



DEVELOPMENT PERMIT NO. DP000941

OWEN GARDINER CONSTRUCTION LTD

Name of Owner(s) of Land (Permittee)

351 HARWELL ROAD

Civic Address

1. This development permit is issued subject to compliance with all of the bylaws of the municipality applicable thereto, except as specifically varied or supplemented by this permit.
2. This development permit applies to and only to those lands within the municipality described below, and any and all building structures and other developments thereon:

Legal Description:

LOT 1, SECTION 10, RANGE 7, MOUNTAIN DISTRICT, PLAN VIP63871

PID No. 023-526-891

3. The land described herein shall be developed strictly in accordance with the following terms and conditions and provisions of this permit and any plans and specifications hereto which shall form a part thereof.

Schedule A Location Plan

Schedule B Site Plan and Aquatic Setback Information, 351 Harwell

Schedule C Site Plan and Aquatic Setback Information, 355 Harwell

Schedule D RAR Executive Summary

Schedule E RAR Assessment Report

- a) If the applicant does not substantially commence the development permitted by this permit within two years of the date of this permit, the permit shall lapse.

4. This permit is not a building permit nor does it constitute approval of any signage. Separate applications must be made for a building permit and sign permit.
5. The City of Nanaimo "ZONING BYLAW 2011 NO. 4500" is varied as follows:

- *Part 6.3.1.5 – Watercourse Setback*

The leave strip on each side of all other creeks, rivers and streams identified in Schedule C shall include that area between the centre of the creek, river or stream and a perpendicular line inland from the top of the bank as indicated in Schedule C.

The proposed watercourse setback is 11.0m from the rear west corner of the dwelling and 7.0m from the rear northwest corner, a variance of 4.0m and 8.0m respectively.

AUTHORIZING RESOLUTION PASSED BY COUNCIL THE
14TH DAY OF SEPTEMBER, 2015.



Corporate Officer

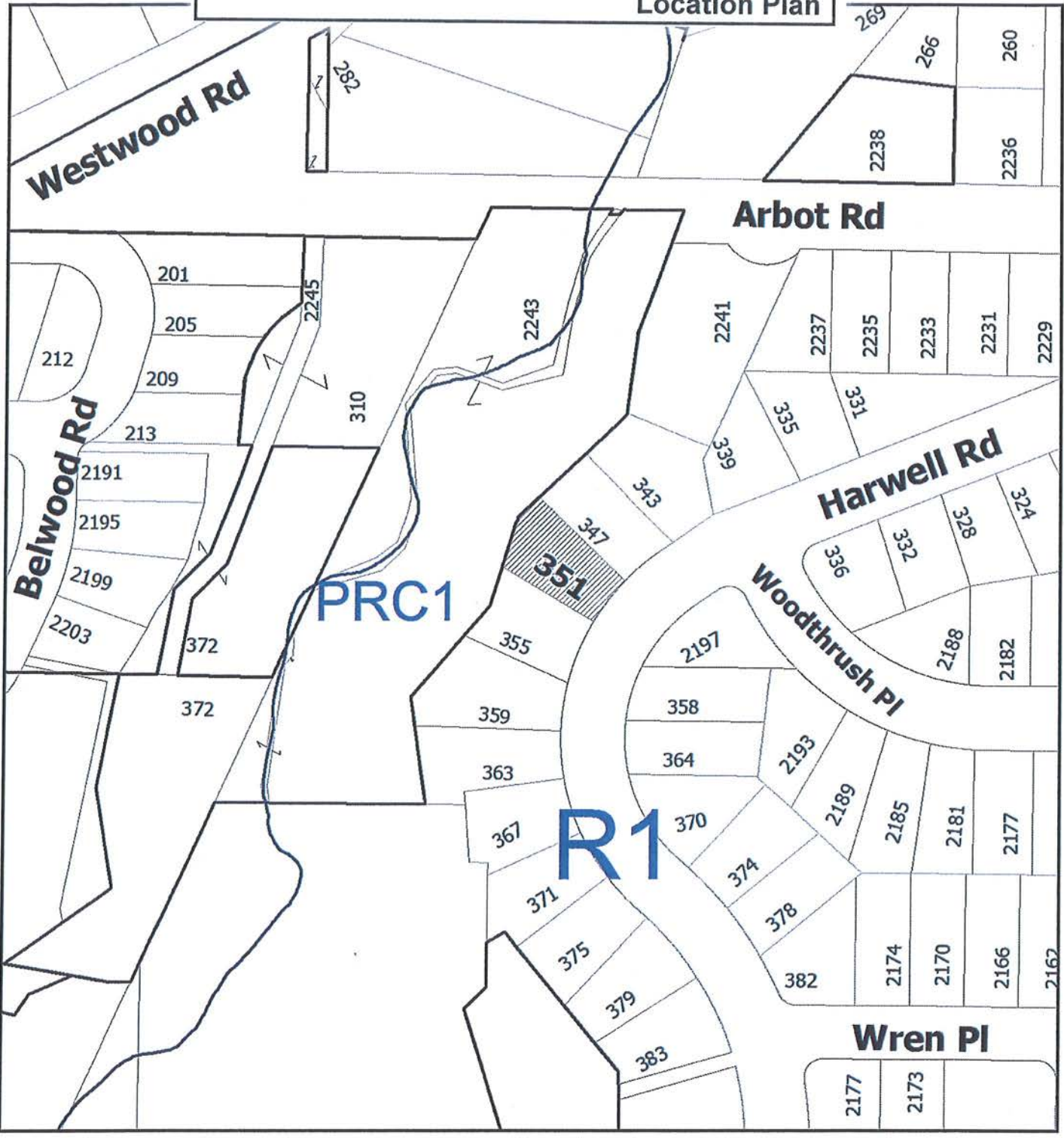


Date

GN/in

Prospero attachment: DP000941

Development Permit DP000941
351 Harwell Road
Schedule A
Location Plan



DEVELOPMENT PERMIT NO. DP000941

LOCATION PLAN

Civic: 351 Harwell Road
Lot 1, Section 10, Range 7, Mountain District,
Plan VIP63871

 **Subject Property**

July 7, 2015

Owen Gardiner
Owen Gardiner Construction
2720 Heather Way
Nanaimo, BC
V9K 1E5

Re: Executive Summary for watercourse setback variance at 351 and 355 Harwell Road, Nanaimo

Sea Sherpa Aquatic Services and Kawa Engineering were retained to review the subject properties (351 and 355 Harwell Road) and provide an opinion on whether seeking a watercourse setback variance for future development on the sites was feasible and ecologically appropriate. Assessment of the subject lots and local ecology followed Ministry of Environment's Riparian Areas Regulation Assessment Methodology. The results of this assessment determined that a setback variance was both feasible and ecologically appropriate.

The proposed variance request is required for the construction of two new homes (one on 351 and one on 355 Harwell) that are limited by the 15m watercourse setback from Darough Creek specified by Zoning Bylaw No. 4000. Home construction will require vegetation removal up to 5m from Darough Creek ravine Top of Bank. Vegetation proposed for removal within the subject lots does not appear to contribute to the function of the existing riparian habitat along the Darough Creek ravine. Vegetation is primarily Himalayan blackberry and mixed grasses—a condition indicative of a previously disturbed site. The vegetation is approximately 45 m away from Darough Creek and does not meaningfully contribute to the riparian ecology of Darough Creek. The Himalayan blackberry root system may provide added stability to the soils along the TOB, such that any soil exposure due to shrub removal may lead to accelerated weathering and erosion of soils during periods of inclement weather. Mitigation measures are available to ensure that exposed soils do not result in erosion of Darough Creek ravine. Mitigation measures are presented in Schedule D of this submission.

Construction activities do have the potential to result in impacts to Darough Creek and its Streamside Protection and Enhancement Area (SPEA). The undersigned professionals are committed to ensuring necessary mitigation measures for avoiding impacts to these areas are in place and functioning as intended. It is the opinion of the undersigned QEP that removal of vegetation up to 5m of TOB, with the implementation of effective mitigation measures, will avoid causing effects to the Darough Creek riparian area. Immediate revegetation of lands within 5 m of TOB, with native shrubs more commonly found in the region, is prescribed to occur as soon as practicable following site preparation for construction within the main building envelope. This action, along with the implementation of appropriate erosion and sediment control measures during construction, will preserve the upper portion of SPEA and is not expected to elicit harmful effects to fish habitat in and around the Darough Creek riparian area. Approvals from other government agencies, such Fisheries and Oceans Canada (DFO) are not required for commencement of this project. Given the lack of residual serious harm to fish habitat on Darough Creek and its SPEA, no fish habitat restoration or compensation is required for this project and DFO's guiding principle of "no net loss" of fisheries productivity can be upheld.

Respectfully,



Renny Talbot, Bsc
Biologist
Sea Sherpa Aquatic Service



Section 1. Description of Development Proposal and Fisheries Resources Values

Description of Development Proposal

The proposal is for housing developments at 351 (Lot 1 Plan VIP638871) and 355 (Lot 3 Plan VIP61358) Harwell Road. The two lots are adjacent to the Darough Creek (alias name) ravine (see Figure 1). The lots' northeast (NE) boundaries are considered to be at the Top of Bank (TOB), as defined in the Riparian Areas Regulation (RAR) enacted under Section 12 of the Fish Protection Act on July 2004¹. The two lots are primarily vegetated from Harwell Road up to TOB with Himalayan blackberry *Rubus discolor*, an exotic species considered to be invasive to the area, as well as non-specific mixed grasses indicative of a previously disturbed site (Figure 2).

Mature forest of Western red-cedar *Thuja plicata*, Douglas-fir *Pseudotsuga menziesii*, bigleaf maple *Acer macrophyllum*, and red alder *Alnus rubra* are located along the NE edge of the two lots and within 5 m of TOB. The City of Nanaimo has placed a watercourse development setback of 15 m from the TOB. Development on these two lots, if approved, will result in the removal of vegetation up to 5 m from the TOB; however, the developer does not propose to remove or alter any mature trees from within the 15 m setback, with the exception of one red alder and two juvenile grand fir *Abies grandis* trees. These trees are set back from the mature stand of trees along the TOB and are not expected to significantly influence the integrity of the root system in terms of geotechnical stability. The trees also have negligible influence on fish habitat protection values. Due to its proximity to the ravine, a geotechnical covenant of 15 m from the TOB has been placed on the two lots. Geotechnical assessment has determined that housing development within the proposed locations (refer to Section 3 – Site Plan) will not result in impacts to Darough Creek ravine (refer to Lewkowich Engineering Associates Ltd. Geotechnical Report included in the submission). Housing development within Lot 1, as proposed, ranges from 7-11 m from the TOB and housing development within Lot 3, as proposed, ranges from 8-11.8m. Placement of the houses in both lots will be wholly contained within the development area (refer to Section 3 – Site Plan). Apart from these

¹ B.C. Ministry of Environment's Riparian Areas Regulation calls on local governments to protect riparian areas during residential development by ensuring that a Qualified Environmental Professional (QEP) conducts a science-based assessment of proposed activities.

<http://www2.gov.bc.ca/gov/topic.page?id=FB284A0570084959BEBF55B9D4D4AEC2>

house footprints, clearing of Himalayan blackberry will occur up to 5m from the TOB and will be replaced by lawn, garden, and native shrubs.

Description of Fisheries Resource Values

Darough Creek (watershed code 920-395400-37900) originates from a tailrace at the Westwood Lake dam and flows within a steep-sided ravine downstream to Millstone River at Westwood Road. The tailrace pipe is screened and therefore no migration of fish occurs between Westwood Lake and Millstone River. The lower reaches of Darough Creek are low gradient and accessible to anadromous salmonids from Millstone River; however, the gradient increases substantially leading up to the tailrace (Figures 3 and 4). Millstone River has known populations of Coho salmon *Oncorhynchus kisutch*; Chum salmon *O. keta*; steelhead trout *O. mykiss*; rainbow trout *O. mykiss*; coastal cutthroat trout *O. clarkii clarkii*; threespine stickleback *Gasterosteus aculeatus*; pumpkinseed *Lepomis gibbosus*; and prickly sculpin *Cottus asper* (Habitat Wizard, 2015)². Coastal cutthroat trout are a Blue-listed species considered vulnerable in British Columbia. Darough Creek contains several cascades that limit fish access from Millstone River to the upper reaches of Darough Creek, including the reach adjacent to the subject lots. The cascade in Figure 3 was greater than 20% slope gradient at 11 m in horizontal length and approximately 2.5 m in vertical height. The cascade in Figure 4 had an approximate slope gradient of 85% with a horizontal distance 3.5 m and vertical height of 3 m. A search using the Fisheries Information Summary System (FISS)³ database and Habitat Wizard did not return any information on fish observations in Darough Creek. Ministry of Environment (MOE) officials confirmed on April 1, 2015 that resident coastal cutthroat trout reside in Darough Creek; however, the extent of distribution is unknown (M. Henigmen, MOE, pers. comm.) The lack of barriers in the lower reaches of Darough Creek and the information provided by the MOE has resulted in Darough Creek being designated as fish-bearing throughout, for the purpose of this RAR assessment; fish sampling was therefore not conducted.

A site visit to Darough Creek entailed an examination of the subject lots on March 18, 2015 with an assessment of Darough Creek, the ravine, and its associated riparian vegetation 200 m upstream and 200 m downstream of the subject lots. Ten stream

² Habitat Wizard (2015). Province of British Columbia Fish and Wildlife Mapping Tool. Retrieved from <http://maps.gov.bc.ca/ess/sv/habwiz/> (date of access?)

³ Fisheries Information Summary System (2015). Province of British Columbia and Fisheries and Oceans Canada Fisheries DataBase. Retrieved from <http://a100.gov.bc.ca/pub/fgd/welcome.do> (date of access?)

Riparian Areas Regulation - Qualified Environmental Professional - Assessment Report

transects were taken within the assessed area. Means (with standard deviations) for wetted and bank-full channel widths were measured at 1.55 ± 0.47 m and 2.15 ± 0.47 m respectively (e.g., see Figure 5). Stream depths averaged 0.12 m and the water temperature was 9 degrees Celsius. The difference between the mean of the wetted channel width and bank-full channel width was 0.6m. The reduced wetted and bank-full width below the tailrace is indicative of flow regulation, and thus stable channel flows. In addition, the creek contained an abundance of moss and leaf litter along the edge of the bank-full parameter and the high water mark was not pronounced. These factors are indicative of infrequent flood events (Figure 6). Stable water conditions are likely the result of the tailrace, which serves as the headwater input to the creek.

Stream reaches surveyed during the site visit ranged from 2% - 85% gradient and displayed a mixture of riffle-pool and step-pool morphology with intermittent cascades. The reaches had an abundance of large woody debris (LWD) as the dominant form of cover with sword fern *Polystichum munitum* and salmonberry *Rubus spectabilis* representing overhanging vegetation as the dominant secondary cover. The assessed reaches had trace amounts of cover in the form of deep pools and undercut banks.

Riparian vegetation within the ravine was predominately a mature canopy cover of mixed trees: Western red-cedar, Douglas-fir, bigleaf maple, red alder, and grand fir. Understorey vegetation was predominately sword fern, salmonberry, and dull Oregon-grape *Mahonia nervosa*. Riparian vegetation within the ravine was relatively undisturbed and well intact. The ravine width adjacent the subject lots is approximately 91 m from TOB to TOB (Figure 1). Pre-existing housing developments adjacent on both upstream and downstream ends of the subject lots have been constructed within 15 m of the ravine TOB (Figure 7).

Section 2. Results of Riparian Assessment

The subject lots at 351 and 355 Harwell Road are located at the TOB of the Darough Creek ravine. The TOB was located in the field using a handheld GPS. The ravine width adjacent to the lots was measured to be 91 m from TOB to TOB using Google Earth Pro® software (Figure 1.0). Excluding the high water width of Darough Creek, the ravine width at the subject location is 88.8 m. The RAR Assessment Methods (subsection 2.5.4.1) indicates that ravines to be greater than 60 m in width, which would receive a Streamside Protection Enhancement Area (SPEA) width of 10 m from TOB. The elevation profile displayed in Figure 1 was generated using Google Earth Pro® software and visually displays a cross-sectional transect of the ravine to provide evidence of its slope. The accuracy of the elevations presented has not been verified.

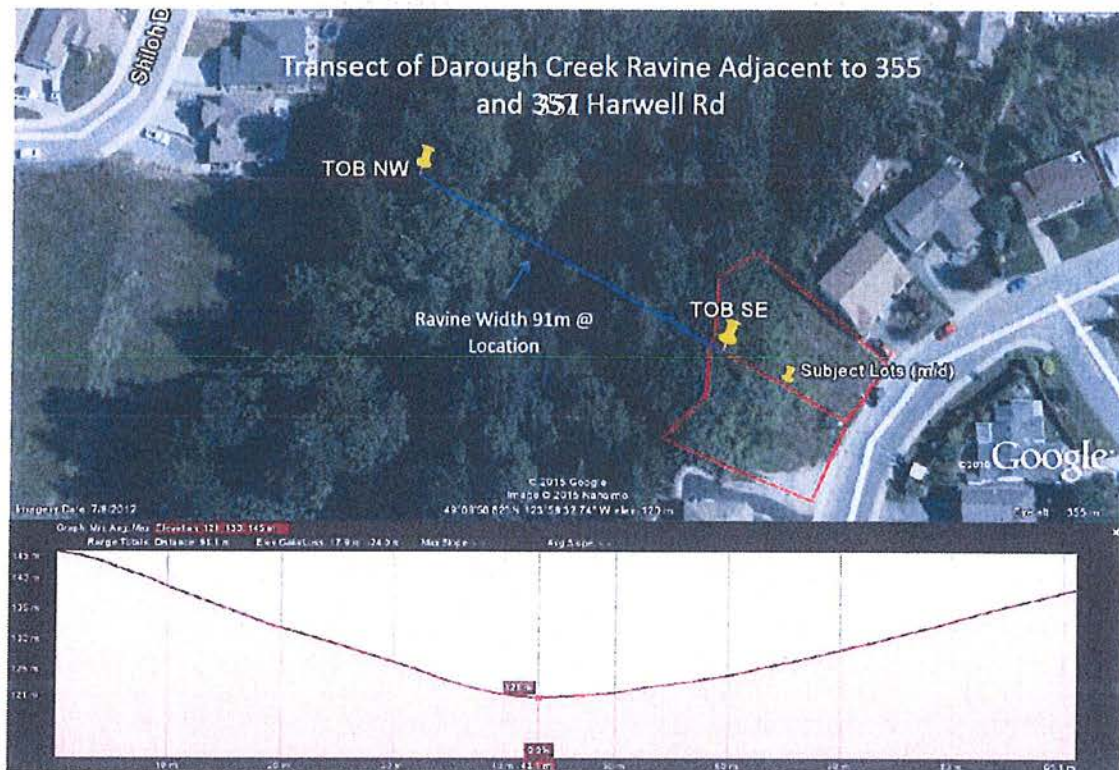
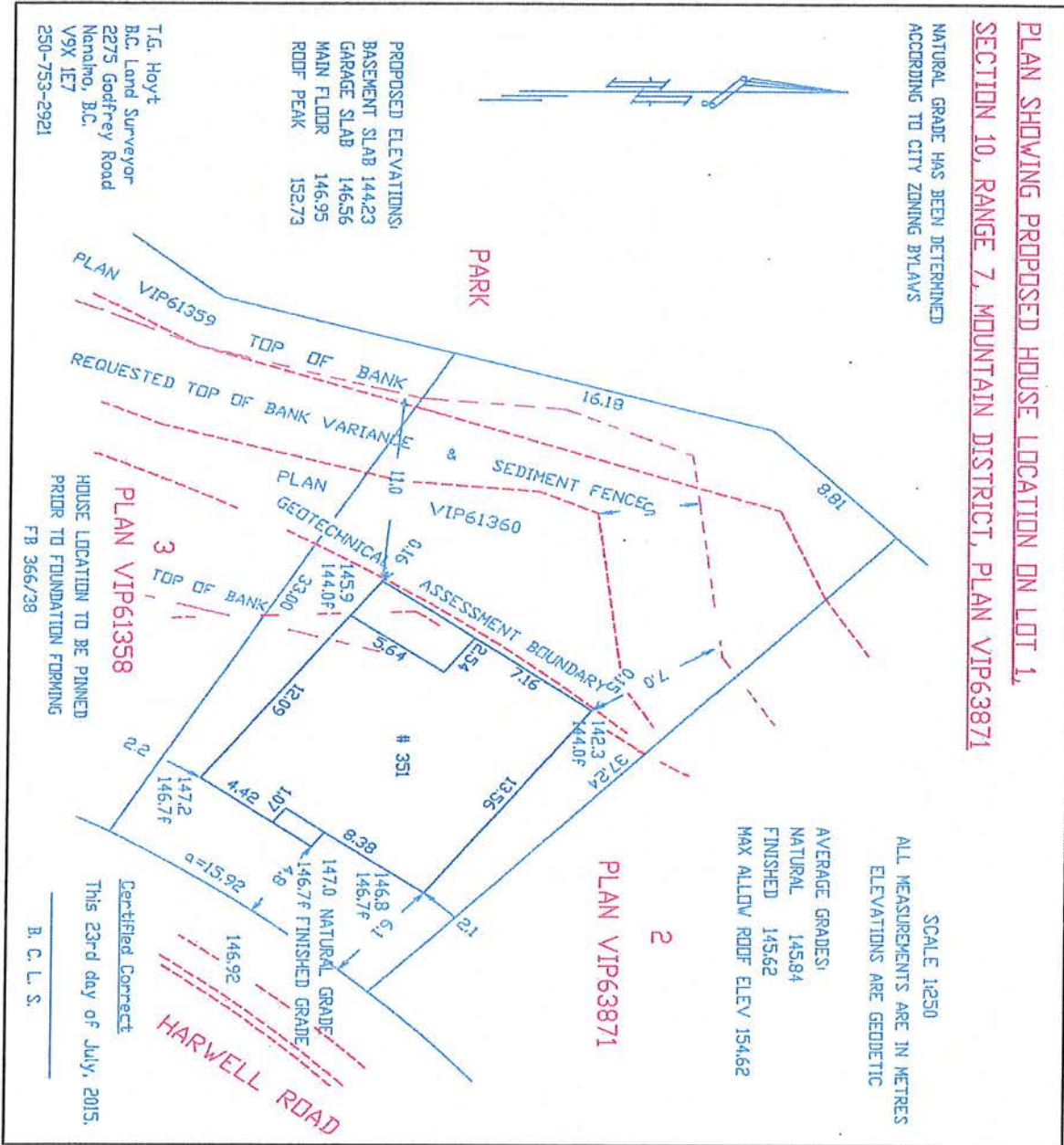
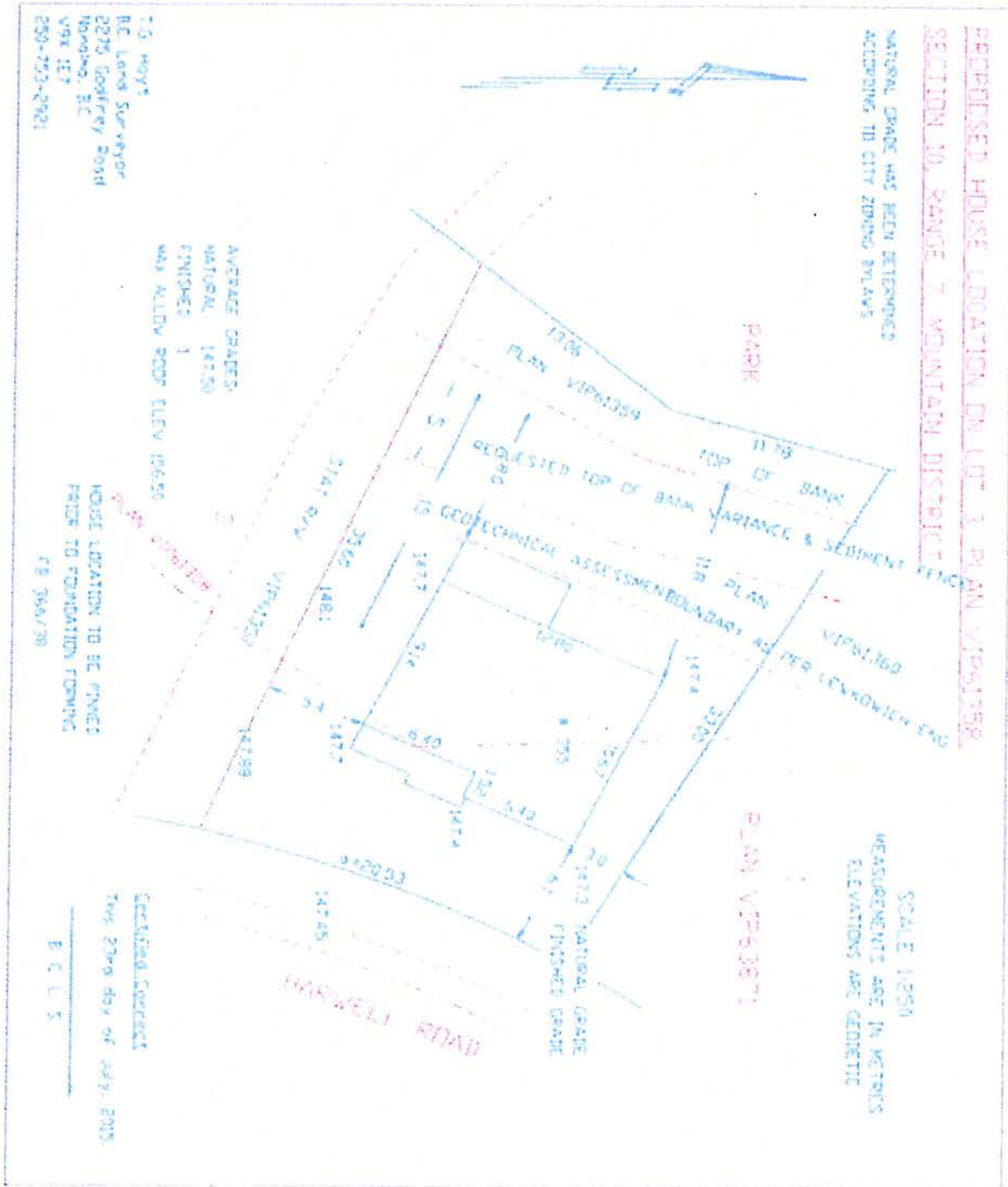


Figure 1: Google Earth Pro® image of 351 and 355 Harwell Road (above) with cross-sectional transect of Darough Creek from TOB to TOB and adjacent to the two lots (below).

Section 3. Site Plan



Riparian Areas Regulation - Qualified Environmental Professional - Assessment Report



Section 4. Measures to Protect and Maintain the SPEA

Project Planning:

- Placement of houses on both lots will remain within the development area boundary at distances > 5m from TOB (Section 3 – Site Plan).
- Land clearing will occur in the summer months during dry weather.
- Land clearing will not occur during periods of inclement weather unless sediment and erosion control measures are in place and monitored for effectiveness by an Environmental Monitor (EM).
- All hazardous materials such as gas, paint, primers, rust solvents, degreasers, grout, or other chemicals required for development will be stored in a contained location and will not enter the watercourse.
- An emergency spill kit will be onsite and a spill response plan will be developed prior to the start of work and communicated to the development crew by the EM, prior to undertaking development activities.
- Site overburden will be stored onsite and isolated in a manner outlined in the Erosion and Sediment Control Plan (ESCP) to prevent material from entering the watercourse.
- Site overburden will be disposed offsite at a permitted disposal location as soon as operationally possible.
- Construction waste will be stored onsite in a contained bin.
- Construction waste will not be allowed to enter the SPEA.
- Construction waste will be disposed offsite at a permitted disposal location as soon as operationally possible.

Operation of Machinery:

- Machinery will arrive onsite in a clean condition and will be maintained free of fluid leaks, invasive species, and noxious weeds.
- Washing, refueling and servicing machinery and storing fuel and other materials for the machinery will be done in such a way as to prevent the spread of noxious weeds and to avoid any deleterious substances from entering the water.
- Machinery will not enter the 5m from TOB setback.
- Operation of machinery may be curtailed during heavy rainfall events to prevent the discharge of sediment or deleterious substances into the watercourse.

Riparian Vegetation Removal:

- Mature trees protect other trees on the ravine slope from risk due to wind forces. Any removal of trees from the SPEA may result in blow down impacts on Darough Creek riparian area and receiving watercourses (i.e., Millstone River). Therefore, mature trees within 5 m of TOB will not be removed or harmfully altered.

Riparian Areas Regulation - Qualified Environmental Professional - Assessment Report

- Site excavation will occur in a manner that will not damage the roots of mature trees along the TOB.
- Removed vegetation will be stored in the designated storage location onsite prior to offsite disposal in a permitted disposal location.
- Himalayan blackberry shrubs will be removed and replaced with native shrubs, such as salmonberry.

Erosion and Sediment Control Plan:

- Prior to land clearing, sediment fencing will be installed 5 m from the TOB of Darough ravine within the two subject lots.
- Sediment fencing will be installed by personnel trained in erosion and sediment installation techniques and reviewed by the EM.
- Land clearing will begin at the front of the two lots providing a vegetated buffer between exposed soils and the SPEA for as long as possible.
- Overburden will be stored onsite in an isolated location determined by the EM.
- Sediment fencing will be installed around the overburden storage location.
- Overburden will be covered with a tarp or plastic for protection from rain and inclement weather.
- Cleared land will be sloped away from the SPEA to prevent surface and storm water from flowing into the SPEA.
- If rain events result in water pooling on the site, a settling pond will be constructed and surface water will be directed into it.
- Water from the surface of the settling pond will be pumped into a designated area within the SPEA that will not result in bank erosion or turbid water entering Darough Creek.
- Himalayan blackberry bushes removed from within 10 m from the TOB will be replaced with a band of native shrubs spanning the NE edge of the properties at a width of ≥ 2 m.

Section 5. Environmental Monitoring

A schedule of activities is proposed for the environmental monitoring plan:

- An EM will be onsite prior to start of land clearing and will brief construction personnel on the SPEA boundary and all measures to protect and maintain the SPEA.
- The EM will that the ESCP is implemented and functioning as intended during construction activities:
 - Development does not occur within 5m of the TOB,
 - Hazardous materials are stored properly,
 - Overburden and construction waste is handled and stored properly, and
 - Machinery remains free of fluid leaks, invasive species, and noxious weeds.
- The EM will be granted the authority to issue a stop work notice in instances of non-conformance and non-compliance of the measures to protect the SPEA.
- The EM will be responsible for notifying the Fisheries and Oceans Canada (DFO), MOE, and the City of Nanaimo if unanticipated harmful impacts to the SPEA and/or fish or fish habitat result from lot development.
- The EM will be hired by the land owner (Owen Gardiner) and will report directly to the land owner.
- The EM will be onsite full time during land clearing and site excavation activities.
- After land clearing and site excavation, the EM will conduct site inspections twice a week (Wednesday and Friday) for the first month of construction and once a week (Friday) for the remaining construction period.
- During periods of inclement weather, the EM will conduct daily site inspections.
- Site inspections will monitor and ensure that all measures to protect and maintain the SPEA are upheld.

Section 6. Photos



Figure 2: Primary vegetation located at lots 351 and 355 Harwell Road: mixed grasses, blackberry shrubs, and mature forest. Photo taken at the approximate centerline between the lots along Harwell Road looking northwest.



Figure 3: Cascade on Darough Creek with a distance of 11 m and height of 2.5 m (i.e., (23% gradient).



Figure 4: Cascade on Darough Creek with a distance 3.5 m and height of 3m (i.e., 85% gradient).



Figure 5: Sample transect of Darough Creek directly adjacent to the subject lots.

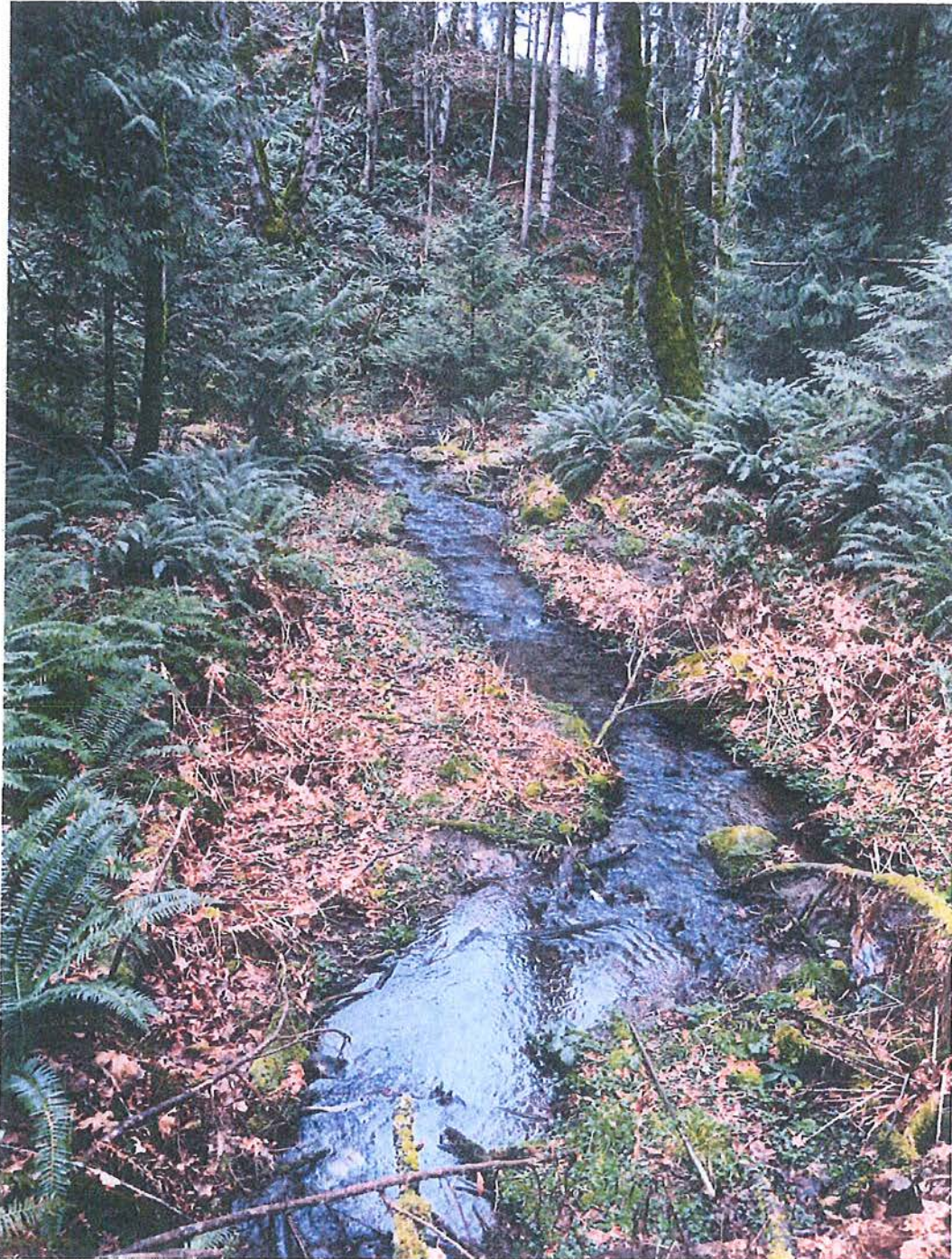


Figure 6: Darough Creek with moss and leaf litter along the shallow banks, indicating stable flows.



Figure 7: Retaining wall for adjacent land development along the 'top of bank' of Darough Creek.

Section 7. Professional Opinion

Vegetation proposed for removal within the subject lots does not appear to contribute to the function of the existing riparian habitat along the Darough Creek ravine. Vegetation is primarily Himalayan blackberry and mixed grasses associated with a previously disturbed site. The vegetation is approximately 45 m away from Darough Creek and does not contribute benefits of shading or nutrients inputs in the form of leaf litter. The Himalayan blackberry root system may provide added stability to the soils along the TOB, such that any soil exposure due to shrub removal may lead to accelerated weathering and erosion of soils during periods of inclement weather. Effective mitigation measures should be written into an ESCP, which include removal of the blackberry shrubs and replanting with comparable native shrubs in order to re-stabilize soils and discourage high traffic along the TOB.

The vegetation proposed to be removed is low lying and does not meaningfully protect the functioning riparian vegetation from wind forces. It is the opinion of the undersigned QEP that housing encroachment into the SPEA and any removal of this vegetation and effective mitigation within the subject lots, as has been proposed in this RAR assessment, will not elicit harmful effects to fish habitat in and around the Darough Creek SPEA.

Riparian Areas Regulation - Qualified Environmental Professional - Assessment Report

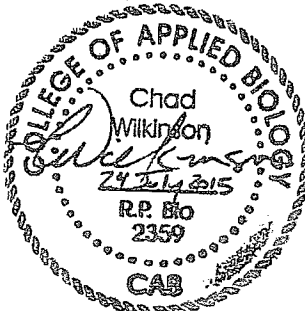
Assessment Report Professional Opinion on the Development Proposal's Riparian AreaDate 24 July 20151. I Chad Wilkinson certify that:

- a) I (Chad Wilkinson) am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the *Fish Protection Act*;
- b) We are qualified to carry out the assessment of the proposal made by the developer Owen Gardiner Construction, whose site plan proposal is included in Section 3 of this Assessment Report (i.e., the "development proposal");
- c) We have carried out an assessment of the development proposal and my assessment is set out in this Assessment Report; and
- d) In carrying out my assessment of the development proposal, We have followed the assessment methods set out in the Schedule to the Riparian Areas Regulation; AND

2. As a qualified environmental professional, I Chad Wilkinson hereby provide my professional opinion that:

- a) if the streamside protection and enhancement areas identified in this Assessment Report are protected from the development proposed by the development proposal and the measures identified in this Assessment Report, in conjunction with the outcome of the Geotechnical Assessment, as necessary to protect the integrity of those areas from the effects of the development, are implemented by the developer, 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 in which the development is proposed.

Respectfully submitted,



Chad Wilkinson, BSc (Hons), MSc (Zool), RPBio #2359

Environmental Manager

