

City of Surrey  
PLANNING & DEVELOPMENT REPORT

Application No.: 7918-0298-00

Planning Report Date: March 8, 2021

PROPOSAL:

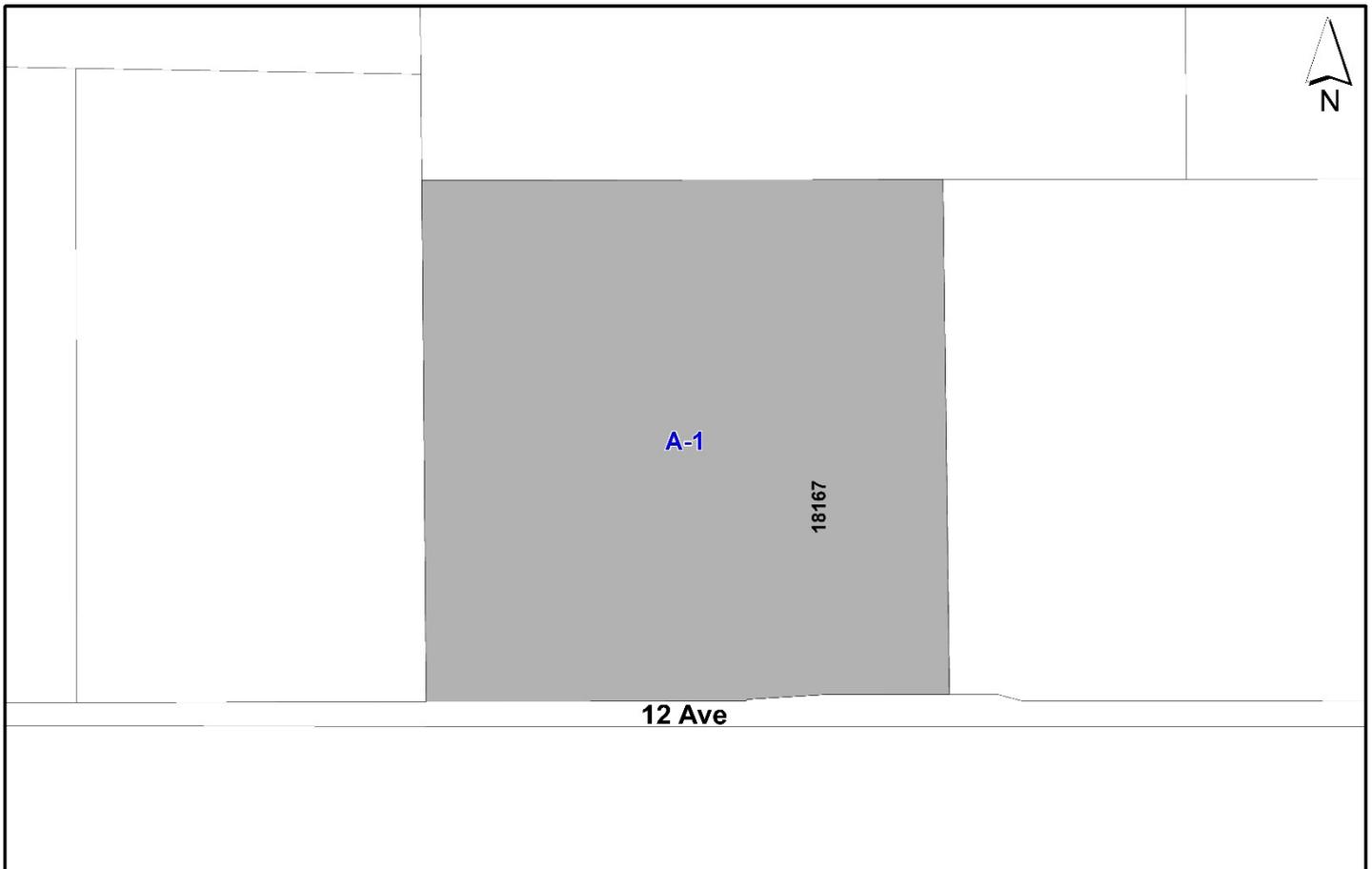
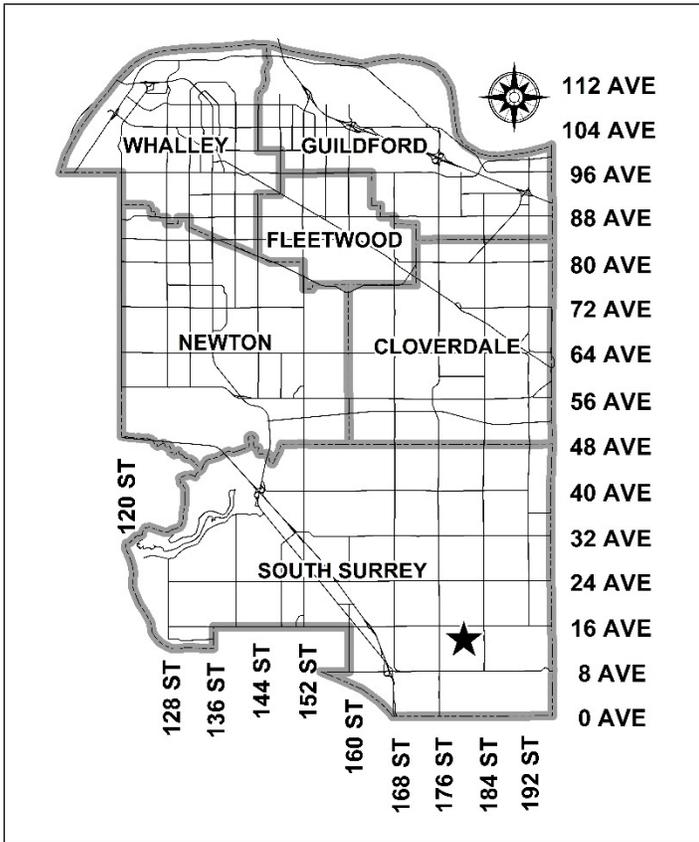
- Non-adhering residential use under Section 20.1 (2) of the ALC Act.
- Development Permit

to allow the construction of a single family dwelling while retaining an existing dwelling on the property.

LOCATION: 18167 - 12 Avenue

ZONING: A-1

OCP DESIGNATION: Agricultural



**RECOMMENDATION SUMMARY**

- Approval and Execution of Development Permit for Sensitive Ecosystems.
- Refer the subject non-adhering residential use application to the Agricultural Land Commission (ALC).

**DEVIATION FROM PLANS, POLICIES OR REGULATIONS**

- The applicant is proposing to reside in the existing single-family dwelling on the lot during construction of the new single-family dwelling, which requires approval by the Agricultural Land Commission (ALC).

**RATIONALE OF RECOMMENDATION**

- The applicant is proposing to reside in the existing single-family dwelling on the lot during the construction of the proposed dwelling, which requires ALC approval.
- The proposal to reside in the existing single-family dwelling on the lot during the construction of the proposed dwelling does not contravene the Zoning By-law or Official Community Plan policies.
- The Building Division has procedures in place to ensure the removal of the existing dwelling upon completion of the proposed dwelling. The ALC has the discretion to place similar conditions on their decision.
- The applicant has applied to the ALC for a Non-Adhering Residential Use. A resolution must be passed by Council to refer the application to the ALC before the ALC will review and consider the application.
- The proposal complies with the Development Permit requirements in the OCP for Sensitive Ecosystems (Streamside Areas).

## RECOMMENDATION

The Planning & Development Department recommends that:

1. Council approve Development Permit No. 7918-0298-01 for Sensitive Ecosystems (Streamside) and authorize the Mayor and Clerk to execute the Permit.
2. Council authorize referral of the application to the Agricultural Land Commission.

## SITE CONTEXT & BACKGROUND

Direction	Existing Use	OCP Designation	Existing Zone
Subject Site	Agriculture (ALR)	Agricultural	A-1
North:	Greenhouse/Agriculture (ALR)	Agricultural	A-1
East, West, South (Across 12 Avenue):	Agriculture (ALR)	Agricultural	A-1

### Context & Background

- The subject site is located at civic address 18167 – 12 Avenue and is approximately 16 hectares in area.
- The property is designated "Agricultural" in the Official Community Plan (OCP), is zoned "General Agricultural Zone (A-1)" and is located within the Agricultural Land Reserve (ALR).
- The property is actively being farmed and has farm status under the BC Assessment Act.
- Approximately 2.8 hectares of the property is being used to grow plants for a cut flower operation (annuals, perennials, shrubs, and trees) and to grow potted succulents, perennials and shrubs for retail sale. The applicant estimates that in 2021 they will produce 400,000 stems and 5,000 potted plants.
- Approximately 8.9 hectares of the property is being used for hay production.
- There is an existing single family dwelling and a collection of outbuildings sited along the central farm road.
- The applicant is proposing to construct a new single family dwelling on the property.
- Several tree and watercourse violations were discovered on the property after the applicant had submitted their Sensitive Ecosystem Development Permit application. These violations have been dealt with through Development Permit No.7918-0298-00, which was issued by the Delegated Official on March 16, 2020 and through a concurrent Water Sustainability Act violation.



- *Apply for a permit with the Building Division;*
- *post a \$30,000 bond for removal of the existing dwelling; and*
- *register a Restrictive Covenant on Title of the Land requiring the existing dwelling be removed from the property 30 days after the new dwelling receives final occupancy.*

*The standard procedure of the Building Division is to ensure the existing dwelling is removed from the property 30 days after final occupancy of the new dwelling, staff do encourage applicants to have the existing house demolished before occupancy of the new dwelling.*

- AEIAC commented that the location of the existing farm residential footprint would have been a better option for the proposed dwelling from the perspective of preserving farmland. The proposed dwelling is replacing existing hayfield whereas the existing dwelling and adjacent outbuildings are located in a historically disturbed area.

*The proposed farm residential footprint is compliant with the siting requirements of the A-1 Zone, whereas the historic farm residential footprint no longer conforms to the siting requirements for a single family dwelling in the A-1 Zone. The applicant would need to apply for a Development Variance Permit to locate the single family dwelling within the historic farm residential footprint.*

## **POLICY & BY-LAW CONSIDERATIONS**

### **Agricultural Land Commission Act and Regulations**

- On February 22, 2019, the Agricultural Land Reserve Use Regulation (ALR Use Regulation) was approved by B.C.'s Lieutenant Governor in Council, bringing into force changes to the Agricultural Land Commission Act (ALCA) under Bill 52 -2018, Agricultural Land Commission Amendment Act, 2019.
- One of the key changes of Bill 52 -2018 was providing the ALC with new oversight over residential uses and structures on ALR land, including limiting the maximum floor area of a principal dwelling (i.e. a maximum area of 500 square metres), limiting a property to one dwelling, and limiting the amount of area of a property that can be filled for the purpose of residential construction (i.e. a maximum area of 1,000 square metres).
- Where a landowner seeks to exceed the maximum floor area allotment or construct more than one residence on a property, they must apply to the ALC for a Non-Adhering Residential Use.
- Section 20.1(2)(a) of the ALCA states that an owner can apply to the commission for permission under Section 25 for a Non-Adhering Residential Use.
- Section 7-A of the ALC Information Bulletin – 05 – Residences in the ALR, states that an application to the ALC is required if an owner wants to reside in the only residence on the property (also known as the "principal residence") while constructing a new residence to replace the principal residence.

- As such, the applicant has submitted a Non-Adhering Residential Use application to the ALC to seek permission to reside in the existing principal dwelling during construction of the new single-family dwelling.
- As part of the application review process by the ALC, comments from the local government are required. A resolution must be passed by Council to refer the application and provide comments to the ALC before the ALC will consider the application.
- Retaining the existing dwelling temporarily on the lot to provide lodging for the property owner during construction of the new dwelling, is considered to have merit. As such, staff recommends that the Non-Adhering Residential Use application be forwarded to the ALC for consideration.
- Should City Council recommend to forward the application to the ALC for review, the ALC will review other components of the proposed residence (i.e. size of the dwelling and the proposed fill area) to ensure compliance with their regulations.

### **Official Community Plan**

#### Land Use Designation

- The subject property is designated as "Agricultural" in the Official Community Plan (OCP). The proposal complies with the designation in the OCP.

#### Zoning By-law

- The "General Agriculture Zone (A-1)" contains specific requirements about siting single family dwellings known as the farm residential footprint. Regulations in the A-1 Zone regarding the farm residential footprint are as follows:
  - The maximum setback of a single family dwelling is 50 metres from the front property line;
  - The maximum area of the farm residential footprint is 2,000 square metres in area; and
  - The maximum depth of the farm residential footprint is 60 metres from the front lot line.
- The proposed single family dwelling is consistent with the farm residential footprint requirements of the "General Agriculture Zone (A-1)".

## DEVELOPMENT PERMITS

### Sensitive Ecosystems (Streamside Areas) Development Permit Requirement

- The subject property falls within the Sensitive Ecosystems Development Permit Area (DPA) for Streamside Areas in the OCP, given the location of existing Class A, Class A-O (red-coded) and Class B (yellow-coded) watercourses which flow through the southeastern portion of the property. There is also an unmapped wetland located in the wooded area located at the north end of the property. The Sensitive Ecosystems (Streamside Areas) Development Permit is required to protect aquatic and terrestrial ecosystems associated with streams from the impacts of development.
- The applicant is proposing to construct a single family dwelling adjacent to a Class A-O ditch (red-coded) that is located in the 12 Avenue road allowance.
- In accordance with Part 7A Streamside Protection setbacks of the Zoning By-law, a Class A-O (red-coded) watercourse requires a minimum streamside setback of 15 metres, as measured from the top of bank. The proposed siting of the single family dwelling complies with the setback requirements outlined in the Zoning By-law.
- The riparian area will be protected through the registration of a combined Restrictive Covenant/Right-of-Way against the property to ensure safeguarding and maintenance of the Protection Area in perpetuity, in compliance with the OCP. Executed copies of this legal document have been filed with the BC Land Title and Survey Authority.
- The riparian area for the Class C-O (red-coded) ditch will be protected through fencing.
- An Ecosystem Development Plan, prepared by Laurie Kremsater, *R.P. Bio.*, R.P.F., of Madrone Environmental Services and dated October 10, 2019 was reviewed by staff and found to be generally acceptable. The report has been incorporated into the Development Permit.

## INFORMATION ATTACHED TO THIS REPORT

The following information is attached to this Report:

Appendix I.	Site Plan
Appendix II.	Draft Agricultural and Food Security Advisory Committee Minutes
Appendix III.	Development Permit No. 7918-0298-00

*approved by Shawn Low*

Jean Lamontagne  
General Manager  
Planning and Development

BD/cm



**STEPHEN DEE**

18167 12 AVENUE, SURREY, BC V3Z 9R9  
 ph 604 760-8506 email: stephen@dee.ca

PROJECT:  
 DEE RESIDENCE

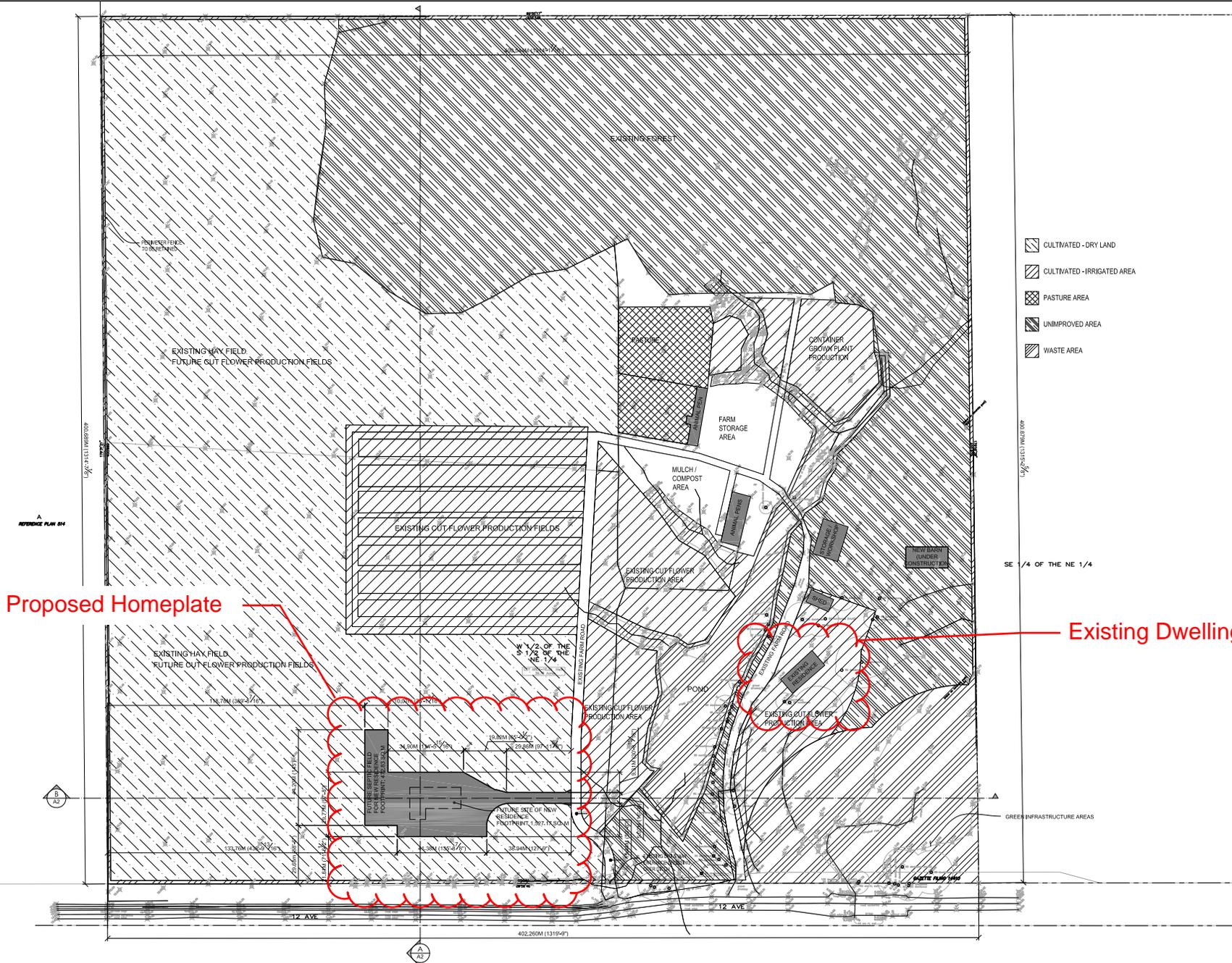
DRAWING:  
 SITE PLAN

DRAWING NUMBER:  
**A1**

DATE: DEC 22, 2020

SCALE: 1/4" = 1'

DRAWN: DT DESGN: DT CHECKED: SD



Proposed Homeplate

Existing Dwelling

setback requirements of the A-1 Zone, therefore a Development Variance Permit is proposed to make the existing setback compliant.

- Members expressed the importance to decommission the home, potentially increasing the bond amount and trust the home will not be used as a secondary dwelling.
- In response to a question from the Committee, it was asked if staff can apply policies that would ensure the original home is decommissioned before final approval of the new dwelling. It was noted that building conditions could be added to the application.

It was

Moved by S. VanKeulen

Seconded by Councillor Nagra

That the Agriculture, Environment, and

Investment Advisory Committee recommend to the General Manager of Planning and Development to support Development Application 7920-0090-00 on conditions the dwelling becomes an accessory building and not a second dwelling.

Carried

**2. Development Application 7918-0298-00**

Ben Daly, Planning Technician

File: 7918-0298-00; 18167 – 12 Avenue

The proposal is for Non-Adhering Residential Use Application and Development Permit for Sensitive Ecosystems.

- The site is approximately 16 hectares in area, designated "Agricultural" in the Official Community Plan (OCP), is zoned "General Agricultural Zone (A-1)" and is located within the Agricultural Land Reserve (ALR).
- The applicant is proposing a Non-Adhering Residential Use Application to the Agricultural Land Commission (ALC) to allow the temporary retention of an existing dwelling on the property while a new dwelling is being constructed.
- It was suggested that prior to granting final approval of the new home, the existing home that is being retained during the construction should be demolished.
- The Committee expressed concerns on the placement of the dwelling in which staff advised that the location chosen complies with City zoning bylaws and ALC requirements.
- It was suggested to construct the dwelling within the existing farm residential footprint area. In response, Staff advised that they cannot make an applicant place their home outside the requirements of the zoning bylaw. Staff clarified that it is the decision of the applicant to proceed with a Variance Permit or not. In response to a question from the Committee, it was noted that the Farm Home Plate states that the dwelling and all accessory buildings be placed in a certain setback.

- In response to a question from the Committee, staff clarified that no business license is required to grow agricultural products.

It was Moved by Councillor Patton  
 Seconded by Councillor Nagra  
 That the Agriculture, Environment, and  
 Investment Advisory Committee recommend to the General Manager of Planning  
 and Development to support Development Application 7918-0298-00.  
Carried

In future, the Committee would like to see the most viable option available to preserve the as much farmland as possible.

*Councillor Hundial joined the meeting at 3:40 p.m.*

3. **Development Application 7920-0209-00**  
 William Siegner, Planning Technician  
 File: 7920-0209-00; 4311 King George Boulevard

The proposal is for a Development Variance Permit to permit a 41-metre telecommunication tower in the Agricultural Land Reserve. The application is being presented for information only.

- The site is approximately 1.6 hectares in size, designated "Agricultural" in the Official Community Plan (OCP), zoned "General Agricultural Zone (A-1)", and located within the Agricultural Land Reserve (ALR). The property is currently used as part of an adjacent nursery and stonework business.
- Telecommunication towers are needed to help meet City of Surrey emergency response, economic development, and service delivery goals.
- Staff noted that there are additional spaces further down the pole that can be propose for future use.
- The Committee expressed concerns on the height of the tower and that the location and height would impact local air traffic at the surrounding regional airports that are located within the ALR.
- The Committee expressed concerns on the lighting aspect, given the proximity to the Serpentine River, particular in the evening, that light pollution can affect migrating birds. Staff noted that this can be reviewed by the consultant.

It was Moved by Councillor Patton  
 Seconded by S. VanKeulen  
 That the Agriculture, Environment, and  
 Investment Advisory Committee receive Development Application 7920-0209-00  
 as information.  
Carried

4. **Development Application 7920-0140-00**  
 Donna Quesada, Planning Technician

(the "City")

**DEVELOPMENT PERMIT**

NO.: 7918-0298-01

Issued To:

(the "Owner")

Address of Owner:

**A. General Provisions**

1. This development permit is issued subject to compliance by the Owner with all statutes, by-laws, orders, regulations, or agreements, except as specifically varied by this development permit.
2. This development permit applies to that real property including land with or without improvements located within the City of Surrey, with the legal description and civic address as follows:

Parcel Identifier: 002-413-337

West Half of the South Half of the North East Quarter Section 8 Township 7 New  
Westminster District

18167 – 12 Avenue

(the "Land")

3. This development permit applies to only that portion of the buildings and structures on the Land shown on Schedule A which is attached to and forms part of this development permit.
4. The Land has been designated as a development permit area in Surrey Official Community Plan, 2013, No. 18020, as amended.

**B. Sensitive Ecosystem**

1. Development shall occur strictly in accordance with the Ecosystem Development Plan prepared by Madrone Environmental Services Ltd., dated October 10, 2019 and referenced as Schedule B.

2. The Riparian Protection Area, including the Riparian Setback Area as defined in Surrey Zoning By-law, as may be amended, or replaced from time to time, and shown outlined in a solid heavy line on the Explanatory Plans EPP105413 and EPP105412, shall be established, inspected, and maintained in accordance with Schedule B.
3. Riparian Protection Areas shall remain free of development and left undisturbed.
4. Habitat protection, mitigation, compensation, and rehabilitation works shall be completed in accordance with Development Permit No. 7918-0298-00.
5. Minor changes to the Drawings that do not affect the Riparian Protection Area or Green Infrastructure Protection Area, as identified and forming part of this development permit, site grading, soil stability, building placement, runoff, or vegetation on the Land, may be permitted subject to the approval of the City.

**C. Monitoring**

1. A Qualified Environmental Professional must be retained by the Owner to ensure completion of the works in accordance with this development permit and shall submit monitoring reports and a completion report to the City.

**D. Administration**

1. The Land shall be developed strictly in accordance with the terms and conditions and provisions of this development permit.
2. This development permit shall lapse if the Owner does not substantially start any construction with respect to which this development permit is issued within two (2) years after the date this development permit is issued. The terms and conditions of this development permit, and any amendment to it, are binding on any and all persons who acquire an interest in the Land.
3. This development permit is only valid for the development that is described in this development permit. If a change to development is considered, a new development permit or an amendment to this permit is required before any work is started.
4. All reports, documents and drawings referenced in this development permit shall be attached to and form part of this development permit.

5. In addition to this development permit, and in accordance with the Surrey Building Bylaw, as may be amended or replaced from time to time, a restrictive covenant for environmental protection and a combination statutory right of way/covenant for maintenance access and environmental protection have been registered as a charge on the Land.
  
6. This development permit is issued subject to compliance by the Owner and the Owner's employees, contractors, and agents with all applicable City bylaws, including the Tree Protection Bylaw, Erosion and Sediment Control Bylaw and the Soil Removal and Deposition Bylaw, all as may be amended or replaced from time to time.
  
7. This development permit is NOT A BUILDING PERMIT.

AUTHORIZING RESOLUTION PASSED BY THE COUNCIL/DELEGATED OFFICIAL, THE DAY OF \_\_\_\_\_, 20\_\_ .

ISSUED THIS \_\_\_\_\_ DAY OF \_\_\_\_\_, 20\_\_ .

\_\_\_\_\_  
Mayor

\_\_\_\_\_  
City Clerk

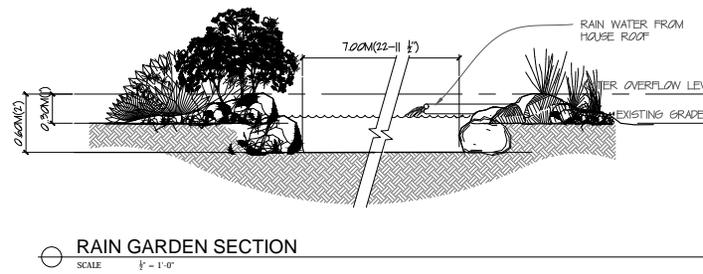
IN CONSIDERATION OF COUNCIL APPROVAL OF THIS DEVELOPMENT PERMIT AND OTHER GOOD AND VALUABLE CONSIDERATION, I/WE THE UNDERSIGNED AGREE TO THE TERMS AND CONDITIONS OF THIS DEVELOPMENT PERMIT AND ACKNOWLEDGE THAT WE HAVE READ AND UNDERSTOOD IT.

\_\_\_\_\_  
Owner: (Signature)

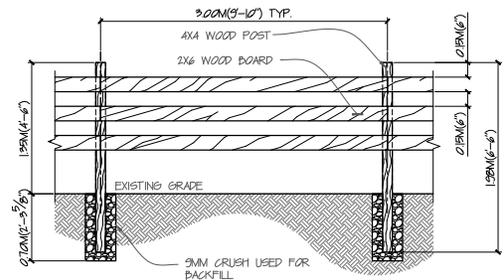
\_\_\_\_\_  
Name: (Please Print)

# SCHEDULE A

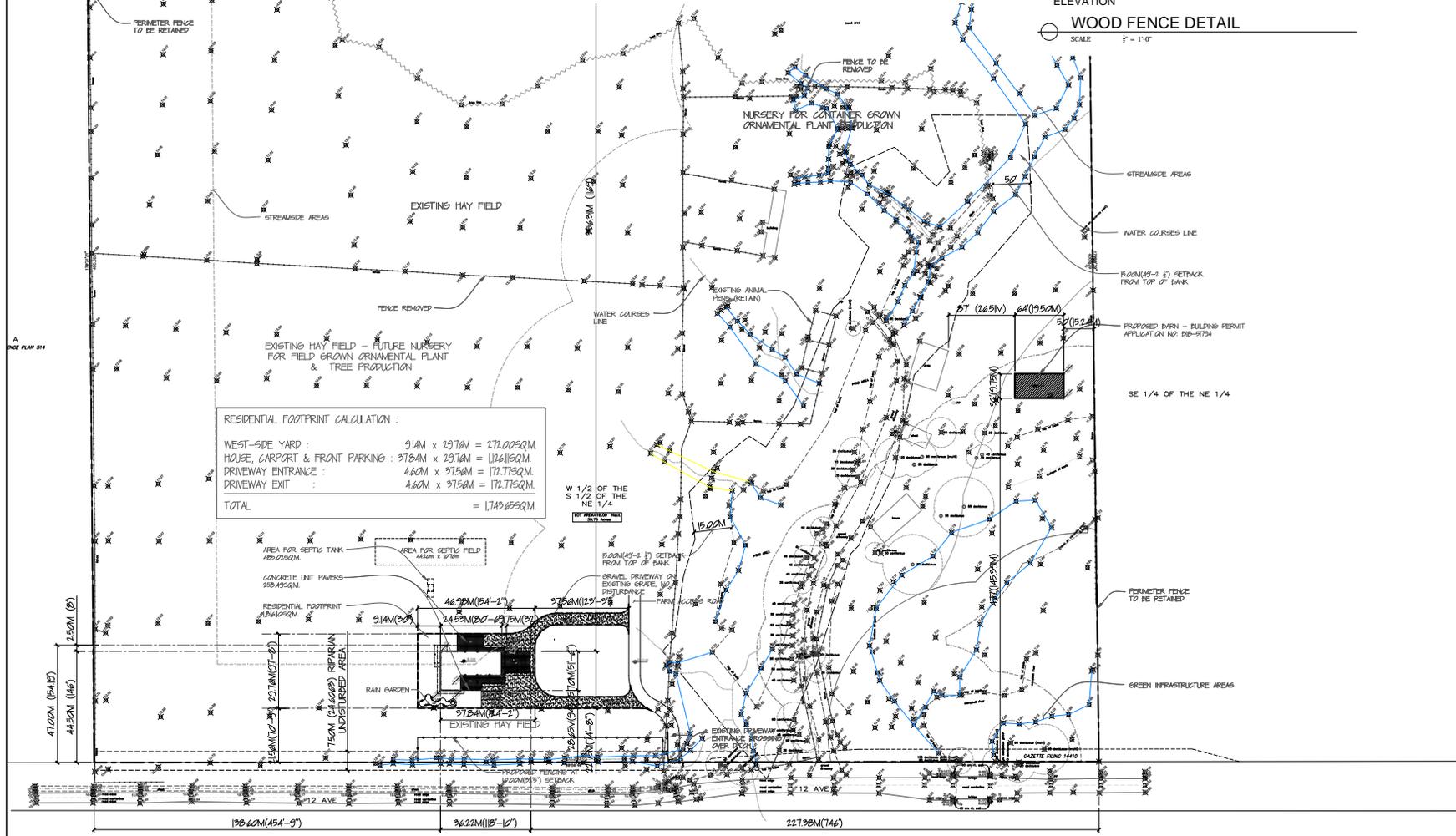
ALL



**RAIN GARDEN SECTION**  
SCALE 1" = 1'-0"



**ELEVATION WOOD FENCE DETAIL**  
SCALE 1" = 1'-0"



**RESIDENTIAL FOOTPRINT CALCULATION :**  
 WEST-SIDE YARD : 9.14M x 29.76M = 272.00SQM.  
 HOUSE, CARPORT & FRONT PARKING : 37.84M x 29.76M = 1126.15SQM.  
 DRIVEWAY ENTRANCE : 4.60M x 37.56M = 172.75SQM.  
 DRIVEWAY EXIT : 4.60M x 37.56M = 172.75SQM.  
**TOTAL = 1,743.65SQM.**

A  
PAGE PLAN 2/4



NO	DATE	DESCRIPTION
3	JAN 9, 2019	RESIDENTIAL FOOTPRINT REVISED
2	OCT. 2, 2018	REVISION AS PER CITY COMMENTS
1	AUG 8, 2018	ISSUED FOR DEVELOPMENT PERMIT

**STEPHEN DEE**  
 18167 12 AVENUE, SURREY, BC V3Z 9R9  
 PH 604 760-8506 email : stephen@dee.ca

PROJECT:  
 18167 12 AVENUE, SURREY, BC  
 PROPOSED RESIDENCE

DRAWING:  
 ECOSYSTEM DEVELOPMENT PLAN

DRAWING NUMBER:  
 DP.01

DATE:  
 SCALE: 1/4" = 1'-0"  
 DRAWN: ES DESIGN: ES CHECKED: SD



**ECOSYSTEM DEVELOPMENT PLAN**

**18167, 12<sup>th</sup> Avenue  
Surrey BC**

**FOR:**

**Mr. Stephen Dee  
Isidore Landscapes Inc.  
21200 River Road  
Richmond, BC V6V 1M3**

**BY:**

**Angela Doiron, B.Sc., R.P.Bio.  
Project Biologist  
July 18, 2018**

**Revision 1: February 12, 2019**

**Liz Shebib, B.Sc.  
Laurie Kremsater M.Sc., R.P.Bio. R.P. F.**

**Revision 2: October 10, 2019**

**Laurie Kremsater M.Sc., R.P.Bio. R.P. F.**

**Madrone Environmental Services Ltd.**

MADRONE ENVIRONMENTAL SERVICES LTD.

#202-2790 GLADWIN ROAD • ABBOTSFORD • BC • V2T 4S7

TEL 604.504.1972 • FAX 604.504.1912 • WWW.MADRONE.CA

DOSSIER: 18.0252

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## ECOSYSTEM DEVELOPMENT PLAN

# 18167, 12<sup>th</sup> Avenue, Surrey BC

## 1 Introduction

This is a third revision of an EDP submitted first on July 18, 2018. The first revision was October, 2018, the second revision was January 2019; and this report is the third revision. The revisions address comments from City of Surrey (CoS) as site conditions and site plans have changed. The author of the initial EDP was Angela Doiron, who has taken a position with the City of Surrey and so revisions to her report have been made by Liz Shebib and Laurie Kremsater of Madrone.

A summary of revisions follows:

- The October 10, 2018 revision added to the July 18, 2018 report by including a table outlining how the 52 points in the Sensitive Ecosystem Development Permit Guidelines are addressed (Appendix 1), a revised site plan (Appendix 2), and a fencing plan and cost estimate (Appendix 3). Those attachments were supplied by the architect who has been in touch with the City of Surrey to provide the fencing cost (Appendix 3) and site plan (Appendix 2) and summarize the relevant material from the report into Appendix 1. Angela Doiron had taken a position with the City of Surrey at that time, and so the attachments were added by Laurie Kremsater. No other revisions to the July report were made for the October revisions.
- Revisions in the January 2019 version primarily pertain to clarity in stream classifications (or reclassifications) and potential presence of species at risk (Barn Owl have been uplisted) and other minor points of clarification.
- **Revisions in this October 2019 version address changed site plans, include a new Bald Eagle nest management plan, include a sentence on securities for fencing around the house, and revised maps to more clearly**

**show watercourse classifications. Not the drainage works were done on the property that were the subject of habitat restoration plan. That habitat restoration plan has a slightly different stream map than included in this EDP, but the stream within 50 m of the house remain the same in both plans.**

## **2 Background**

The City of Surrey (CoS) has an interest in ensuring development/activities are consistent with senior government legislation, best management practices (BMPs), guidelines, and recovery strategies. This is done to ensure development and / or activities align with CoS's DP3 Development Permit Guidelines, which aim to conserve Sensitive Ecosystems (such as fish-bearing streams, ditches and dikes) to ensure negative impacts on the natural environment (including species at risk) do not occur. The CoS requires that all Sensitive Ecosystem Development Permit Areas are inspected by Qualified Environmental Professionals (QEPs) so that applicants who wish to develop within the 50 m permit areas may demonstrate they have addressed wildlife/species-at-risk requirements.

Stephen Dee, owner of Isidore Landscapes Inc., hired Madrone Environmental Services Ltd. (Madrone) to conduct an environmental assessment on his property located at 18167 12<sup>th</sup> Avenue in Surrey BC. His aim is to begin farming operations on the property, after building a new single-family residence.

This assessment will provide the CoS and the landowner with background information about the sensitive ecosystems on the property and offer recommendations to maintain the function of those ecosystems during and after the planned development. This Ecosystem Development Plan (EDP) is a summary of that environmental assessment, and will act to support a Development Permit application to the CoS for development of the property. The EDP will highlight recommendations and key areas that will require setbacks from construction and development activities.

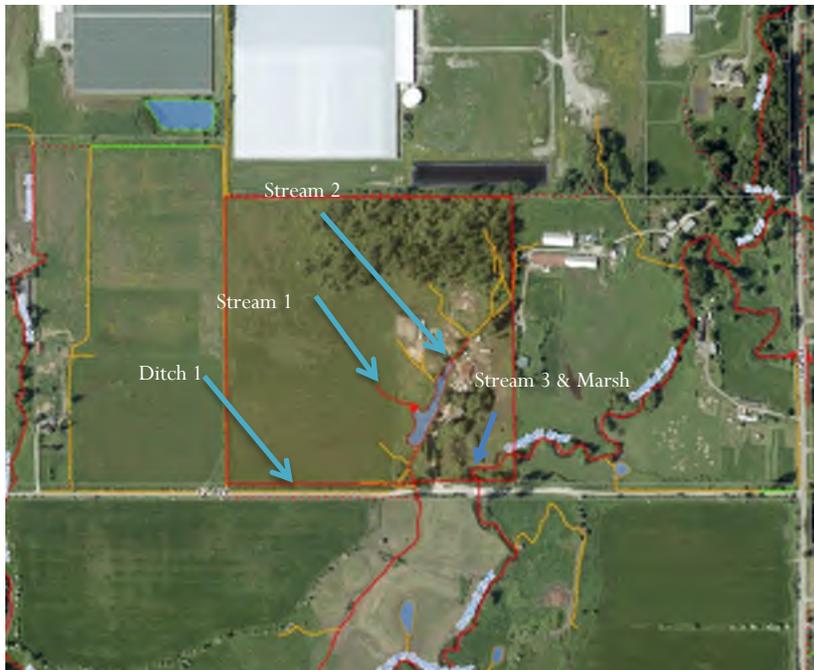
## **3 Site Description**

The property (located at 18167 12<sup>th</sup> Avenue in Surrey BC) is approximately 16 hectares, and is zoned by the CoS as general agricultural (A-1). It has a ditch and two stream systems that require a Streamside Protection Area buffer (50 m around all fish-bearing streams).

The Green Infrastructure Area around the corridor of the Campbell River is also on the property, at the southeastern corner.

The lot currently has several old existing buildings. The landowner plans to build a new home on the property, as well as a new shed for farm use. The new home will require that an existing vehicle access is upgraded to a gravel driveway, on the west side of the central watercourse. Although the vehicle access area is rather narrow, the landowner has assured us that it is sufficiently wide for the proposed uses and will not need to be widened.

Figure 1 (below) shows an overview of the property, including current stream classifications of the watercourses, and reporting labels for each stream.



**FIGURE 1. OVERVIEW OF 18167, 12<sup>TH</sup> AVENUE IN SURREY, BC** (COSMOS, 2018). Stream Locations are visible as Class A and Class B streams according to current CoS Mapping.

The property's Sensitive Ecosystem Development Permit Areas (DPAs) (classed under the "Streamside Sensitive Ecosystems"), are associated with streams that have been identified by the CoS as being fish-bearing Class A natural streams. Fish Class "A" streams are described by the CoS as being "inhabited by salmonids year round, and/or [streams that are] potentially inhabited year round with access enhancement". The CoS requires that a Qualified Environmental Professional prepare an Ecosystem Development Plan for any proposed infrastructure and construction works that occur within 50 m of these streams. These DPAs encompass 50 m from all streams (i.e., ditches, wetlands, creeks, and rivers).

The DPA also includes 50 m from the edge of all Green Infrastructure Networks, which affects the southeast corner of the property near the Little Campbell River.

This report will therefore rely on the City of Surrey's Zoning Bylaw 12000 Part 7a (Streamside Protection) to determine appropriate setback buffers to construction. These buffers are termed "streamside protection areas", and are based on CoS's fish classification system. The report will also take into account the Green Infrastructure Network Corridor that surrounds the Campbell River, and propose measures to protect this important ecological resource.

## **4 Off-site Conditions**

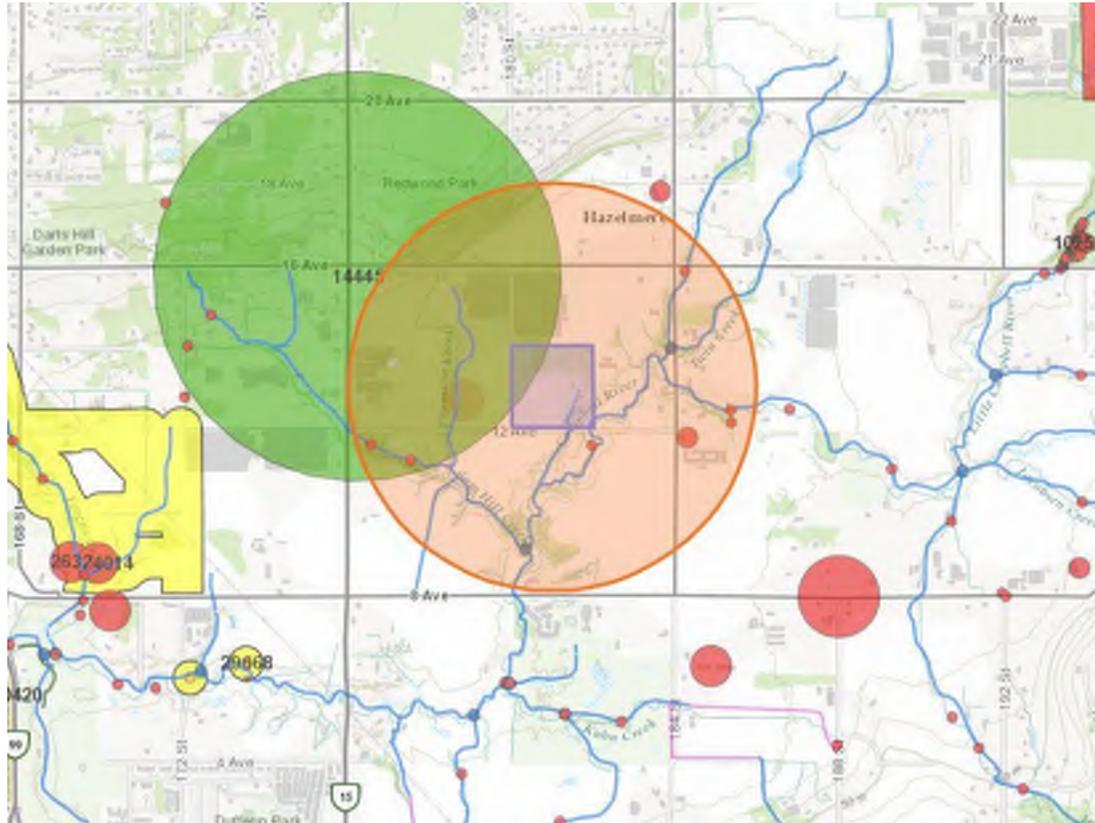
Surrounding properties in this area are all also zoned for general agricultural use (A1), with the properties to the east and west both being utilized for hay and pasture. The banks of the Campbell River, on and off of the property, are lined with tree and shrub species, however to the south of 12<sup>th</sup> Avenue (downstream of the property), this woody vegetation becomes sparse and the Campbell River Green Infrastructure Network buffer of 50 meters is not being well maintained.

## **5 Site Desktop Review**

### **5.1 Rare Ecological Communities and Wildlife**

Included in our desktop review are results of online searches including BC Species and Ecosystems Explorer, Habitat Wizard, City of Surrey Online Mapping System (COSMOS), and COSEWIC. We utilized a 1 km search radius to identify recorded occurrences that may be affected by any future developments on the properties.

Figure 2 shows a summary of the search results for known species or ecosystems at-risk. Red dots in Figure 2 denote occurrences of coho salmon (*O. kisutch*), threespine stickleback (*G. aculeatus*), cutthroat trout (*O. clarkii*), rainbow trout and steelhead (*O. mykiss*), chinook salmon, prickly sculpin and western pearlshell mussels (*Margaritifera falcate*) in Campbell River, as well as in its tributaries (Sam Hill Creek and Twin Creeks). Occurrences indicate exact locations of fish species that were caught; the Campbell River is known to be existing habitat to many other fish species (see Section 4.2).



**FIGURE 2. SCREENSHOT OF CDC AND FISH HABITAT DATA (2019).**

Purple square shows property, and orange circle shows 1km search radius from the property.

Habitat Wizard showed that there is an occurrence of Henderson's checker-mallow (*Sidalcea hendersonii*; green polygon in Figure 2), which is provincially blue-listed. This vascular plant was not seen on the property during the June 2018 field survey, however the particular occurrence notes that the population was found within a 'wet roadside ditch'. Henderson's checker-mallow has conspicuous pink blooms on tall stalks, which would have been potentially in bloom at the time of the survey of the roadside ditch at the frontage of the property. The proposed streamside protection setbacks should provide protection to the property's ditch system, which would be the most appropriate habitat for this species within proximity to the development.

The property is located approximately 1.6 km east of a critical habitat polygon for the Pacific water shrew (*Sorex bendirii*, the yellow stream polygons in Figure 2). The Pacific water shrew is red-listed in BC, with a COSEWIC status of "E" (for Endangered) and a Global Conservation Status of G4 (apparently secure). This indicates that, while the Pacific water shrew is secure globally, it is facing imminent extirpation within the province.

The official Recovery Strategy for the Pacific water shrew indicates that removal of riparian vegetation and woody debris, as well as alteration of water courses (e.g. ditching, culverting) and release of pollutants (e.g. herbicide/pesticide and agricultural run-off) into the riparian systems are key issues causing destruction of critical habitat (SARA, 2014). Currently, none of these potentially negative activities are being considered since the current plans are limited to building a new family home outside of the streamside areas. However, as the property will be used for agricultural use, it is important to consider the effects of agricultural run-off and herbicide / pesticide application, as these are persistent pollutants that can move downstream over time. By adhering to the proposed streamside setbacks and being conscientious of the topography of the landscape, the landowner can provide ample protection for all downstream Pacific water shrew habitats in the future.

Approximately 3 kilometers downstream Campbell River there are documented occurrences of the provincially red-listed and federally endangered Salish Sucker (*Catostomus catostomus* ssp.). Salish Sucker have been found throughout the Campbell River watershed, therefore it is likely this species would be found within the section of this watercourse that cuts across the corner of the property. As outlined in the official Species At Risk Act (SARA) Recovery strategy for Salish Sucker, essential features of habitat for this species includes a water depth of 40-70cm with continuous flow for a minimum of 50 meters, and gravel or cobble substrate for spawning (SARA, 2016). These features are not present in the well-vegetated roadside ditch (Ditch 1), or the stretch of marshy wetland that connects the upper reaches of the pond and associated stream to the north. Additionally, a mad-made berm isolates the pond from the marshy area that would otherwise connect it to Ditch 1. A narrow pipe allows for drainage of pond overflow into the marsh below when flow is extremely high. The width and slope of this culvert create a barrier to fish passage, thus isolating the pond and the channels that feed it. Adherence to the streamside setbacks outlined in Section 6.3 of this report will provide the necessary habitat protection for this species.

Several old buildings were noted on the property during the site visit on July 18<sup>th</sup> 2018. Barn Owls (*Tyto alba*), a species that provincially red-listed (endangered) and classified as threatened under SARA, commonly use old agricultural buildings as nest/rooting sites (Ministry of Environment, 2014). A search of Habitat Wizard in January 2019 (report revision) identified instances of Barn Owl (*Tyto alba*) within the 1km search buffer of the property (red circular polygons, located off of watercourse lines). The landowner has indicated the old buildings were being used to provide shelter to horses by the previous owners of the property. Upon taking ownership of the land, the current landowners cleaned the structures and they are currently in use to house horses and poultry. No Barn Owls were observed by the QEP during the site visit or by the landowner since taking

ownership of the property. Should the landowner plan to renovate or demolish these structures in the future, we would advise an assessment to confirm that the buildings are not being used as Barn Owl nesting sites at that time.

Bald Eagles have been nesting on the property and a nest management plan is attached. Their nests are more than 100 m from the proposed residence. Activity buffers are most relevant to the farm use close by, but also may be applicable near the residence at certain times of the year.

## 5.2 Streamside Areas

A search of FISS reports showed that Campbell River (Watershed Code: 900-000500) is a natural stream system, which runs across the southeast corner of the property. It has known occurrences of chinook salmon (*Oncorhynchus tshawytscha*), chum salmon (*O. keta*), coho salmon (*O. kisutch*), pink salmon (*O. gorbuscha*), coastal cutthroat trout (*O. clarki clarki*), westslope cutthroat trout (*O. clarki lewisi*), kokanee and sockeye salmon (*O. nerka*), rainbow trout and steelhead (*O. mykiss*), dolly varden (*Salvelinus malma*), brassy minnow (*Hybognathus hankinsoni*), brown catfish (*Ameiurus nebulosus*), coastrange sculpin (*Cottus aleuticus*), fathead minnow (*Pimephales promelas*), flathead chub (*Platygobio gracilis*), lake lamprey (*Entosphenus macrostomus*), prickly sculpin (*Cottus asper*), pumpkinseed sunfish (*Lepomis gibbosus*), redbelt shiner (*Richardsonius balteatus*), Salish sucker (*Catostomus* sp. cf. *catostomus*), signal crayfish (*Pacifastacus leniusculus*), slimy scuplin (*Cottus cognatus*), threespine stickleback (*Gasterosteus aculeatus*), and western pearlshell mussel (FISS, 2018).

The watercourse that runs more through the center of the property (Stream 2) is a tributary to the Campbell River, running south and joining in the southern neighbouring property. Although the tributary does not have any documented fish occurrence, its surface connections with Campbell River indicate that it is possible that fish may be present in the lower reaches. A manmade berm isolates the pond and upper reaches of Stream 2 from the marshy area that connected this watercourse to the fish-bearing Campbell River. However, a narrow galvanized steel culvert allows for drainage of the pond into the marshy area to the south when water levels are extremely high. This culvert is sloped at a steep gradient that would inhibit fish passage; however, since these manmade features could be easily removed to reinstate historic flow, Stream 2 is also considered fish-bearing.

## 5.3 Green Infrastructure Network Corridors

The CoS has identified the Campbell River as a Green Infrastructure Network (GIN) Corridor, having a 50 meter buffer on either side of the river's location. The purpose of

the GIN is to conserve biodiversity, wildlife travel corridors and fish habitat over time throughout the City. Corridors help to aid the movement of wildlife to larger hubs, such as parks or ecological reserves throughout the Lower Mainland. Therefore, in addition to our Streamside Protection setbacks, we will be considering the Campbell River corridor as a protected area that will also require protection from development activities.



**FIGURE 3. GREEN INFRASTRUCTURE NETWORK (GIN)**  
Area is shown as the green 50 meter buffer surrounding Campbell River. This is a CoS GIN Corridor, which should be protected from all development activities.

## 6 Field Methods

One QEP from Madrone visited the property on June 19<sup>th</sup>, 2018 to conduct an environmental survey. The property was walked by Angela Doiron (QEP, R.P.Bio.) starting from 12<sup>th</sup> Avenue, walking westward along the road (south property extent) to observe the ditches associated with the property, and then north along the tributary to Campbell River. After the tributary was assessed, the portion of Campbell River that runs across the southeast corner of the property was assessed as well.

The top of bank (TOB) along all watercourses were flagged with blue flagging tape. The QEP measured widths and slopes of the watercourses, and also made vegetation, land use, wildlife habitat, and wildlife observations. The watercourses encountered on the property were walked and geo-referenced for their full length on the property, photos were taken and the area mapped.

## 7 Site Visit Results

### 7.1 Wildlife Observations

No active bird nests were noted during the site visit, and it is not anticipated that any clearing of the land will occur as a result of the proposed development. However, if any clearing of shrubs, trees or tall grasses occur within the breeding bird window (March 15<sup>th</sup> – September 1<sup>st</sup>), an additional survey must be completed by a QEP to determine if any nests are present **prior to clearing**. This is particularly important for the removal of any existing structures on the property as well, as Barn Swallows (*Hirundo rustica*) were observed foraging on the property and may be using the older buildings on the property for nesting opportunities.

**TABLE 1 WILDLIFE SPECIES OBSERVED ON THE PROPERTY DURING SITE VISIT**

Common Name	Scientific Name	CDC Ranking
Blue-winged Teal	<i>Spactula discors</i>	Yellow (Secure)
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	Yellow (Secure)
American Robin	<i>Turdus migratorius</i>	Yellow (Secure)
Mallard	<i>Anas platyrhynchos</i>	Yellow (Secure)
American Goldfinch	<i>Spinus tristis</i>	Yellow (Secure)
Bald Eagle <sup>1</sup>	<i>Haliaeetus leucocephalus</i>	Yellow (Secure)
Turkey Vulture <sup>1</sup>	<i>Cathartes aura</i>	Yellow (Secure)
American Crow	<i>Corvus brachyrhynchos</i>	Yellow (Secure)
Barn Swallow <sup>1</sup>	<i>Hirundo rustica</i>	Blue (At Risk)

Note: 1. Flying overhead, foraging

Barn Swallows are blue-listed (at-risk) due to declining populations and their dependence on old buildings, cavernous areas or the underside of roofs and decks to build their nests. The main factors that have been identified in the Barn Swallow Recovery Strategy document have been identified as loss of nest site habitat, loss or degradation of foraging habitat, pesticide use and pollution, human persecution at roost sites, and severe weather (Heagy *et al.*, 2014). Therefore, if active nesting sites are located within the old buildings, it is recommended that additional structures be placed on the property away from human activity, to provide alternative nesting areas for these birds.

No amphibians or amphibian signs were observed at the time of the survey; however they are likely present because ideal riparian habitat exists for several species including habitat for red-legged frogs (*Rana aurora*), which are blue-listed.

Bald Eagles were observed nesting by Liz Shebib and Laurie Kremsater during subsequent visits.

## **7.2 Streamside Areas Descriptions**

### **7.2.1 Ditch 1 (12<sup>th</sup> Avenue)**

The frontage ditch, which runs west-to-east along the north side of 12<sup>th</sup> Avenue, flows from beyond the western boundary of the property and empties into Stream 2 (the tributary to the Campbell River), just to the east of the road access to the west field. At this crossing, the ditch enters a 600 mm culvert, which connects the ditch with Stream 2 before it flows into a large culvert under 12<sup>th</sup> Avenue and carries on southward.



**PHOTO 1. VIEW WEST ALONG 12TH AVENUE, SHOWING UPSTREAM VIEW OF DITCH 1.**

The ditch (which was dry at the time of the survey) was relatively small, having an average bankfull width of 1.5 meters and an average depth of 1.2 meters from top of ditch bank. Thus, the ditch is an incised drainage feature that has very steep, but very well vegetated, banks. Although the ditch banks are steeply sloped, the gradient of the ditch itself was

relatively gentle, ranging from 1% along the west field to 4% before it joins with Stream 2. Although the culvert joining the ditch with the fish-bearing Stream 2 is somewhat hanging, it is possible that fish may make their way up the ditch during the wet seasons of the year, and therefore it is not possible to call Ditch 1 'non-fish bearing'. We suggest the classification be changed from its current designation as a class "B" (non-fish-bearing) to a class A/O (potentially fish-bearing in winter).

The vegetation community along the banks of Ditch 1 is comprised of a remarkably dense amount of native vegetation, which includes Nootka rose (*Rosa nutkana*), snowberry (*Symphoricarpos albus*), willows (*Salix* spp.), cascara (*Rhamnus purshiana*), black cottonwood (*Populus trichocarpa*), pink spiraea (*Spiraea douglasii*), bluejoint grass (*Calamagrostis canadensis*) and common horsetail (*Equisetum arvense*). The density of the shrub layer (particularly along the north bank of the ditch) provides excellent isolation of the ditch from the property itself, and should be kept intact by the Streamside Protection Area.



**PHOTO 2. VIEW EAST (DOWNSTREAM) ALONG DITCH 1. THE DITCH WAS DRY AT THE TIME OF THE SURVEY.**

Non-native vegetation present mostly existed on the road side of the ditch (i.e., the south bank), as would be expected due to the potential for vehicles to carry invasive vegetation seeds in their wheel wells, the presence of non-native substrate (such as gravel) and the higher salinity of roadside areas. Invasive vegetation on the ditch includes reed canary grass (*Phalaris arundinacea*), tall buttercup (*Ranunculus acris*), alsike clover (*Trifolium hybridum*),

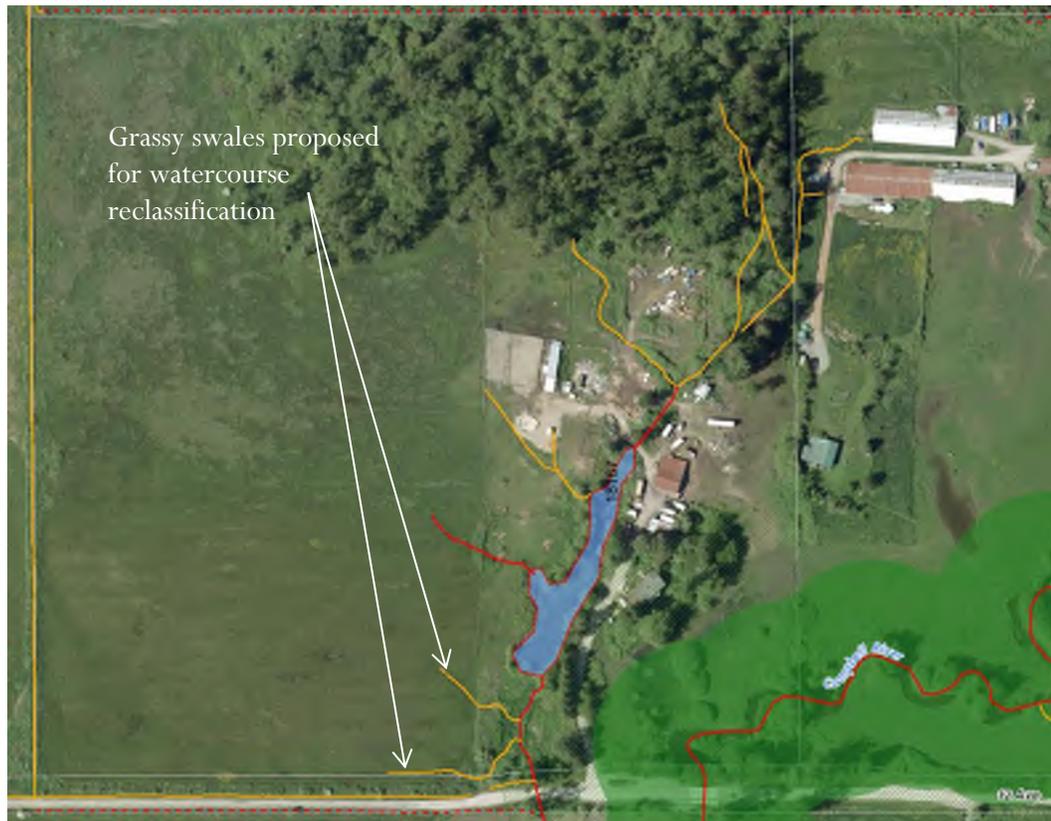
Kentucky bluegrass (*Poa pratensis*), common dandelion (*Taraxacum officinale*), common plantain (*Plantago major*), apple trees (*Malus* sp.), yellow iris (*Iris pseudacorus*), ribwort plantain (*Plantago lanceolata*), yellow hawkweed (*Hieracium caespitosum*) and infestations of Himalayan and cut-leaf blackberry (*Rubus armeniacus* and *Rubus laciniatus*, respectively).

### 7.2.2 Swales feeding Stream 1 and Stream 2

The desktop review of the property revealed that several drainages on the western field have been identified as Class B watercourses (significant source of food/nutrients; but no fish present) by the CoS. All of these channels presumably flow into the tributary to the Campbell River (i.e., Stream 2). However, while on the property, Angela did not identify these areas as being streams with any defined channels. All of these areas, save for one, were identified as grassy swales. Although Angela had suggested these swales should be reclassified from Class B watercourses to Class C watercourses (insignificant food/nutrient value; no fish present), subsequent work in and around the watercourses has re-defined those channels and water was seen flowing in some during winter. Only two of the swales/channels are suggested for re-classification from their original Class B classification to class C (Figure 4).



**PHOTO 3. NORTH VIEW ALONG EXISTING UNIMPROVED VEHICLE TRAIL, SHOWING ONE OF THE GRASSY SWALES ON THE PROPERTY. THESE SWALES WERE DETERMINED TO NOT BE STREAMS.**



**FIGURE 4 COS MISCLASSIFIED WATERCOURSES**

Watercourses suggested for reclassification from Class B watercourses (significant food/nutrient value; no fish present) to Class C watercourses (Insignificant food/nutrient value; no fish present).

### **7.2.3 Stream 1 (Tributary to Stream 2)**

There was one seasonal watercourse (Stream 1) that was identified due to its obvious channel and hydrophytic vegetation community. The channel of Stream 1 begins in the west field, with just a slight dip in topography allowing for some runoff to gather and move down the channel, which was dry at the time of the survey. The water in Stream 1 flows west-to-east down the gentle topography of the field (0-1% gradient), where it flows under a large snare of Himalayan blackberry before flowing down a steep embankment (15-20% gradient) and into the pond that is associated with Stream 2.



**PHOTO 4. NORTHEAST VIEW ACROSS STREAM 1, WHICH HAS HYDROPHYTIC VEGETATION. FROM HERE, THE STREAM ENTERS THE POND ASSOCIATED WITH STREAM 2.**

The western half of Stream 1 is located within a hay field, and is vegetated with invasive and noxious weed species such as tall buttercup, slender wheatgrass (*Elymus trachycaulus*), brome species (*Bromus* sp.), lamb's quarters (*Chenopodium album*), field bindweed (*Convolvulus arvensis*), flixweed (*Descurainia sophia*), curled dock (*Rumex crispus*), scentless chamomile (*Matricaria maritima*), Canada creeping thistle (*Cirsium arvense*), creeping buttercup (*Ranunculus repens*) and reed canary grass. As the stream flows down the slope into the pond on the property, it becomes vegetated with more wetland species, such as willows, broad-leaf water plantain (*Alisma plantago-aquatica*), Baltic rush (*Juncus balticus*), water sedge (*Carex aquatilis*), water smartweed (*Polygonum amphibium*), red alder (*Alnus rubra*), black cottonwood, and black twinberry (*Lonicera involucrata*).

Stream 1 currently is classified as a Class A stream on COSMOS, but its seasonal flow suggests it should be a class A/O or even a Class B stream in the hay field portion. Because it is a natural watercourse that existed prior to September 12 2016, it would receive a 15 m buffer regardless of whether it was considered A, A/O or B.

#### **7.2.4 Stream 2 (Tributary to Campbell River)**

Stream 2 receives water from northeast of the property, collecting drainage from the forested headwaters on the neighbouring property. The stream was originally thought to

be is disconnected at its northern end by a road crossing without a culvert; however there is a buried culvert and water manages to seep under the road. Fish may not be able to reach upstream, but could if the culvert was clear. South (downstream) of the bisecting road there is another stream crossing that has a 600 mm culvert in place. This culvert has an outlet into a long pond feature (Pond 1) on the property, which has permanent open water habitat for waterfowl and songbirds. The current classifications on COSMOS appear correct (Class B: significant source of food/nutrients; but no fish present above the road, and Class A: fish-bearing, below the road).



**PHOTO 5. VIEW NORTHWEST (DOWNSTREAM) WITHIN STREAM 2. IN THE BACKGROUND, A ROAD CROSSING WITH NO CULVERT IS VISIBLE. THIS ROAD CROSSING HAS BIASECTED THE STREAM, CAUSING IMPOUNDMENT OF DRAINAGE.**

Stream 2 has sluggish flow, with a gradient of 0%, and thick organic soils. North of the pond, the stream was dry at the time of the survey. The pond, although lower than its usual high-water mark, was barely depleted at the time of the survey, and as a result the reed canary grass marsh south of the pond (pond 1) was well saturated. Pond 1 appears to have been created by a berm to dam the water at the south end. The water level is limited by a galvanized steel culvert which allows excess water to escape into the grassy marsh area and flow downstream. There is quite a steep slope on this culvert (approx. 4' drop over 20' of length) so water flows down rapidly in a thin stream when it runs. No fish could swim up the culvert, but we don't consider culverts to be fish barrier because they could be removed to reinstate fish passage. If the culvert was removed, the pond would

deplete, and a more channelized watercourse would be re-created. Given potential fish presence, the pond has setbacks of 15 m.

Past the grassy marsh associated with Stream 2, the water becomes more channelized again and continues to flow south, where it joins with Ditch 1 before entering a culvert under 12<sup>th</sup> Avenue.

Stream 2 has relatively well-vegetated banks; however the riparian area has been thinned out quite drastically on the east bank. Here, previous landowners used much of the riparian area as a parking zone, and cement blocks are still in place all along the top of the bank. Heavy disturbance to the vegetation and hydrology of Stream 2 has resulted in large infestations of Himalayan and cut-leaf blackberry, reed canary grass, lamb's quarters, field bindweed, flixweed, curled dock, scentless chamomile, Canada creeping thistle, tall buttercup, creeping buttercup, common plantain, yellow iris and common dandelion. The wet western banks of the pond area still have some native vegetation, housing common cattail, sedge species (*Carex* spp.), broad-leaf water plantain, Baltic rush, common spike-rush (*Eleocharis palustris*), willows, black cottonwood, red alder, western redcedar (*Thuja plicata*), black twinberry, Douglas-fir (*Pseudotsuga menziesii*), Nootka rose and snowberry.



**PHOTO 6. EAST VIEW OF STREAM 2'S SHRUB COMMUNITY, COMPOSED OF NOOTKA ROSE, WILLOW AND HIMALAYAN BLACKBERRY.**



**PHOTO 7. EAST VIEW ACROSS THE POND ASSOCIATED WITH STREAM 2.**

### 7.2.5 Stream 3 – Campbell River and Associated Marsh

Stream 3 (the Campbell River) is a known fish-bearing watercourse, which flows northeast-to-southwest across the landscape, entering the property at its eastern boundary and curving to flow under 12<sup>th</sup> Avenue at its southern boundary. During the field visit, salmonids were seen in the river, although species identification was not possible.



**PHOTO 8. VIEW SOUTHWEST OF CAMPBELL RIVER (STREAM 3) AS IT RUNS THROUGH THE SOUTHEAST CORNER OF THE PROPERTY.**

Note undercut banks and blackberry infestation.

Currently, Stream 3 and its wetland are well vegetated and provide essential flood protection for the Campbell River and its GIN Corridor. The Campbell River has deeply incised banks at its location on the property, which are undercut in many areas. These banks are densely vegetated with infestations of Himalayan blackberry, common tansy (*Tanacetum vulgare*) and reed canary grass.

As the river winds its way across the southeast corner of the property, the banks become less incised and the ground directly beside the river becomes much more saturated, resulting in a seasonal marsh wetland. The wetland is dominated by yellow iris, but has associated shrubby vegetation such as willows and pink spirea.

The Campbell River is a natural, fish-bearing watercourse and requires a 15 m buffer.



**PHOTO 9. NORTHEAST VIEW OF DENSE INVASIVE SPECIES COMMUNITY THAT SURROUNDS STREAM 3.**



**PHOTO 10. VIEW NORTH FROM THE BANK OF THE CAMPBELL RIVER, SHOWING ITS ASSOCIATED SEASONAL MARSH.**

### **7.3 Streamside Setback Requirements**

A search of the lot information for 18167 12<sup>th</sup> Avenue revealed that the lot was established in 1972 (prior to 2016). Therefore, the minimum streamside setback areas from Zoning Bylaw 1200 Part 7a.B.2 will be used to determine the appropriate buildable envelope for this lot, where the GIN for the Campbell River does not overlap. Under this section, all stream types (except ditches) have a minimum setback of 15 meters from the top-of-bank (TOB). Ditches that are classified as A/O receive a 10 m setback and Class B ditches receive a 7 m setback. The ditch at the frontage of the property will require a 10 meter setback from the TOB, as it was found to be a Class A/O ditch in the field rather than a Class B ditch (i.e., potentially inhabited by salmonids during overwintering periods with potential access enhancement; direct surface connection to a fish-bearing stream via a hanging culvert). Note that the classes of both streams and ditches were determined in the field by examining connectivity for fish and by utilizing the CoS Fish Class Watercourse Layer (COSMOS, 2017).



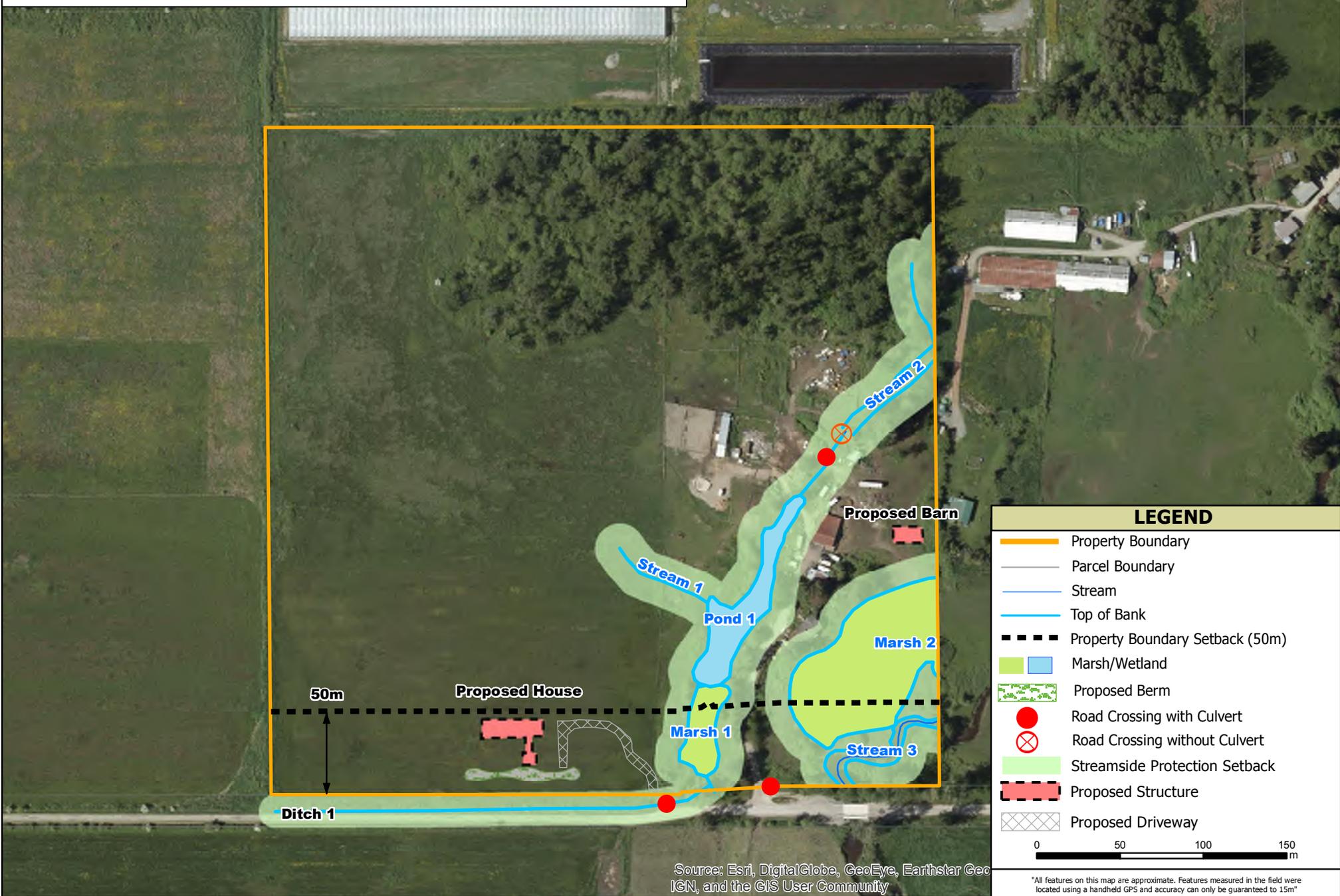
**PHOTO 11. VIEW WEST ACROSS THE WESTERN FIELD ON THE PROPERTY, SHOWING POTENTIAL BUILDING LOCATION.**

Figure 5 shows the streams present on the property, as well as their associated CoS Streamside Setback Areas. These streamside setback area buffers act as boundaries, which cannot be developed, used for storage, or disturbed in any way. Figure 6 shows the same setbacks, but with the additional GIN Corridor setback for the Campbell River. The buffer is a measurement of 50 meters, taken from the observed TOB of the Campbell River (i.e., Stream 3). Both buffers will need to be protected from further development activities.



<b>PROJECT:</b> Ecosystem development Plan: 18167 12th Avenue	<b>LOCATION:</b> Surrey, BC	<b>CLIENT:</b> Isidore Landscapes Inc.	<b>DOSSIER:</b> 18.0252	
<b>ASSESSED BY:</b> Angela Doiron, B.Sc., R.P.Bio	<b>FIELD VISIT:</b> June 19, 2018	<b>MAP SCALE:</b> 1:3,000	<b>MAPPING DATE:</b> July 16, 2018	

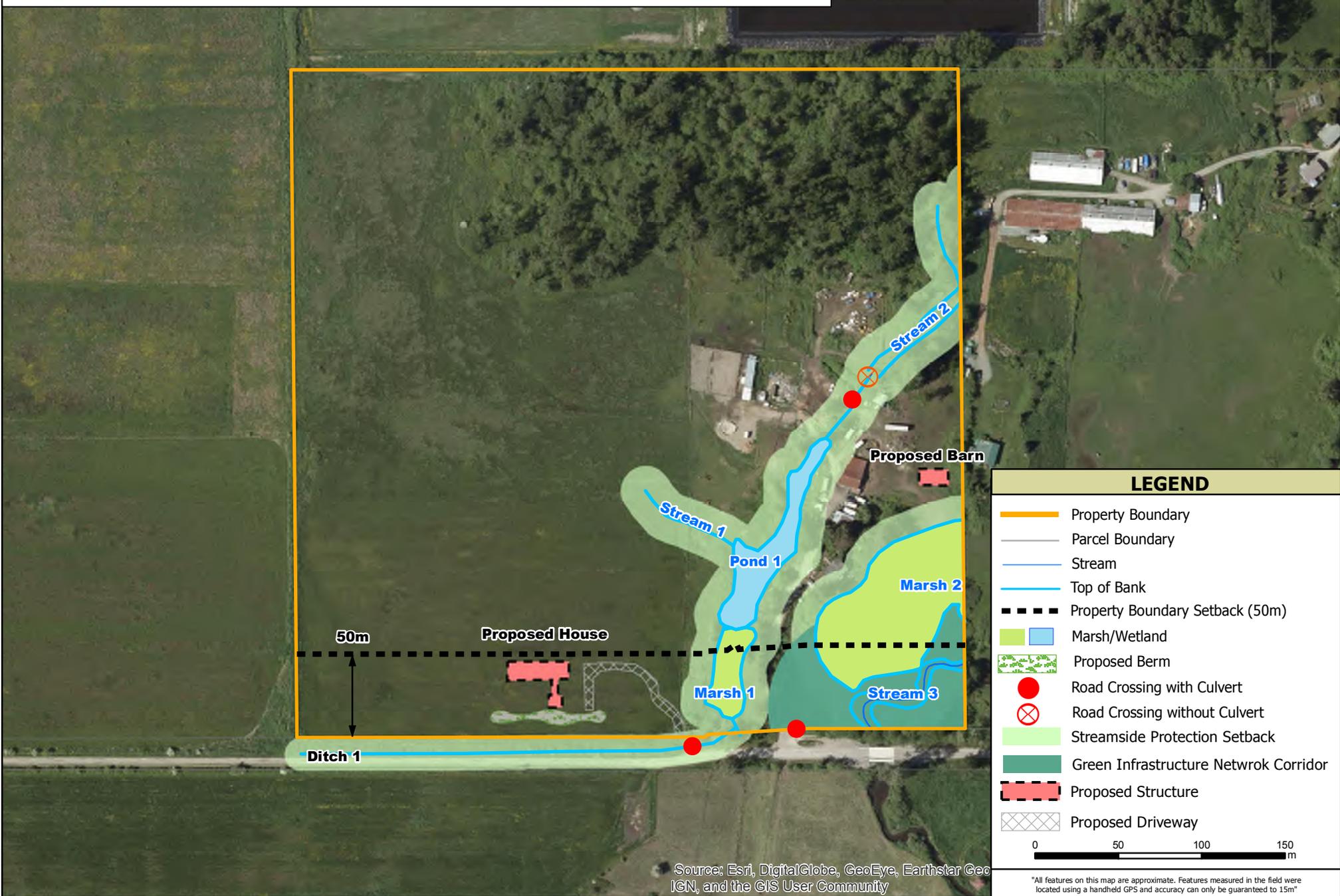
**FIGURE 5:** Summary of Streamside Protection Setbacks for 18167, 12th Avenue





<b>PROJECT:</b> Ecosystem development Plan: 18167 12th Avenue	<b>LOCATION:</b> Surrey, BC	<b>CLIENT:</b> Isidore Landscapes Inc.	<b>DOSSIER:</b> 18.0252	
<b>ASSESSED BY:</b> Angela Doiron, B.Sc., R.P.Bio	<b>FIELD VISIT:</b> June 19, 2018	<b>MAP SCALE:</b> 1:3,000	<b>MAPPING DATE:</b> July 16, 2018	

**FIGURE 6 :** Summary of Recommended Setbacks from Streamside and Green Infrastructure Areas



Source: Esri, DigitalGlobe, GeoEye, Earthstar GeoIGN, and the GIS User Community

\*All features on this map are approximate. Features measured in the field were located using a handheld GPS and accuracy can only be guaranteed to 15m"

## 7.4 Ecosystems Present

One of the goals of the site survey was to gain a general understanding of the Environmentally Valuable Resources (EVRs) on site. Table 2 lists all EVRs inventoried during the site reconnaissance. Note that recognized RISC (Resources Information Standards Committee) standards were not completed for each EVR. This was due, in part, to the scope of the report (reconnaissance level), and the required survey effort (often RISC standards require multiple site visits). The survey consisted of one registered professional biologist (R.P. Bio.) walking on-foot, recording all the relevant wildlife, ecosystems and habitats observed.

**TABLE 2-LIST OF ENVIRONMENTALLY VALUABLE RESOURCES ON OR NEAR PROPERTY**

<b>Terrestrial Ecosystems in a relatively unmodified state</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
Conifer-dominated older forest (>100 yrs)		X	A dense shrub community lines the frontage ditch system (Ditch 1). Remaining shrubby vegetation surrounding Stream 2 and Stream 3 are providing a vestige of privacy for wildlife and bank stabilization.
Conifer-dominated second-growth (60-100 yrs)		X	
Grassland/shrub/herb communities	X		
Coastal bluffs		X	
Sparsely vegetated		X	
Cliffs/rock faces / talus slopes		X	
<b>Ecosystems at Risk</b>			
Red or Blue-listed Ecological Communities		X	Campbell River GIN Corridor & Tributaries to Campbell River.
Sensitive ecosystems	X		
Areas identified as environmentally sensitive areas by local governments	X		
<b>Aquatic or riparian ecosystems</b>			
Seasonal / permanent watercourses	X		Stream 2 has an associated pond and marsh system where the stream is impounded by 12th Avenue. Campbell River has a floodplain with marsh attributes.
Seasonal / permanent wetlands	X		
Groundwater springs and seepages / vernal pools		X	
Lakes or ponds	X		
Riparian ecosystems	X		
Vegetated gullies		X	

## 7.5 Wildlife Trees and Coarse Woody Debris

The property has been cleared historically for agricultural use and therefore no large trees, snags or coarse woody debris are present. The exception is at the northern extent of the property where a large forested block provides potential nesting habitat for breeding birds. If possible, these trees should be kept for their wildlife habitat potential. If any trees need to be removed from the property, the landowner is advised that a Tree Permit will be required for all trees exceeding 30 cm DBH. All trees and shrubs located within the Streamside Protection Areas are protected from removal, unless a certified Arborist

confirms the presence of a danger tree. If a danger tree is removed in the future, the remains of the tree should be placed within the Streamside Protection Area for nutrient cycling and to provide potential coarse woody debris habitat for small mammals and amphibians.

## **7.6 Wildlife Mineral Licks**

No wildlife mineral licks were observed during field studies.

## **7.7 Nesting and Denning Sites**

During the first site visit, no active bird nests were observed; however an exhaustive bird nest survey was not completed. Subsequent site visits identified the Bald Eagle nest as active. In the area of the house site, vegetation is grass and shrubs and the shrubs are not likely to need to be touched for house construction. Nonetheless a bird nest survey would be required if clearing on the property occurs between March 1<sup>st</sup> and September 1<sup>st</sup>. a

As mentioned previously, old buildings on the property may provide potential habitat for bats or Barn Swallows and as such appropriate wildlife surveys should be completed prior to the alteration of any of these buildings. If nesting sites are found at that time, Madrone would be able to provide guidance on relocation sites for nests or habitat compensation plans. No active nests may be disturbed.

No dens were observed during the site visit.

## **7.8 Monitoring Guidelines and Best Management Practices**

### **7.8.1 Best Management Practices for Development**

In the event that the CoS confirms that a Sensitive Ecosystems Development Permit can be awarded, the Streamside Setback Area and Green Infrastructure Network boundaries will need to be safe-guarded from any construction activities (i.e. vegetation removal, soil disturbance of any kind, temporary or permanent storage, etc.). These buffers will need to be delineated according to our assessment findings and measured out by a certified surveyor from the top-of-bank of each of the streams.

Prior to the start of work on the property to build the new single-family home and gravel driveway, the landowner should undertake several mitigatory actions to ensure that no contravention to provincial or municipal bylaws occur. For example:

- An Arborist should be employed to ensure that driplines of trees within proximity to the proposed footprints are protected with orange snow fencing and/or application of woody mulch materials.
- Invasive species management would be highly beneficial, particularly where Himalayan blackberry infestations have become problematic.
- If vegetation clearing of any kind (e.g. shrubs, trees or low vegetation such as grasses) occurs during the breeding bird season (March 1st to September 1st), a breeding bird survey must be conducted by a qualified environmental professional to ensure adherence to the Federal Migratory Birds Convention Act, Federal Species at Risk Act, and the Provincial Wildlife Act.
- Developer may need to refer to Part VIII Floodproofing of “Surrey Zoning By-law, 1979, No. 5942” to ensure that their new development will be up to code and municipal standards.
- We recommend the property owner adhere to all relevant Provincial Guidelines, Best Management Practices (BMPs) and Recovery Strategies. We have summarized the main recommendations in this document, but details can be found in the related bullet below.

If the below-listed BMPs, Recovery Strategies, and recommendations are followed, it is unlikely that there will be a significant negative impact of development on EVRs.

- Develop with Care 2014: Environmental Guidelines for Urban and Rural Land Development in British Columbia
- Riparian Areas Regulation Streamside Protection and Enhancement Areas Guidelines and Implementation Guidebook (2005)
- Guidelines for Amphibian and Reptile Conservation during Urban and Rural Development in British Columbia (2014)

A fence will need to be erected to safeguard the march and stream 1. The fencing costs around the new house and driveway were addressed under the habitat restoration plan and were costed at \$7,200 (for 90m of split rail fence at \$80/m). Those costs were included with securities for habitat restoration and should not be required to be paid again. There is no planting required as the ditch crossing already exist so that the driveway extension and new home will not affect riparian vegetation.

## **8 Monitoring**

The goal of monitoring is to ensure that no serious harm occurs to EVRs (i.e. sensitive ecosystems) as a result of the development. Because this is a preliminary field assessment without a development permit, and development plans are not yet confirmed, we cannot be specific about monitoring requirements. Generally, we suggest that monitoring include the following steps:

### **8.1 Specific Actions Required:**

- Review the Environment Site Assessment report, and ensure all recommendations are implemented by a QEP such as an R.P.Bio;
- Establish appropriate buffers around the Streamside Setback Areas and Green Infrastructure Network Corridor as non-developable areas, to be temporarily fenced off with high-visibility orange snow fencing as follows:
  - Ditch 1 – a 10 meter Streamside Protection Area from TOB;
  - Stream 1 and 2 – a 15 meter Streamside Protection Area from TOB; and
  - Stream 3 – a 50 meter Green Infrastructure Network setback from the TOB.
- Ensure driplines of trees along Stream 2 have been properly protected, particularly during driveway construction;
- Ensure development plans also have monitoring recommendations and that they are followed prior to the start-up of construction;
- Complete on-site monitoring visits prior to any vegetation clearing during the breeding bird season;
- Ensure no additional clearing outside of the designated areas occurs; and
- Complete a final site visit to ensure that all measures were implemented as recommended.

### **8.2 Monitoring Schedule:**

- An initial pre-construction meeting would be held to discuss the development plans and recommendations. It is expected that an open dialogue would be maintained

between the qualified environmental professionals and the developer prior to any developments occurring on the site;

- Depending on the time of year (e.g., breeding bird season), specific surveys must be conducted prior to any vegetation clearing; and
- A final site visit would be completed at the end of each development phase to ensure that all measures were adhered to.

### **8.3 Communication Plan:**

- The developer will contact the QEP to initiate monitoring;
- The developer will maintain open communication with the qualified environmental professionals prior to development occurring on the ground, and also during on-site activities. This will allow for site visits to be made throughout the development process and for modifications to be made, where necessary; and
- Upon completion of the development, the developer will contact the qualified environmental professional to allow for the final site inspection to be carried out.

### **8.4 Post Construction Report:**

- As part of the monitoring process, a report that documents all construction activities would be required. The report would contain a chronological break down (with site photos) of all development activities and describe compliance to the various measures.

## 10 Closure

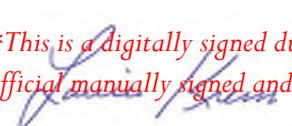
It is my recommendation that, as long as the CoS's Streamside Setback Areas and Green Infrastructure Network boundaries for the Campbell River and its tributaries are respected, it will be possible to construct a single-family home and associated gravel driveway at 18167, 12<sup>th</sup> Avenue while still maintaining the integrity of the fish-bearing watercourses and their riparian habitat, and the integrity of Green Infrastructure Network.

If you have any questions, please do not hesitate to contact the undersigned.



Liz Shebib, BSc.  
Junior Ecologist

*\*This is a digitally signed duplicate of the official manually signed and sealed document.*



Laurie Kremsater, M.Sc., R.P.F., R.P.Bio.  
Senior Habitat Ecologist

Revising report of



Angela Doiron, B.Sc., R.P.Bio.  
Project Biologist

**MADRONE ENVIRONMENTAL SERVICES LTD.**

## 11 References

- BC Conservation Data Centre. 2018. BC. Species and Ecosystems Explorer. B.C. Ministry of Environment, Victoria B.C. <http://a100.gov.bc.ca/pub/eswp/> (accessed June 18, 2018).
- B.C. Ministry of Environment. 2014. Recovery Plan for the Barn Owl (*Tyto alba*) in British Columbia. Prepared for the B.C. Ministry of Environment, Victoria, BC. 30 pp.  
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[https://www.registrelep-sararegistry.gc.ca/virtual\\_sara/files/plans/Rs-SalishSucker-v00-2016Sept06-Eng.pdf](https://www.registrelep-sararegistry.gc.ca/virtual_sara/files/plans/Rs-SalishSucker-v00-2016Sept06-Eng.pdf)
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- Ministry of Environment. 2014. Develop with Care: Environmental Guidelines for Urban and Rural Land Development in British Columbia.  
<http://www.env.gov.bc.ca/wld/documents/bmp/devwithcare/index.html>
- Ministry of Environment. 2014. Guidelines for Amphibian and Reptile Conservation during Urban and Rural Development in British Columbia.  
[http://www.env.gov.bc.ca/wld/documents/bmp/HerptileBMP\\_complete.pdf](http://www.env.gov.bc.ca/wld/documents/bmp/HerptileBMP_complete.pdf)



## APPENDIX 1

# **52 Point Response for Sensitive Ecosystem Development Permit Guidelines**

Sensitive Ecosystem Development Permit Guideline Responses for 18167 12 ave

	<u>REQUIREMENT</u>	<u>RESPONSE</u>
1a.	Any requirements specified in Riparian Areas Regulation, B.C. Reg. 376/2004, as amended, take precedent over any guidelines listed in this Section.	Fisheries and Oceans Canada will be notified and QEP's assesment report will be sent in accordance with Fish Protection Act, Riparian Areas Regulation , BC Reg 376/2004
1b.	Where a Green Infrastructure Area has been identified, development shall be adjusted to accommodate and be sensitive to the Biodiversity Management Areas, Green Infrastructure Network and the specific conditions and recommendations for protection listed within Surrey's Biodiversity Conservation Strategy	Theres no construction in or nearby the Green Inrastructure Area.
2a.	Construction and post: construction access into a Streamside Protection Area is strictly prohibited, except where permitted by the City of Surrey.	Access will through an existing ditch-crossing access. No additional access will be created.
2B.	No development shall occur within a Green Infrastructure Protection Area that has not been identified, addressed and reviewed by a QEP to the satisfaction of the City of Surrey or that is not consistent with the submitted and approved Ecosystem Development Plan.	Construction is at least 300 feet away from the nearest GIA.
3A	Overall Site: Building construction and site layout adjacent to a Streamside Area shall be done in such a way so as to minimize impacts on the identified Streamside Protection Area. Locate buildings, roadways, parking areas and driveways away from the Streamside Protection Area boundary as far as possible.	Building is as far away as possible, limited by the city requirement to keep the residence in the front 60 metres of the property.
3B	Overall Site: Plan and design on site development roadways and connections to minimize habitat fragmentation and minimize disruption and impedance to wildlife travel.	N/A
4A	Overall Site: Establish buffers large enough to protect the ecological integrity of Sensitive Ecosystem Areas.	Buffer between house and top of bank is over 20 metres.
5A	Overall Site: Avoid locating infrastructure corridors adjacent to or within Streamside Protection Areas. Where it can be demonstrated that alternatives are not possible, design crossings that are narrow and perpendicular, and that minimize disturbance to Streamside Protection Areas.	Driveway through streamside area is narrow and unpaved.

5B	Overall Site: Avoid locating infrastructure corridors adjacent to or within Streamside Protection Areas. Where it can be demonstrated that alternatives are not possible, design crossings that are narrow and perpendicular, and that minimize disturbance to Streamside Protection Areas.	Driveway through streamside area is narrow and unpaved.
6	Overall Site: Determine buffer locations and sizes using contemporary Best Management Practices with the main goal of protecting Sensitive Ecosystem Areas from the effects of development and to retain the integrity of the Sensitive Ecosystem as a habitat and/or riparian	Buffer size is maximized.
7A	Overall Site: Any development adjacent to or within (for approved works and services installations only) a Streamside Protection Area requires the monitoring of conditions, both on and off site, by a QEP prior to, and during construction.	Madrone Environmental Services has been engaged to inspect the monitor.
7B	Overall Site: Any development adjacent to or within (for approved works and services installations only) a Green Infrastructure Protection Area requires the monitoring of conditions, both on and off site, by a QEP prior to, and during construction.	N/A
8	Building and Construction: Minimize impervious surfaces to improve stormwater absorption by using permeable materials and techniques, including permeable pavers and structural grassfields.	Driveway and parking area will be permeable gravel.
9	Trees and Vegetation: Create continuous vegetated corridors, wherever possible, by linking tree retention areas from within the development to that of adjacent Streamside Protection Areas or Green Infrastructure Protection Areas.	No trees will be removed.
10	Trees and Vegetation: In addition to the Areas of Protection, retain as much existing native vegetation and as many trees as possible during site development or redevelopment. Ensure tree replacement ratios are consistent with the requirements identified in Surrey's Tree Protection Bylaw, as amended.	House is located in a hay field. Vegetation other than hay on the building site will not be affected.
11	Trees and Vegetation: Protect trees or existing vegetation within the development site and any trees on adjacent City of Surrey property and/or boulevards, before and during construction, in accordance with Surrey's Tree Protection Bylaw, as amended.	N/A

12	<p>Trees and Vegetation: Landscape the setback areas created between buildings, roadways, parking and driveways and the edge of the Streamside Protection Area or Green Infrastructure Protection Area using native plantings (e.g. trees, shrubs and groundcover) where appropriate. Landscaping should be complementary and supportive of the habitat types and ecosystem values found within the adjacent Streamside Protection Area or Green Infrastructure Protection Area as documented within the Ecosystem Development Plan and/or the Impact and Mitigation Plan.</p>	Planting around the house will be a combo of native and ornamental species.
13	<p>Habitat: Design sites to mitigate light pollution to reduce impacts on those habitat areas reliant on darkness.</p>	Any garden or outdoor lights will be low-voltage.
14	<p>Habitat: Prevent disturbance of animal and bird nesting sites and breeding areas by preserving adequate animal habitat through the retention of appropriate trees and vegetation and by timing construction activity to avoid bird breeding windows.</p>	House is located in a hay field not near any bird nesting area.
15	<p>Habitat: Retain intact aquatic and terrestrial ecosystems and their connectivity to other Sensitive Ecosystem Areas. Preserve large tracts of wildlife habitat or long, continuous corridors in order to facilitate safe and unencumbered movement of wildlife from one place to another. Maintain natural hydrologic cycles in wetlands, ponds, streams and seepage areas to retain biodiversity.</p>	Area to the east with pond and native growth will not be divided.
16	<p>Habitat: Reconnect fragmented ecosystems, where practical and necessary, by establishing and restoring corridors and protecting habitats for isolated species or populations as shown in Surrey's Biodiversity Conservation Strategy</p>	N/A
17A	<p>Habitat: Plan and design development in order to: Protect endangered, threatened, vulnerable species or Species at Risk plant and animal communities. Plan, design and implement land development and subdivisions to protect Sensitive Ecosystem Areas. Prioritize protection for habitats that provide for at risk species, at risk ecological communities and keystone species. Minimize impacts on significant, rare or unique vegetation, wildlife and wildlife habitat.</p>	The only species at risk identified is the barn swallow. Building the house will create possible nest sites.
B	<p>Retain and enhance ecosystem features such as significant trees, hedgerows or windbreaks, with enough undisturbed space around them to protect root systems.</p>	N/A

C	Retain natural landforms such as escarpments, ravines, rock croppings, bluffs, hilltops or cliffs.	N/A
D	Design and implement artificial habitat features, such as nesting boxes or spawning beds, where natural features are not present or practical	House landscape will include planting new trees, boulders and water features which will be attractive to wildlife.
18	Drainage: At a minimum, manage stormwater so that the quantity, quality and rate of stormwater input into receiving streams does not vary from that which existed pre - development. Install both temporary and permanent sediment/pollutant containment and erosion control measures for any development or redevelopment.	An external settling pond/rain garden can be incorporated into the landscape from rainwater from the roof.
19	Drainage: Manage site drainage in accordance with the Integrated Stormwater Management Plan (ISMP) relevant to the site location and with Surrey's Erosion and Sediment Control and Stormwater Drainage Regulation and Charges Bylaws, as amended.	No animals that could cause a rise in fecal coliform levels in LCR will be brought to property as per Little Campbell River ISMP section 14.4 Water Quality and Bethnic Invertebrates, The priority water quality issues listed in order of importance: 1. Fecal Coliforms
20	Drainage: Implement measures that will prevent the release of silt or sediment - laden water into streams and Surrey's drainage network during any activity involving soil disturbance. Manage and mitigate the quality and quantity of stormwater runoff to help protect and enhance aquatic habitat.	No water will be directly discharged into surreys drainage network. Surplus ground water will flow over existing grass field for min 20 metres before reaching city drainage ditch.
21	Drainage: Incorporate rainwater Best Management Practices into development to ensure that post development peak flows do not exceed pre development peak flows by treating, storing, redirecting and slowly releasing rainwater from impervious surfaces back into natural hydrological pathways as much as possible, and by using systems such as green roofs, underground rainwater storage systems, rain gardens and rain barrels . Incorporate on site storm water management features into the development as required by the Surrey Stormwater Drainage Regulation and Charges Bylaw, as amended.	A rain garden will be installed.
22	Drainage: Construct wetlands and detention ponds to improve the quality of rainwater through bio filtration and to maximize habitat creation.	A rain garden will be installed.

23	<p>ALL registered professionals who will be involved in the development proposal, whether a Biologist, Geoscientist, Engineer, Forester, and/or Agrologist, shall have demonstrated education, expertise, accreditation and knowledge relevant to sensitive environments, ecosystems and/or streamside management.</p>	<p>Angela Dorion, Project Biologist and Wetlands Ecologist from Madrone Environmental Services is registered and familiar with sensitive eco systems.</p>
24	<p>ALL Arborists who will be involved in the development proposal shall be registered and certified with the International Society of Arboriculture (ISA).</p>	<p>N/A</p>
25	<p>Supply a list and written statement, including all documentation, verifying the qualifications of all Qualified Environmental Professionals (QEP) and/or ISA Certified Arborists responsible for preparing report submissions or involved in monitoring site conditions for Sensitive Ecosystems Development Permit applications.</p>	<p>Angela Dorion , Project Biologist and Wetlands Ecologist from Madrone Environmental Services. Attached Report is stamped with her seal.</p>
26	<p>Where more than one Qualified Environmental Professional is needed, submit a written statement identifying THE PRIMARY QEP for the entire development and acknowledging their role to ensure: all required reports are prepared by qualified professionals and are coordinated both in content and execution; and that all relevant Development Permit Guidelines and requirements have been met and/or addressed in the application submission. ii) Protection Areas Use the following documents to determine the Sensitive Ecosystem Area to be protected.</p>	<p>N/A</p>
27a	<p>Zoning Bylaw: Part 7a, Streamside Protection of Surrey's Zoning Bylaw is to be used to determine the Area of Protection required for development adjacent to a stream.</p>	<p>Streamside Protection is from COSMOS</p>
27b	<p>Biodiversity Conservation Strategy: the Biodiversity Management Areas, Green Infrastructure Network and Appendix J of the Biodiversity Conservation Strategy are to be used to determine the Area of Protection required for development within a Green Infrastructure Area.</p>	<p>N/A</p>
28	<p>Maximum Safeguarding: conveyance of the Protection Area to the City of Surrey. Where conveyance is chosen, the applicant is not responsible for the additional ecological restoration or on-going maintenance of the Protection Area as detailed and described below under the Minimum Safeguarding option.</p>	<p>N/A</p>

29	<p>Minimum Safeguarding:  registration of a combined Restrictive Covenant/Right of Way against the property to ensure safeguarding and maintenance of the Protection Area in perpetuity.</p> <p>The Restrictive Covenant/Right of Way shall detail the:  1) identified “no disturbance” and “maintenance access” areas;  2) provisions for post construction on going management of the Protection Areas for a minimum of five years, including any required rehabilitation, restoration and/or conservation of any areas identified by the project managing QEP;  3) provisions for yearly monitoring and reporting; and  4) identification of the Principal QEP responsible for providing yearly monitoring reports during the minimum five year maintenance period.  5) compensation plan and cost estimate for all items listed in this section. This will also be used to determine landscape bonding and security requirements for installation and maintenance purposes.</p>	N/A
30	<p>Building and Construction: Identify all existing on site buildings, structures and developed areas, including paved and landscaped areas, and any other areas disturbed beyond its original condition.</p>	Existing buildings have been identified.
31	<p>Soils: Perform a slope analysis and identify existing topographic features including geological and hydrogeological soil conditions, particularly areas of unstable or sensitive soils</p>	Elevations are shown on the drawing. There are no unstable areas.
32	<p>Trees and Vegetation: Identify and detail existing vegetation and trees (including trees defined in the Surrey Tree Protection Bylaw, as amended) and submit in an arborist’s assessment report .</p>	Existing trees are shown.
33	<p>Risk Act or Provincial Red or Blue Listed plant or animal species and their critical habitats including shrub and ground cover communities and any species, or habitat feature, identified as requiring year round protection as identified in the Provincial Wildlife Act</p>	Barn swallows the only identified at risk species, their habitat will not be disturbed.
34	<p>Drainage: Identify the Streamside Protection Area and stream locations, including top of bank</p>	Areas including top of bank have been identified.
35	<p>Drainage:  Identify existing site drainage conditions in accordance with the Integrated Storm-water Management Plan (ISMP) relevant to the site location.</p>	No cattle or other animals on property whose fecal matter could raise levels in LCR watershed in accordance with the ISMP Little Campbell River section 14.4
36	<p>Drainage:  Detail existing site drainage conditions including depth to ground water table, storm water conveyance, infiltration and storage features and storm water channels and overland flow paths.</p>	Existing surface flow identified on drawing

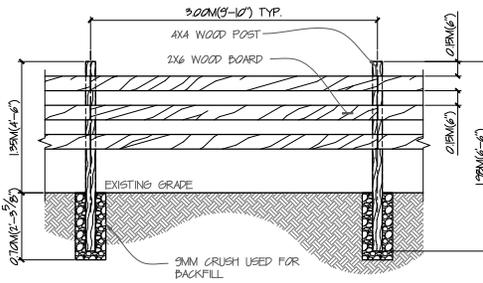
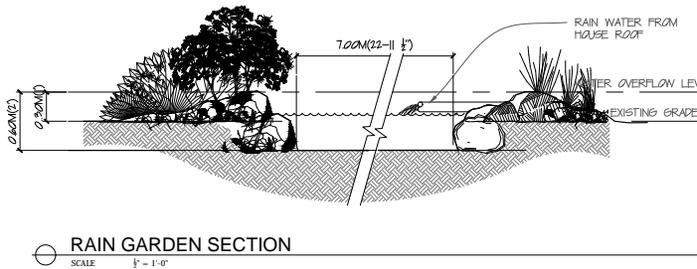
37a	Overall Site: Identify the Streamside Protection Area and where it is situated with the development.	SPA has been identified
37b	Overall Site: Identify the Green Infrastructure Protection Area and where it is situated with the development.	GIA has been identified
38	Overall Site: Locate development where it is most sensitive to the objectives of the Biodiversity Management Areas, Green Infrastructure Network and corresponding conditions and recommendations required for management as identified in Surrey's Biodiversity Conservation Strategy	House is far from GIA
39	Building and Construction: Detail construction specifications including materials, timing, technologies and techniques proposed as a means to mitigate and reduce the ecological impacts of development on the identified Stream or Green Infrastructure Protection Area.	Building is primarily wood with no basement so will have minimum ecological impact.
40	Building and Construction: Explain how the proposed development conforms to Surrey's Drainage Regulation and Charges Bylaw, as amended, as well as policies in Secondary Plans, Integrated Stormwater Management Plans and the Zoning Bylaw, as amended;	All construction will be conducted at suitable distances from any area which may lead to high turbidity levels in watercourse as per Little Campbell River section 4.4 Priority Issues - Construction-phase turbidity from Development.
41	Building and Construction : Detail the locations of all proposed buildings, structures and impervious surfaces.	Location of house and paved areas shown on development permit plan.
42	Building and Construction: Detail the timing and scheduling of all proposed development activities.	Construction will begin as soon as building and development permit are granted. Estimated construction time: 1 Year
43	Soils: Provide site grading plans illustrating the area and extent of proposed soil disturbance including slope grades and any proposed retaining wall heights, locations and materials used. Detail how slope or soil stability will be ensured and how erosion and increased sedimentation risks will be reduced.	Site grades are shown on development permit plan. Existing slopes will not be changed.
44	Trees and Vegetation: Identify how existing trees, shrubs and groundcover will be retained and protected including details and specifications on the replanting, restoration and management of vegetated areas and maintenance of short and long term hydraulic regime.	trees and shrubs will all be retained

45	Trees and Vegetation: Identify individual tree retention and removal, and areas of structured landscaping, including plant species, size and location.	tree size and locations are listed on the plan. There are no trees near the development.
46	Trees and Vegetation: Provide details as to how the Streamside or Green Infrastructure Area management or protection objectives will be met and monitored following the official completion of all construction activity. Where restorative work IS NOT required, maintenance and monitoring shall be for a minimum of ONE year; and where restorative work IS required, maintenance and monitoring shall be for a minimum of FIVE years.	Restorative work is not required. QEP can inspect the site one year after construction
47	Trees and Vegetation: Provide a restoration, maintenance and cost estimate plan consistent with the development requirements identified in the Ecosystem Management Plan and/or Impact Mitigation Plan to be used to determine landscape bonding and security requirements for installation, monitoring and maintenance purposes.	Fence detail and cost estimate submitted.
48	Habitat: Articulate how the proposed development meets the Objectives and Recommendations of the Biodiversity Management Areas and Green Infrastructure Network of the Biodiversity Conservation Strategy.	House is located in a hay field and will not negatively affect biodiversity.
49	Habitat: Detail how wildlife habitat will be protected and enhanced while taking into consideration wildlife movement and connectivity to adjacent sites. Focus on Schedule 1, Federally protected Species At Risk Act or Provincial Red or Blue Listed plant or animal species and their critical habitats and how they may be affected by the proposed development and indicate how proposed Best Management Practices may be used for the protection and preservation of that habitat.	A fence will be constructed as shown and the house may be a nesting site for the barn swallows where there was previously none.
50	Drainage: Identify post development drainage site conditions in accordance with the Integrated Stormwater Management Plan (ISMP) relevant to the site location.	roof rainwater will be channelled to the rain garden
51	Drainage: Detail how flooding risk and water quality degradation will be mitigated including specific measures that will be taken to prevent channel erosion and prevent the fouling of streams, wetlands or drainage conveyance corridors.	rain garden will be installed

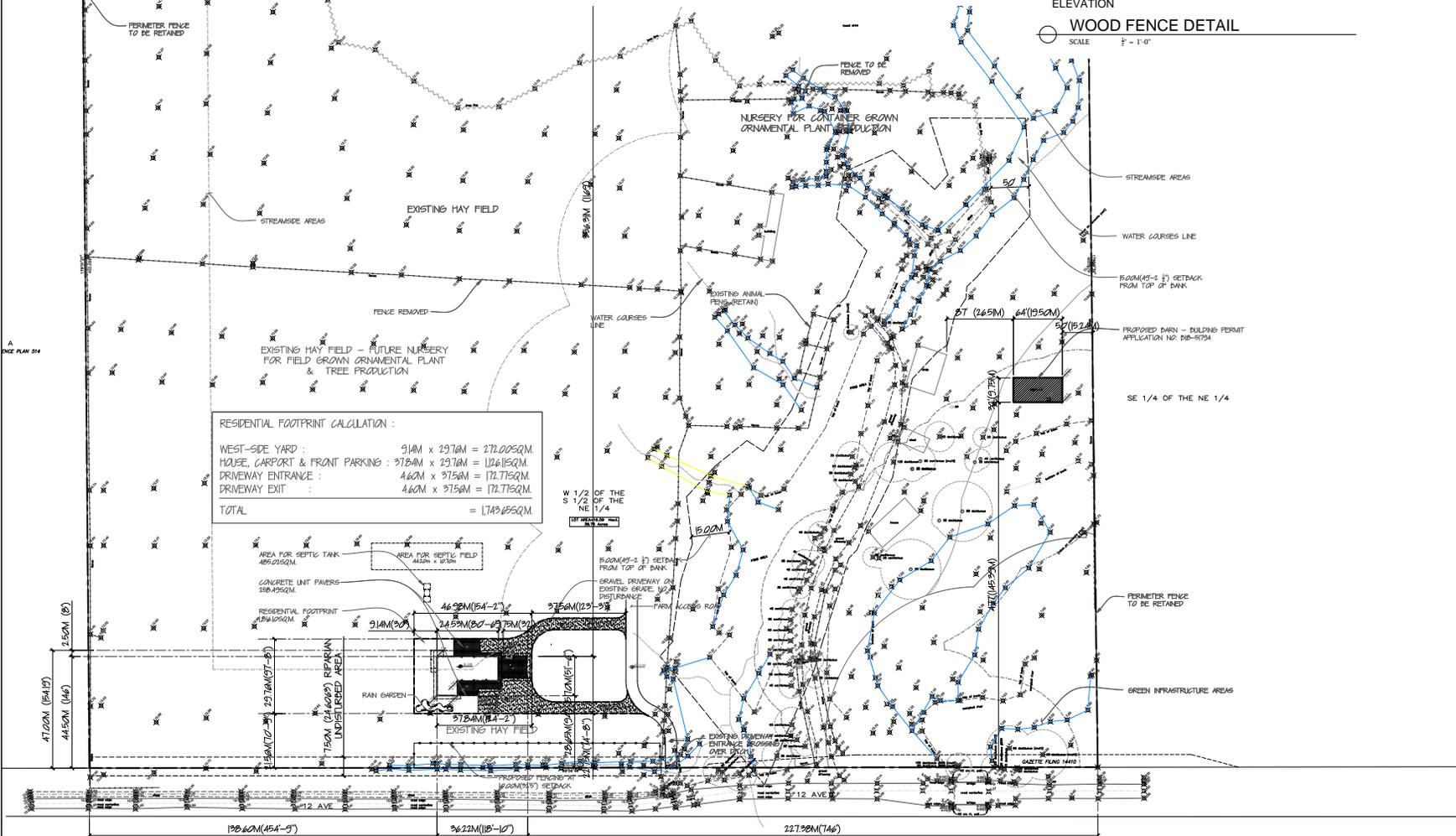
52	<p>An IMPACT MITIGATION PLAN is required to determine the appropriateness of requests to reduce the Streamside Protection Area (through the use of a Development Variance Permit) as defined in Surrey's Zoning Bylaw, Part 7a. The IMPACT MITIGATION PLAN, where relevant to the site (determined by City of Surrey), shall include the following:</p> <p>Overall Site: A detailed Riparian assessment report, following the Provincial methods specified in the Riparian Areas Regulation, B.C. Reg. 376/2004, identifying the regulatory Streamside Protection and Enhancement Area and associated measures.</p> <p>Overall Site: An assessment report indicating any expected changes and modifications to streams and aquatic and riparian areas, including any expected water quality reductions, water quantity changes, or fish and wildlife habitat degradation, with a particular focus on salmonid habitat and healthy tree retention, as a result of the proposed Streamside Setback Area variance.</p> <p>Overall Site: A restoration plan and cost estimate for the items submitted with the Impact Mitigation Plan. This restoration plan shall also be used to determine landscaping bonding and security requirements for</p>	N/A
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**APPENDIX 2**  
**Site Plan**



ELEVATION  
WOOD FENCE DETAIL  
SCALE 1/4" = 1'-0"



NO	DATE	DESCRIPTION
3	JAN 9, 2019	RESIDENTIAL FOOTPRINT REVISED
2	OCT. 2, 2018	REVISION AS PER CITY COMMENTS
1	AUG 8, 2018	ISSUED FOR DEVELOPMENT PERMIT

**STEPHEN DEE**  
18167 12 AVENUE, SURREY, BC V3Z 9R9  
ph 604 760-8506 email : stephen@dee.ca

PROJECT:  
18167 12 AVENUE, SURREY, BC  
PROPOSED RESIDENCE

DRAWING:  
ECOSYSTEM DEVELOPMENT PLAN

DRAWING NUMBER:  
DP.01

DATE:  
SCALE: 1/4" = 1'-0"  
DRAWN: ES DESIGN: ES CHECKED: SD