plan VIP70242

Location: Millstream Road, Highlands District

Area of Disturbance in ha. (approx.): 25.75 Ha +/- (Phase 1 - 6.5 Ha)

Please note for Municipal/Local Government:
In the event the applicant must apply for re-zoning, rezoning would not preclude the issuance of a Mines Act Permit.

### REFERRAL DOCUMENTS

| | Description | File Name |
|---|---|---|
| View | Referral Package | 2017-05-18 Ref Package 1610713.pdf |
| View | Status report | automated_status_sheet.xlsx |

### QUESTIONS

**Please answer the following questions. Where indicated or required, please explain your answer in the Response Text box provided.**

**If it would help to explain your answer, please upload any relevant documents below, and indicate "Document Attached" in the Response Text box.**

| | | | |
|---|---|---|---|
| ◉ Yes | ○ No | ○ N/A | Does this application impact your agency's legislated responsibilities? If yes, how will the proposal impact your legislated responsibility and please identify the relevant legislation (section) and what mitigative measures will be required to address these impacts in the response text box at the bottom of the page. |
| ○ Yes | ◉ No | ○ N/A | If the proposal proceeds, will the proponent require approval or a permit from your agency? If yes, please explain in response text box at the bottom of the page. |
| ○ Yes | ◉ No | ○ N/A | Will on-going compliance monitoring be required by your agency as a result of your legislated responsibilities? If yes, please explain what will be required in the response text box at the bottom of the page. |
| ○ Yes | ○ No | ◉ N/A | Will this application affect public use of this area? If yes, please explain in the response text box at the bottom of the page. |
| ○ Yes | ○ No | ◉ N/A | For Municipal/Regional Government Use Only: Is the application area zoned for the proposed purpose? If no, please provide the current zoning. In the event the applicant wishes to apply for re-zoning, please also provide the estimated time required for this decision. Your comments can be entered in the response text box at the bottom of the page. |

### RECOMMENDATIONS

**Please check one. Where indicated or required, please explain your answer in the box provided.**

**If it would help to explain your answer, please upload any relevant documents below, and indicate "Document Attached" in the Response Text box.**

- ☐ Approval of project is supported.
- ☐ Interests unaffected.
- ☐ No objection to approval of project.
- ☑ No objection to approval of project subject to the conditions outlined below.
- ☐ Recommend refusal of project due to reasons outlined below.
- ☐ N/A

**Response Text:**

Applicable Legislation - Wildlife Act, Fisheries Act

Note:

We recommend that the project proceed only if the watercourses on the property are protected. The wetland complex in the center of the property should be left intact with a minimum 30 m vegetated buffer surrounding it and the site hydrology remain as is so that the wetland is not adversely impacted. Teanook Creek and the unnamed tributary to Millstream Creek should be protected with a 30 m vegetated buffer.

Should the project proceed:

We recommend that vegetation clearing be minimized and occur outside the nesting period from March 1 to August 31 to reduce impacts on all bird species. A search for the nests of birds (eagles, peregrine falcons, gyrfalcon, ospreys and herons) protected under Section 34(b) of the Wildlife Act should be conducted before the start of vegetation clearing. Should the nest of a bird requiring protection under Section 34 (b) of the Wildlife Act be located, please refer to the recommended buffer distances in Table 4.1 (Section 4) of Develop with Care: Environmental Guidelines for Urban and Rural Land Development in British Columbia (MOE 2014) available at http://www.env.gov.bc.ca/wld/documents/bmp/devwithcare/index.html.

Excavation of the pit should remain a minimum of 1 metre above groundwater resources to prevent the breakout of groundwater.

To help prevent the release of sediment to local waters, we recommend that an effective sediment and erosion control plan be implemented. All extraction activities should be isolated from surface drainage through construction of perimeter ditches to settling ponds and ground infiltration or discharge to less than 25 mg/l standards. Diversion, collection and treatment works should be in place and operational prior to any other development of the pit site.

Explosives handling and utilization should be conducted in a manner which minimizes the opportunity for nitrate and blasting residue contamination of groundwater, site runoff and adjacent watercourses.

Top soil and overburden should be stockpiled and protected from erosion.

**DOCUMENTS**

| Description | File Name |
|---|---|
| View Bio-inventory | 1610713_Ecological Site Investigation_June 10 2015.pdf |

Cancel

Top

## Jager, Brenda CSNR:EX

**From:** Bracher, Grant FLNR:EX
**Sent:** Wednesday, November 29, 2017 12:21 PM
**To:** Harrison, Donald EMPR:EX
**Subject:** RE: Notice of Work 1610713 (quarry Millstream Rd)

Hello Don,

A Riparian Area assessment is **not** required.

Cheers,

*Grant Bracher, Ph.D., P.Ag., R.P.Bio.*
*Ecosystem Biologist*
*Ministry of Forests, Lands and Natural Resource Operations*
*and Rural Development*
*2080 Labieux Road*
*Nanaimo BC V9T 6J9*
*Tel. 250 751-3221*
*Fax. 250 751-3103*
*Grant.Bracher@gov.bc.ca*

---

**From:** Harrison, Donald EMPR:EX
**Sent:** Wednesday, November 29, 2017 12:08 PM
**To:** Bracher, Grant FLNR:EX
**Subject:** Notice of Work 1610713 (quarry Millstream Rd)

Hi Grant,

Thank you for your response to the referral of the proposed quarry in District of Highlands off Millstream road. You wrote "The wetland complex in the center of the property should be left intact with a minimum 30 m vegetated buffer surrounding it and the site hydrology remain as is so that the wetland is not adversely impacted."

Is the proponent required to conduct a Riparian Area assessment by a Qualified Environmental Professional (QEP) when the wetland is not reported to contain fish and is not connected on surface to a natural watercourse?
Thank you.

Don

***Don J. Harrison, P.Geo.***
Sr. Inspector of Mines–Permitting, SW Region

BC Ministry of Energy, Mines & Petroleum Resources
Mines & Mineral Resources Division
3rd Floor, 1810 Blanshard St,
Victoria, BC V8W 9M9
Direct Line: (778) 698-7014
Main office: (778) 698-3649