

# Agricultural Advisory Committee

## AGENDA



Thursday, November 12, 2020

6:00 pm

Council Chamber

City Hall, 1435 Water Street

Pages

### 1. Call to Order

THE CHAIR WILL CALL THE MEETING TO ORDER:

(a) The purpose of this Meeting is to consider certain Development Applications as noted on this meeting Agenda.

(b) The Reports to Committee concerning the subject development applications are available on the City's website at [www.kelowna.ca](http://www.kelowna.ca).

(c) All representations to the Agricultural Advisory Committee form part of the public record.

(d) As an Advisory Committee of Council, the Agricultural Advisory Committee will make a recommendation of support or non-support for each application as part of the public process. City Council will consider the application at a future date and, depending on the nature of the file, will make a decision or a recommendation to the Agricultural Land Commission.

(e) In accordance with the Order of the Provincial Health Officer on Gatherings and Events, the City is required to collect the first and last name and telephone number or email address of everyone attending a Council meeting, public hearing, or Council Committee meeting. this information will be kept by the City for 30 days in case there is a need for contact tracing on the part of the medical health officer. If the information is not required for that purpose it will be destroyed after 30 days.

We appreciate your cooperation in meeting this requirement.

### 2. Minutes

Approve Minutes of the Meeting of August 13, 2020.

3 - 6

**3. Applications for Consideration**

**3.1. Old Vernon Road 982, A19-0018 - Jeetender S. Kandola & Manraf K. Kondola**

7 - 181

To consider an application to the Agricultural Land Commission (ALC) for a Non-Farm Use (NFU) under Section 20(2) of the ALC Act, to allow i) a composting operation and ii) storage for tree service companies for a portion of the subject property.

**4. ALC Decisions - Update**

**5. Next Meeting**

December 10, 2020

**6. Termination of Meeting**





## Agricultural Advisory Committee

### Minutes

Date: Thursday, August 13, 2020  
 Time: 6:00 pm  
 Location: Council Chamber  
 City Hall, 1435 Water Street

Committee Members Present: Derek Brown (Alternate), Keith Duhaime, Avi Gill, Yvonne Herbison (Vice Chair), Domenic Rampone, Jeff Ricketts,

Committee Members Absent: John Janmatt (Chair), Aura Rose, Jill Worboys, Peter Spencer (Alternate)

Staff Present: Planner Specialist, Alex Kondor; Planner Specialist, Wesley Miles; Community Planning & Development Manager, Dean Strachan; Divisional Director, Planning & Development Services, Ryan Smith; Legislative Coordinator (Confidential), Clint McKenzie

#### 1. Call to Order

The Vice Chair called the meeting to order at 6:05 p.m.  
 Opening remarks by the Vice Chair regarding conduct of the meeting were read.

#### 2. Applications for Consideration

##### 2.1 4870 Chute Lake Road - A20-0003 - Stephen Cipes

Staff displayed a PowerPoint presentation outlining the application for a culinary college for humanity.

Staff responded to questions from the Committee.

Ed Grifone, Applicant, CTQ Consultants & Summerhill Wineries Proprietor, Stephen Cipes

- Provided history on the establishment of Summerhill Wineries.
- Provided an overview of the application.
- Highlighted the objectives of the culinary institution.
- Highlighted the use of existing infrastructure.
- Confirmed the number of acres dedicated to vegetable and food production and the mandate to buy from local farmers.
- Confirmed there will be approximately 34,000 square foot of garden production on the building itself.

Stephen Cipes, Proprietor

- Provided the background to the establishment of Summerhill Wineries.

Esra Cipes Chief Financial Officer:

-Read a letter of support from the Hollyhock Lifelong Learning Centre in Cortes, BC.

Head Chef, Culinary Arts Instructor, Upper Canyon Drive North

- Discussed curriculum being on a working farm culinary experience.
- Outlined the 8-week culinary course with Westbank First Nation taking place in the Fall 2020.
- Outlined the culinary school curriculum being developed with Focus College that will be Provincially accredited.
- Responded to questions from the Committee.
- Responded to questions regarding parking stalls being mainly accommodated on the existing structure. Confirmed no agricultural land will be used for parking.

Matt Cameron June Springs Road - Managing Partner of CTQ Consultants Kelowna

- Outlined sewer and water requirements.

Moved by Domenic Rampone/Seconded by Derek Brown

THAT the AAC recommend support to Council for the non-farm use of the subject property.

Carried  
Opposed – Yvonne Herbison, Jeff Ricketts

Anedotal Comments:

- Concern regarding the size of the property – consider a smaller size facility.
- A reduction in size of the development needs to be considered.
- Concerns regarding the impact on neighbouring agricultural properties.
- Full support for the educational component.
- Concern regarding the accommodations being used for tourism versus teaching.
- Concern regarding how much the primary food production will be emphasized. Production of fruit and vegetables needs to be as important as the culinary focus of the institute.
- Concern regarding wineries being given more ability to have non-agricultural use - concerned a facility like this could set a precedent.
- Request Council continue to make compliance and enforcement for noncompliance a priority for these facilities.

**2.2 4213 Gordon Drive - A20-0006 - Dorothy Thomson**

Committee member Jeff Ricketts declared a conflict of interest as he leases farmland from the applicant.

Staff:

- Presented a PowerPoint presentation outlining the application.
- Discussed land dedication and park transfer to the Central Okanagan land Trust for a family memorial.
- Responded to questions from Committee

Dorothy Thomson, Gordon Drive - Applicant

- Has lived in the old house for 38 years.
- Confirmed the house is on city water and sewer.
- Responded to questions from the Committee.

Staff responded to questions from Committee.

Moved By Keith Duhaime/Seconded By Domenic Rampone

THAT the AAC recommend to Council that the application to subdivided land within the ALR be supported.

**Carried**

Committee Member Jeff Ricketts returned to the meeting.

**2.3 4690 Hwy 97 N - A20-0008 - City of Kelowna**

Staff displayed a PowerPoint presentation outlining the application.

Graham Hood, Strategic Land Development Manager City of Kelowna

- Provided a PowerPoint presentation outlining the application.
- Staff responded to questions from the Committee.
- Provided the history and policy context to the application.

Jerry Dombowsky, Transit and Programs Manager

- Outlined the transit operations maintenance facility o the present yard on Hardy street that maintains 120- vehicles.
- Provided an overview of the community benefits of transit.
- Discussed the site search to date since 2013.
- Outlined the Investing in Canada Infrastructure Program grant that would be accessed through the federal government for the project.
- Reviewed the site suitability analysis.

Melanie Piewetski, professional Agrologist - Associated Environmental Consultants

- Spoke to the agricultural assessment.
- Reviewed the mitigation strategy.

Johannes Saufferer

- Spoke to the site specific and community agricultural highlights of the subject property.
- Discussed innovative proposals
- Spoke to the facility development and the buffering and interface mitigation commitment.

Staff responded to questions from the Committee.

Moved By Domenic Rampone/Seconded By Keith Duhaime

THAT the Exclusion of the subject property under Section 29(1) of the Agricultural land Commission Act not be supported.

**Carried**

Anedotal comments

Concern that a more exhaustive search for a site needed to take place.

Concern that the agricultural assessment of the property is underestimated.

Staff responded to questions from Committee

Staff commented the community benefit of the proposal.

**3. Minutes**

Moved By Domenic Rampone/Seconded By Keith Duhaime

THAT the Minutes of the July 9, 2020 Agricultural Advisory Committee meeting be adopted.

**Carried**

**4. New Business**

Moved By Domenic Rampone/Seconded By Jeff Ricketts

THAT City Council be requested to consider Christine Forbes, the Regional Agrologist from the Ministry of Agriculture as a non-voting member of the Agricultural Advisory Committee.

**Carried**

**5. Termination of Meeting**

The Chair declared the meeting terminated at 9:19 p.m.

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Chair

DRAFT



2. Tree Service / Landscaping Company – Vehicle and Equipment Storage
3. Composting Operation

The AAC recommended that Council support the proposal. The Committee also acknowledged that the owners had been working to remediate the property and therefore recommended a 3-year Temporary Use Permit (TUP) with an extension if continued progress was demonstrated. The Committee expected NFU activities to cease when the remediation was completed and recommended visual screening for the purpose of respecting the neighbourhood. The Committee did not want the support of this application to set a precedence for other farmers and support was only being considered due to the history of this particular property and the clear goal of remediation on this property.

The NFU application was brought before Council in October of 2017 and was defeated. Council did not approve the proposed boat and RV storage on the property, however composting operations including vehicle and equipment storage directly related to composting operations was considered acceptable.

Bylaw enforcement was initiated and by the fall of 2018 all outdoor storage of C-cans, boats and RVs were removed from the subject property. Additionally, throughout 2018 the property owner worked with the City along with the landscaping companies operating from the property to remove all non-essential vehicles, materials, supplies and equipment that did not benefit the composting operations off the subject property. By spring of 2019 the operational footprint of the tree service company was reduced, and non-essential equipment and materials were removed from the property.

A new application for an NFU in the ALR (Attachment A) was submitted for the subject property in May of 2019 (application file number A19-0018). Details of this application are outlined in the following sections.

### **3.0 Proposal**

The applicants are requesting approval from the ALC for the following NFU on the subject property:

1. Composting operations
2. Tree and landscaping services company - vehicle and equipment storage

The proposed uses are not permitted under the current A1 – Agriculture 1 zone, however the main purpose for the NFU request is to continue work towards reclaiming the land for agricultural use. The proposal is part of a long-term plan to reduce and eliminate the existing wood waste on the property which currently prohibits the use of the site for agriculture, and ultimately to rehabilitate the parcel for a permitted non-soil-based agriculture use, such as green houses, nursery or animal farming.

Should the proposed NFU use be permitted, under the conditions and requirements of a TUP, a time period could be established to provide an opportunity for the applicants to undertake the NFU. A TUP would limit the time permitted for a maximum of three years with a possible three-year extension, for a total of six years, with annual reports submitted by the applicant outlining the progress made on the subject property. This approach would help finance equipment needed to assist the wood composting operations through an effort to reduce the wood waste volume on the property, and ultimately reclaim the parcel to a condition where agriculture can be undertaken. Should the proposal be approved by the ALC, and further should Council approve a TUP, the use would then be consistent with Official Community Plan (OCP) policy.

### **3.1 Project Description**

Approximately the northern two-thirds of the subject property contain wood waste piles of varying size and volume, primarily deposited from the mid 1980's to the early 2000's from a previous Sawmill and wood recycling facility. Over the course of time, the wood lost much of its carbon value, such that the BTU potential has been reduced. Similarly, the nitrogen values have also degraded from the time of deposition.

Therefore, the value for cogeneration has been significantly reduced and the wood waste does not hold value as a compost additive without significantly augmenting the wood waste by introducing organics and other supplemental materials.

Since acquiring the property in 2005, the current property owners have been working diligently by removing and recycling the wood waste as compost material as they work towards rehabilitation of the parcel. In general, the applicants' long-term plan towards reclaiming the land to a viable agriculture consist of sorting, grinding and screening the wood waste, and then introducing fresh wood chips and yard waste material (the latter adds carbon back into the composting process) in order to produce compost material.

Currently there are two companies associated with composting operations which are located on the subject property; TNT Trucking Ltd. (TNT) and A1 Tree Services (A1). A1 provides fresh wood chips brought in from off-site between the spring and fall seasons, and works with TNT to process the materials. A1 also store vehicles and equipment year-round on the property which are related to composting operations.

With six-person on-site staff, TNT oversees the main composting operations at the property. Since TNT started the composting work in 2017, it is estimated that 3,000 m<sup>3</sup> to 4,500 m<sup>3</sup> (4,000 yard<sup>3</sup> to 6,000 yard<sup>3</sup>, or approximately 5%) of wood waste has been removed off the property. During composting activities, it was identified that the wood waste piles are mixed with variety of other waste material left from the time of the Sawmill operations. Waste materials include metals, plastics, and rock aggregates of various size, all of which require additional handling, sorting, screening and sieving. A crusher was purchased and brought onto the property to crush the aggregate material, which in part is used to mix with and create the compost material.

As part of this NFU application, the applicant and TNT provided supplemental documents that outline the on-site operations which help build the framework around the proposed rehabilitation plan. These documents and their objectives are described below:

*1. Site Plan and Non-Farm Use Operations Rationale*

The applicant submitted a detailed site plan and a rationale outlining the existing and proposed NFU operations (Attachment B). In general, the site consists of the following locations and operations:

- an existing single-family dwelling and driveway to the south;
- storage area for equipment and vehicles for A1, located along the southeast property boundary (NFU);
- interior driveways, compost operations and staging areas and storage area for equipment and vehicles for TNT, located within the central part of the property (NFU);
- future proposed driveways required to access the wood waste piles along the centre and north end of the property (NFU).

A list of the on-site equipment and structures as well as a detailed operation rationale for compost production at the site is outlined in Attachment B.

*2. Guidelines for Remediation of 982 Old Vernon Rd ('Guideline')*

The applicant submitted a proposed guideline that outlines the current on-site operations and equipment rationale (Attachment C). The following is a summary of TNT's current on-site activities, making up the framework for on-going and future composting plan to eliminate the wood waste:

- excavation, grinding, screening and sieving of wood waste piles;
- aggregate recycling (crushing) of waste rock found within the wood waste piles;

- provide fresh wood and landscaping cuttings brought in from off-site used to blend with wood waste;
- production and distribution of compost material;
- on-site vehicle and equipment storage that are related to composting operations.

In addition to fire and dust suppression and noise mitigation plans, the Guideline also outlines a proposed 5-year plan to reduce and ultimately eliminate the wood waste piles from the property through compost production. The compost production projection is based on "a maximum mix ratio of approximately 25% wood waste <sup>1</sup>". At current level of compost productions, "TNT estimates the need for roughly 7,500 yards<sup>3</sup> (5,734 m<sup>3</sup>) of earth material (soils, sands, clay and rock mix), with compost and woodchips at pre-shred volume of 7,500 yards<sup>3</sup> annually in order to produce a goal of 5,000 yards<sup>3</sup> (3,827 m<sup>3</sup>) of wood waste reduced annually <sup>2</sup>" over 5-years.

### 3. Topographic Survey

A survey company was engaged to produce a topographic survey of the existing wood waste piles (Attachment D). This survey establishes a current baseline of the approximate total volume of Sawmill waste that is on the subject property. An estimated 11,114 m<sup>3</sup> (14,536 yard<sup>3</sup>) of Sawmill waste currently remain on the property. When compared to the compost production projections provided by the applicant in aforementioned section, the topographic survey appears to support the viability of the proposed 5-year plan to reduce and eliminate the wood waste from the property.

#### 3.2 Site Context

The subject property is located in the Rutland Sector of the City, is within the Agricultural Land Reserve and lies within the Resource Protection Area for land use according to the Official Community Plan (OCP). The properties to the west, south and east are also within the Resource Protection Area Future Land Use. The properties to the north are outside Kelowna, within the Regional District of the Central Okanagan. The property is zoned A1 – Agriculture 1 and is outside of the Permanent Growth Boundary. There is currently a single-family dwelling located near the southern property boundary.

Staff notes that 982 Old Vernon Road is within the Intensive Agriculture Area according to the City of Kelowna Zoning Bylaw No. 8000. Therefore, intensive agriculture such as poultry, mushrooms, and other intensive livestock operations would be permitted in this location under the bylaw.

The property slopes gently from the southeast corner to the northwest, with less than 2.5% grade change, from 416 metres above sea level (masl) at the northwest corner up to 426 masl at the southeast corner.

Parcel Summary – 982 Old Vernon Road:

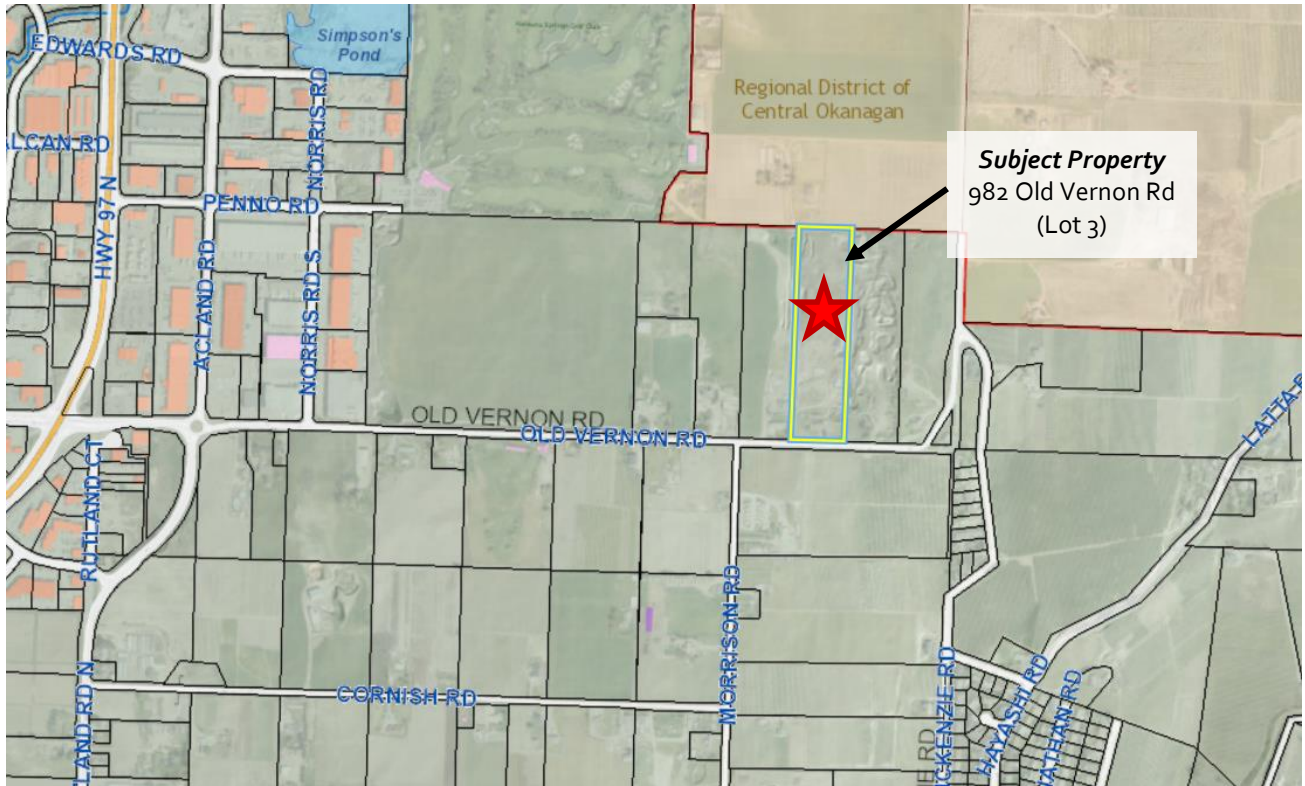
Parcel Size:	4.04 ha (10 acres)
Elevation:	414 to 423 metres above sea level (masl) (approx.)

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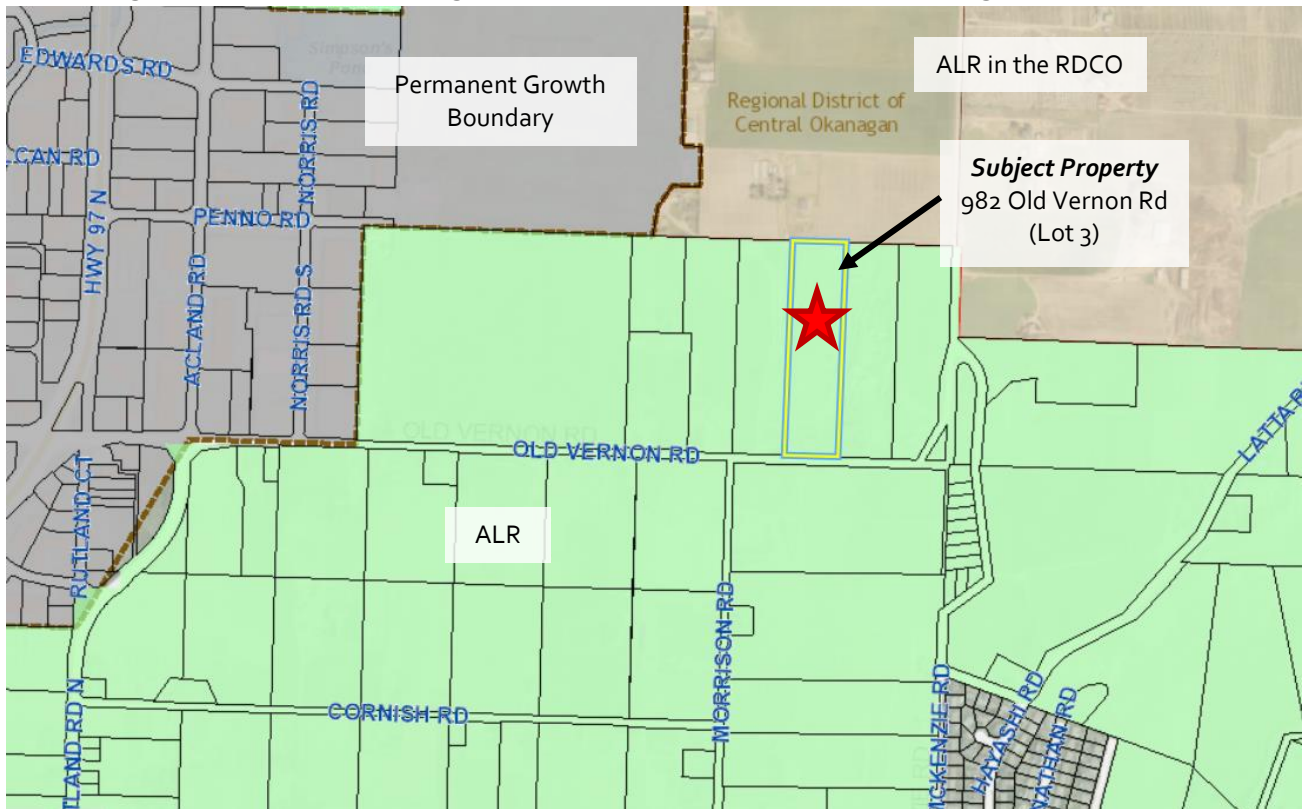
<sup>1,2</sup> TNT, Guidelines for Remediation of 982 Old Vernon Rd (2020) - Estimated Projections section



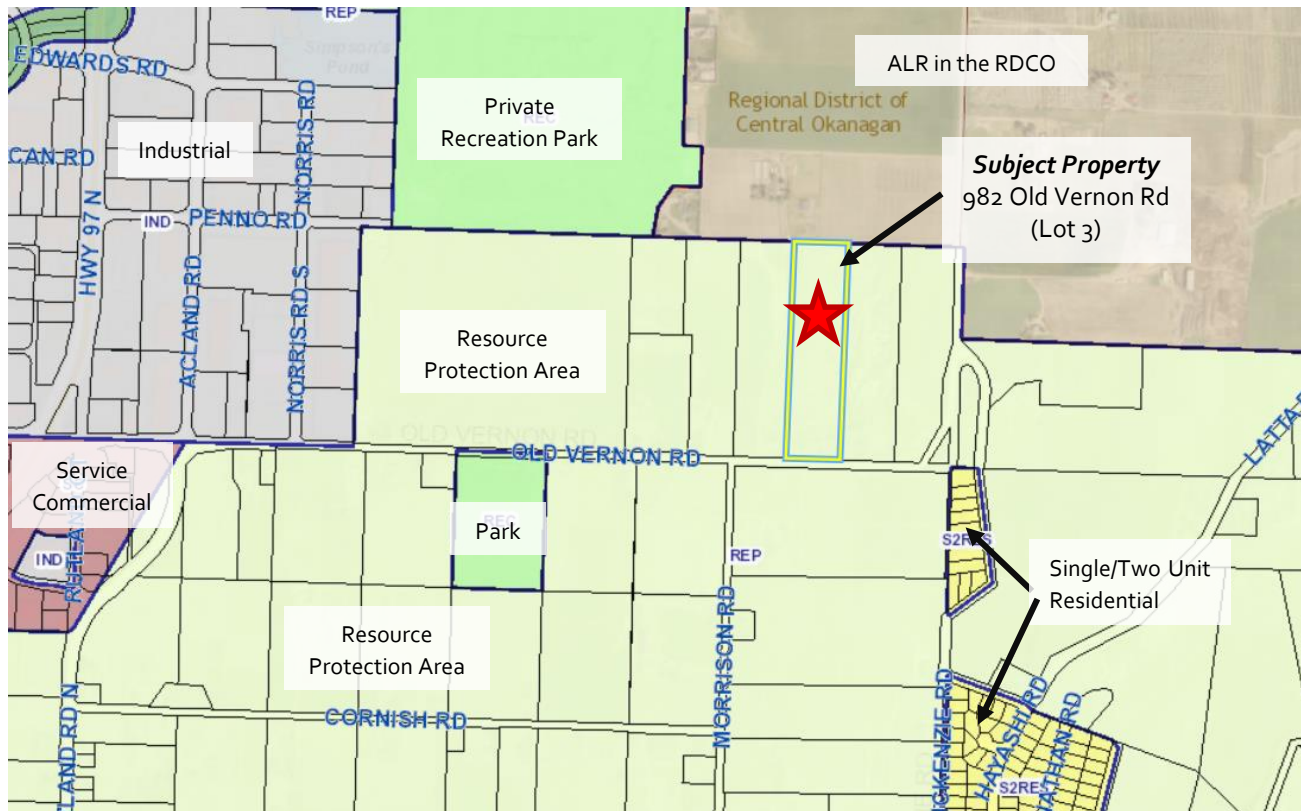
Map 1 – Neighbourhood Context



Map 2 – Agricultural Land Reserve (green) and Permanent Growth Boundary (grey)



### Map 3 – Future Land Use



### Agricultural Capability Assessment

A land capability assessment report that was conducted in 2013<sup>3</sup>, indicated that 91% of 982 Old Vernon Road has an agricultural capability rating of Class 5, improvable to Class 3. Class 1 to 3 are considered prime agricultural land and relatively rare in the Okanagan. The required improvements include ditching and/or artificial drainage in the spring, and irrigation in the summer months.

An estimated cost and associated requirements to rehabilitate and improve the soil to a point where it could support soil-based agriculture was broken down as follows:

- \$150,000 – Wood waste grinding of oversized materials
- \$711,698 – Import and spread clean topsoil (approx. 27,375 m<sup>3</sup>)
- \$178,941 – Trucking of soil

The total estimated cost to improve the soil at the subject parcel in order to support soil-based agriculture at the site was estimated to be \$1,040,639. The report cites that the soil rehabilitation costs prohibit soil-based agriculture.

For Intensive Non-Soil Bound Livestock, the report states:

*For access reasons and potential conflict with neighbouring property owners this site is not suitable for non-soil bound livestock. However, it would not be feasible to rehabilitate this area for non-soil bound livestock due to the prohibitive costs of such improvements.*

<sup>3</sup> Valhalla Environmental Consulting, Jan. 2013. Land Capability Assessment 982 Old Vernon Road, (Lot 3) Kelowna, BC

For Intensive Non-Soil Bound Horticulture, the report states:

*The site is largely level. After remediation this property could be made suitable for Non-soil bound horticultural agriculture operation. However, it would not be feasible to rehabilitate this area for non-soil bound horticulture due to the prohibitive costs of such improvements.*

Staff notes that 982 Old Vernon Road is within the Intensive Agriculture Area according to the City of Kelowna Zoning Bylaw No. 8000. Staff agrees with the ALC resolution of 2014 (#92/2014) for the property that there remains potential for non-soil-based agriculture. Therefore, intensive agriculture such as poultry, mushrooms, and other intensive livestock operations would be permitted in this location under the bylaw. In addition, other non-soil-based agriculture is possible, including greenhouses.

#### 4.0 Application Chronology

Date of Application Received:	May 17, 2019
Date of Supporting Documents Received:	June 10, 2020
Date of Revised Application Received:	June 22, 2020
Date Public Consultation Completed:	None required for Non-Farm Use Applications

<b>Report prepared by:</b>	Barbara B. Crawford, Planner II
<b>Reviewed by:</b>	Alex Kondor, Planner Specialist
<b>Approved for Inclusion:</b>	Dean Strachan, Community Planning & Development Manager

#### Attachments:

- Schedule A – Development Planning Department Policies
- Schedule B – Technical Comments
- Appendix A – Site History and Aerial Photograph Chronology
- Attachment A - Applicants' ALC Act Application for Non-Farm Use (June 2020)
- Attachment B – Site Plan and Non-Farm Use Operations
- Attachment C – TNT, Guidelines for Remediation and Phasing Plan of 982 Old Vernon Rd (June 2020)
- Attachment D – BC Surveyors, Topographic Survey (June 2020)
- Attachment E – Valhalla Environmental Consulting Inc., 982 Old Vernon Rd (2013)
- Attachment F – Development Engineering Memorandum, dated November 26, 2019
- Attachment G – Ministry of Agriculture Letter, dated November 25, 2019

# SCHEDULE A – Development Planning Policies



**Subject:** 982 Old Vernon Rd  
Application to the ALC for a Non-Farm Use on a property in the ALR

## 5.0 City of Kelowna Agriculture Plan (1998)

### ALR Application Criteria<sup>4</sup>

Exclusion, subdivision, or NFU of ALR lands will generally not be supported. General non-support for ALR applications is in the interest of protecting farmland through retention of larger parcels, protection of the land base from impacts of urban encroachment, reducing land speculation and the cost of entering the farm business, and encouraging increased farm capitalization.

### 5.1 City of Kelowna Strategic Plan

**Objective<sup>5</sup>:** Sensitively integrate new development with heritage resources and existing urban, agricultural and rural areas.

Action towards this objective<sup>6</sup>: Evaluate the effectiveness of City policies and bylaws in preserving agricultural lands.

### 5.2 Kelowna Official Community Plan (OCP)

#### Land Use Designation Definitions

##### *Resource Protection Area<sup>7</sup>*

Generally, land areas within this designation (whether they are within the permanent growth boundary or not) will not be supported for exclusion from the ALR or for more intensive development than that allowed under current zoning regulations, except in specific circumstances where the City of Kelowna will allow exceptions to satisfy civic objectives for the provision of park/recreation uses.

##### *Permanent Growth Boundary<sup>8</sup>*

Lands within the permanent growth boundary may be considered for urban uses within the 20-year planning horizon ending 2030. Lands outside the permanent growth boundary will not be supported for urban uses.

## Chapter 5 – Development Process

**Objective 5.3** Focus development to designated growth areas.

**Policy .1 Permanent Growth Boundary<sup>9</sup>.** Establish a Permanent Growth Boundary as identified on Map 4.1 and Map 5.2. Support development of property outside the Permanent Growth Boundary for more

<sup>4</sup> City of Kelowna Agriculture Plan. 1998. P. 130.

<sup>5</sup> City of Kelowna Strategic Plan. 2004. P. 7.

<sup>6</sup> City of Kelowna Strategic Plan. 2004. P. 29.

<sup>7</sup> City of Kelowna 2030 Official Community Plan. Future Land Use Chapter. P. 4.2.

<sup>8</sup> City of Kelowna 2030 Official Community Plan. Future Land Use Chapter. P. 4.6.

intensive uses **only** to the extent permitted as per the OCP Future Land Use designations in place as of initial adoption of OCP Bylaw 10500, except as per Council's specific amendment of this policy. Resource Protection Area designated properties not in the ALR and outside the Permanent Growth Boundary will not be supported for subdivision below parcel sizes of 4.0 ha (10 acres). The Permanent Growth Boundary may be reviewed as part of the next major OCP update.

### **Agricultural Land Use Policies**

#### **Objective 5.33 Protect and enhance local agriculture<sup>10</sup>.**

**Policy .1 Protect Agricultural Land.** Retain the agricultural land base by supporting the ALR and by protecting agricultural lands from development, except as otherwise noted in the City of Kelowna Agricultural Plan. Ensure that the primary use of agricultural land is agriculture, regardless of parcel size.

**Policy .2 ALR Exclusions.** The City of Kelowna will not forward ALR exclusion applications to the ALC except in extraordinary circumstances where such exclusion is otherwise consistent with the goals, objectives and other policies of this OCP. Soil capability alone should not be used as justification for exclusion.

**Policy .3 Urban Uses.** Direct urban uses to lands within the urban portion of the Permanent Growth Boundary, in the interest of reducing development and speculative pressure on agricultural lands.

**Policy .6 Non-Farm Uses.** Support NFU application on agricultural lands only where approved by the ALC and where the proposed uses:

- are consistent with the Zoning Bylaw and OCP;
- provide significant benefits to local agriculture;
- can be accommodated using existing municipal infrastructures;
- minimize impacts on productive agricultural lands;
- will not preclude future use of the lands for agriculture;
- will not harm adjacent farm operations.

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<sup>9</sup> City of Kelowna 2030 Official Community Plan. Development Process Chapter. P. 5.2.

<sup>10</sup> City of Kelowna 2030 Official Community Plan: Agricultural Land Use Policies Chapter. P. 5.35.

# SCHEDULE B – Technical Comments



**Subject:** 982 Old Vernon Rd  
Application to the ALC for a Non-Farm Use on a property in the ALR

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## 6.0 Bylaw Services

Bylaw Services has one open file for this property regarding unsightly property/zoning issues.

## 6.1 Development Engineering Department

No concerns noted. See attached November 26, 2019 dated memorandum (Attachment F).

## 6.2 Fire Department

- No objections to the application.
- No burn permits will be issued for this property if requested due to the delivery of off-site clippings and wood as per Bylaw 10760.

## 6.3 Regional District of the Central Okanagan (RDCO)

RDCO staff provides the following response to the above-noted referral:

RDCO Planning staff are generally in support of the referral application, as the proposal intends to revitalize and reclaim the land to viable agricultural standards. It is recommended that the following should policies of the Regional Growth Strategy Bylaw No. 1336 be considered during the decision-making process:

3.2.5.6 - "Promote the use of agriculture and ALR lands for food production and ancillary agriculture processing and retailing consistent with uses outlined in the Agricultural Land Commission Act and Regulation".

3.2.5.7 - "Protect the supply of agricultural land and promote agricultural viability".

## 6.4 Ministry of Agriculture

See attached letter (Attachment G).

### Appendix A: Site History and Aerial Photograph Chronology

**Table 1:** History of the Sawmill and the subject property located at 982 Old Vernon Road (Lot 3).

Date / Aerial photo reference	Historical Comment
Circa 1972 / Photo #2	<ul style="list-style-type: none"> <li>➤ At the creation of the ALR, and prior to amalgamation of the site into the City of Kelowna, the Sawmill footprint was approximately 1.0 ha (2.47 acres).</li> </ul>
Circa 1976 / Photo #3	<ul style="list-style-type: none"> <li>➤ The Sawmill operation focused on the subject property. This was shortly after the establishment of the ALR.</li> </ul>
Circa 1984 / Photo #4	<ul style="list-style-type: none"> <li>➤ The storage of logs and lumber had encroached onto the subject property and Lot 1.</li> </ul>
1985 / Photo #5	<ul style="list-style-type: none"> <li>➤ The Sawmill operation had expanded beyond the subject property, over 1.7 ha in area.</li> <li>➤ In response to complaints from a neighbour, the owner made an application to the ALC to expand the Sawmill operations to the subject property.</li> <li>➤ Through Resolution # 993/85, authorization was granted, for a limited area of 1.7 ha, specifically for storage of logs, lumber and sawdust. Based on a complaint by the neighbouring Lot 4, this Resolution was subject to not placing gravel on the subject property, which was deemed to stunt the growth of fruit trees and alfalfa on Lot 4.</li> </ul>
June 4, 1998	<ul style="list-style-type: none"> <li>➤ Due to neighbours complaints, the ALC conducted a site visit that revealed impacts on Lots 1, 2, 3 and 4, including a series of ditches and ponds to capture leachate from the operation. At the time, the ALC provided a letter in response to the expanded activities: <i>'the non-farm uses have expanded and diversified without the necessary ALC approvals.... From the Commission's perspective, the only authorized activity is the Sawmill activity as it existed six (6) months before December 21, 1972 as amended by Resolution #993/85'</i><sup>1</sup>.</li> <li>➤ A subsequent site visit identified the owner had undertaken unauthorized non-farm uses (NFU) including storage and processing of waste material and pallet recycling on Lots 1 and 3. In June of 1999, the ALC issued an order to restore uses in accordance with 1985 Resolution, included restoring agriculture to all of Lot 1, and half of the subject property (Figure 1).</li> </ul>
2000 / Photos 6 & 7	<ul style="list-style-type: none"> <li>➤ The focus on the Sawmill dropped, and the site had become a construction material waste operation. In addition, it had expanded beyond Lot 2 and the 1.7 ha of Lot 3 permitted in 1985, to Lot 1 to the east and part of Lot 4 to the west. A series of complaints had been lodged to the ALC. Upon review, concerns of the ALC included:<sup>2</sup> <ul style="list-style-type: none"> <li>i. Activities were inconsistent with the ALC and Soil Conservation Act;</li> <li>ii. Demolition debris (e.g. drywall) did not make acceptable compost for a turf operation in the ALR;</li> <li>iii. Demolition debris could contain chemicals from glues and preservatives.</li> </ul> </li> <li>➤ Subsequently an application was made to the ALC in 2000 (Appendix A, air photos 6 &amp; 7) to use all of Lots 2 and 3 as a Sawmill, wood waste and pallet compost operation, with the conditions that the impacted area of Lot 1 was returned to agriculture, and that the compost was used to support a turf farm operation on Lot 4. The proposal also included selling the compost from Lot 4.</li> </ul>

<sup>1</sup> ALC, June 4, 1998. Letter to Russo's from C. Fry, Agricultural Land Commission.

<sup>2</sup> ALC, June 6, 2000. Resolution #437/2000.



Date / Aerial photo reference	Historical Comment
June 2000	<ul style="list-style-type: none"> <li>➤ Through Resolution #437/2000, the ALC granted permission to use all of Lots 2 and 3 for sawmilling, wood waste recycling/composting and pallet recycling of “clean wood” only. This approval was subject to the conditions that Lot 1 would be reclaimed to agriculture, and that a fence be erected on the east, north and west property boundaries.</li> </ul>
2005 / Photo 8	<ul style="list-style-type: none"> <li>➤ The subject property was purchased by the current owners with approximately 122,330 m<sup>3</sup> (160,000 yard<sup>3</sup>) of wood waste stockpiled at the site <sup>3</sup>.</li> </ul>
2006	<ul style="list-style-type: none"> <li>➤ A controlled burner was set up for three months to help reduce and eliminate the wood waste. The property owners spent approximately \$100,000 for this method of wood waste reduction.</li> </ul>
2007	<ul style="list-style-type: none"> <li>➤ Wood rows were established to initiate more rapid composting. This method resulted in numerous fires due to spontaneous combustion erupted with the introduction of oxygen into the lower levels. The largest one took 3 days to contain, costing the City of Kelowna \$80,000 in firefighting costs.</li> <li>➤ The property owners employed full time private water tankers and excavators to control the fires, at an approximate cost of \$50,000.</li> </ul>
2008 to 2012 / Photos 9 & 10	<ul style="list-style-type: none"> <li>➤ Property owners hired a contractor to haul wood waste to a cogeneration plant in Armstrong (Tolko) for an additional \$25,000. This effort was discontinued due to the low burning potential (BTU potential) of the old timber.</li> <li>➤ Throughout this period, the property owners worked with several landscape companies to screen, mulch and compost the wood waste, mixing it with green yard waste to create compost for market at different scales, capacity and compost production levels.</li> <li>➤ By 2012, approximately 100,000 m<sup>3</sup> (130,000 yard<sup>3</sup>) of the original 122,330 m<sup>3</sup> of wood waste had been processed and/or removed from the subject property, with an approximate 23,000 m<sup>3</sup> (30,000 yard<sup>3</sup>) remained on the property <sup>4</sup>.</li> </ul>

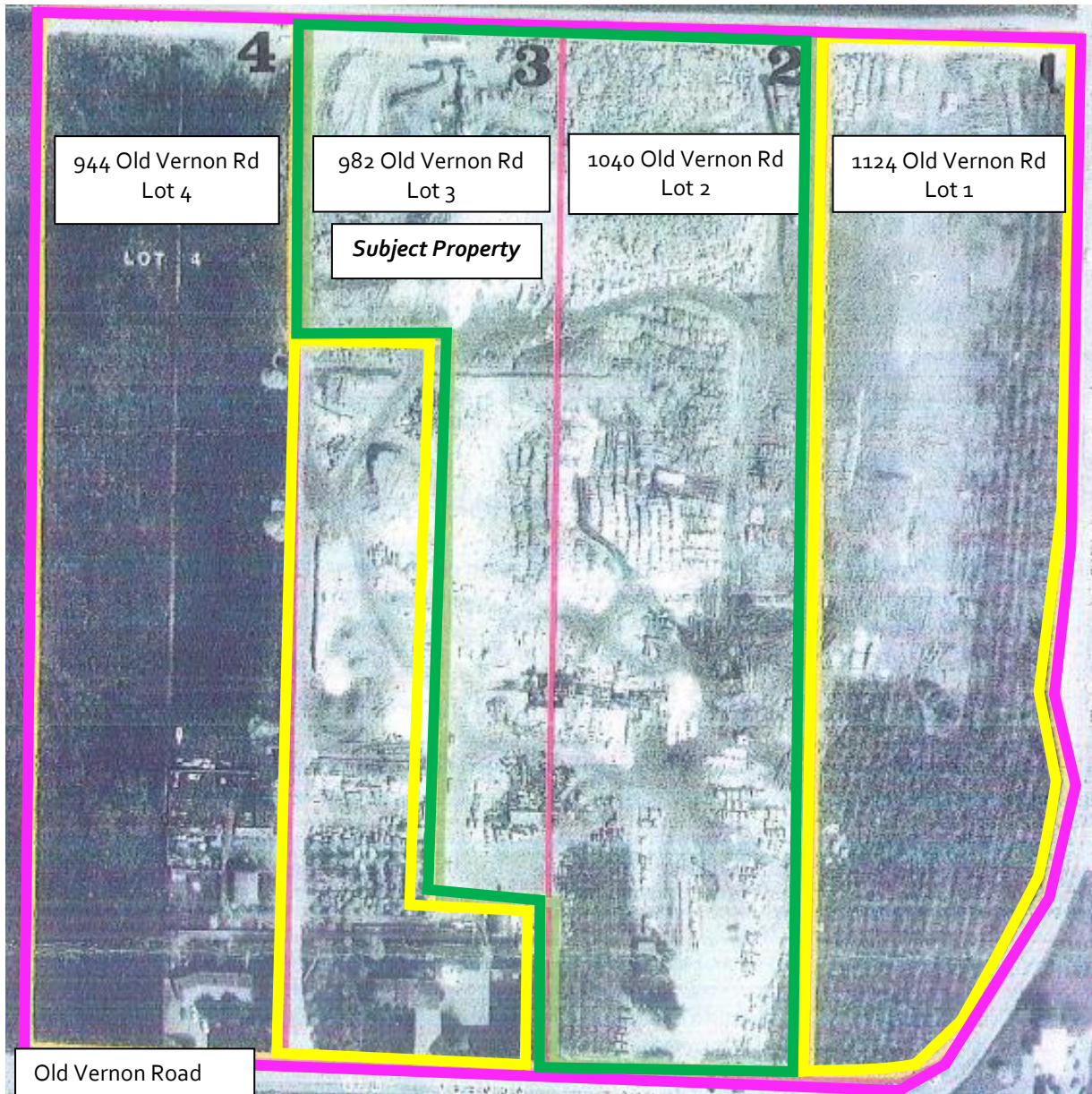
<sup>3,4</sup> Valhalla Environmental Consulting, Jan. 2013. Land Capability Assessment 982 Old Vernon Road, (Lot 3) Kelowna, BC



Date / Aerial photo reference	Historical Comment
2013 and 2014	<p>➤ An exclusion application was made to the ALC for the subject property (application file number A13-0004).</p> <ul style="list-style-type: none"> <li>▪ The Agricultural Advisory Committee (AAC) did not support the application for exclusion, however, encouraged the applicants to bring back another application if a net benefit to agriculture could be demonstrated.</li> <li>▪ The AAC was concerned that putting an industrial use into the area would result in increased traffic and pressure for urban services in an otherwise rural area.</li> <li>▪ While the AAC was unclear as to viable agriculture opportunities on the property, the Committed recommended that the applicants explore incorporating manure from a nearby feedlot and other organic materials (i.e. nitrogen sources) with the existing wood waste (i.e. carbon source) to create a compost product.</li> <li>▪ Other recommended options included a greenhouse operation or other activities that does not involve soil-based agriculture.</li> </ul> <p>➤ Through Resolution #92/2014, the exclusion application was not supported and refused by the ALC, with the following comments:</p> <p><i>'The Commission acknowledges the existing limitations of the subject property for soil-bound agriculture but believes that there are still options for reclamation of the site to an agricultural standard. Even if the property is not fully reclaimed there are other non-soil-based farm operations that would be possible on the subject property as was discussed by the local Agricultural Advisory Committee. Two possible examples for uses on the subject property are greenhouses and/or a pot nursery.</i></p> <p><u>Conclusion:</u>  <i>Despite the history of the subject property, there is still the ability for reclamation or at least improvement of the agricultural capability of the soils on the subject property. However, even without full reclamation, the property owners have other non-soil-based agricultural options available to them'<sup>5</sup>.</i></p>

<sup>5</sup> ALC, May 13, 2014. Resolution #92/2014

Figure 1 - ALC Order #368 and 369/99 (1999)



As per ALC Order #368 and 369/99 (1999):

Pink Area – Subject properties.

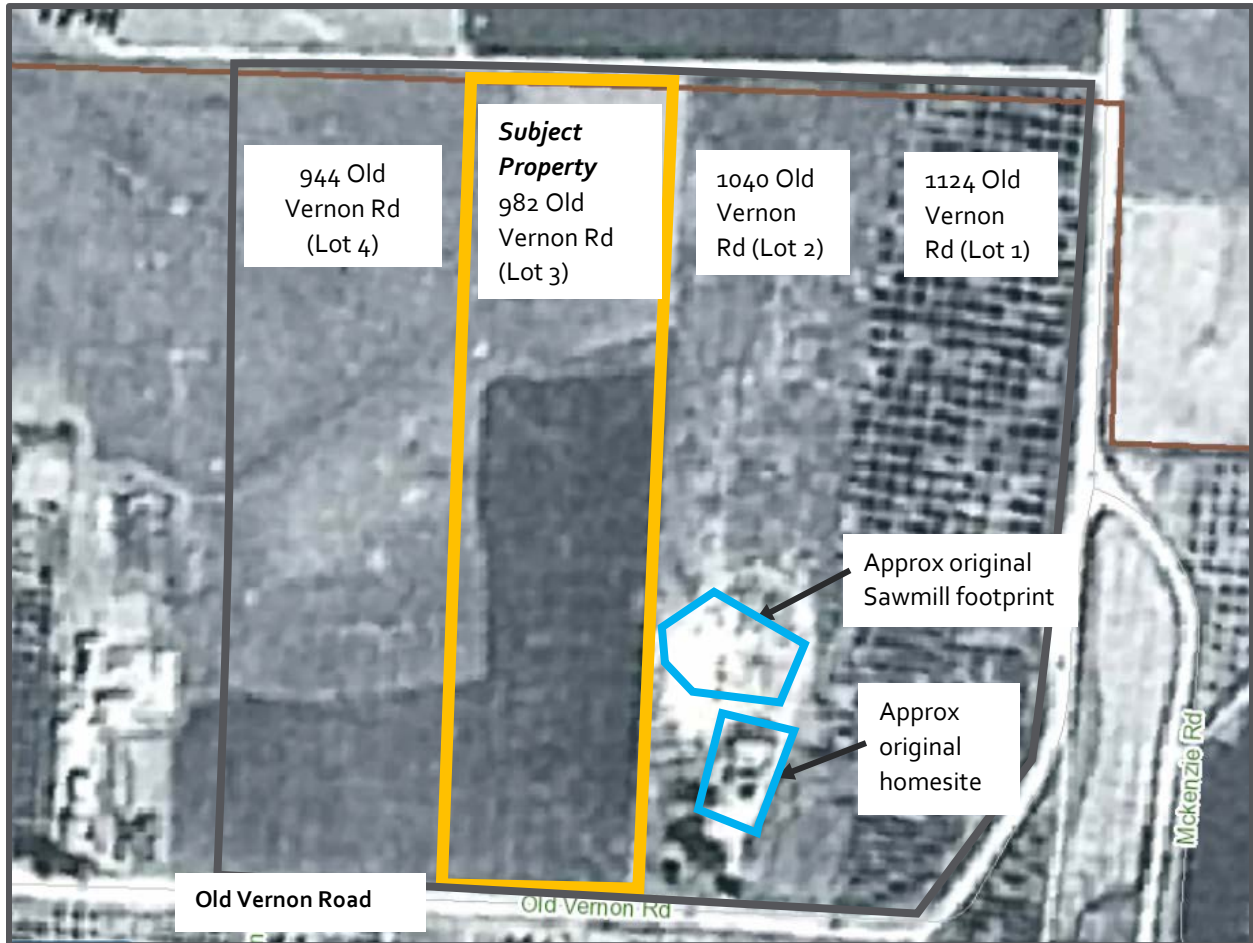
Green Area – Area Permitted to be used for Sawmill operation including the storage of logs, lumber and sawdust.

Yellow Area – Areas where no industrial activities have been permitted. All industrial activities to cease and the lands reclaimed to agricultural standards.

**Aerial Photographs**

A historical review through aerial photos of the subject property at 982 Old Vernon Road (Lot 3) and neighbouring lots at 944 Old Vernon Road (Lot 4), 1040 Old Vernon Road (Lot 2) and 1124 Old Vernon Road (Lot 1).

**Air photo 1** – Air photo circa 1959 of subject property and neighbouring lots.





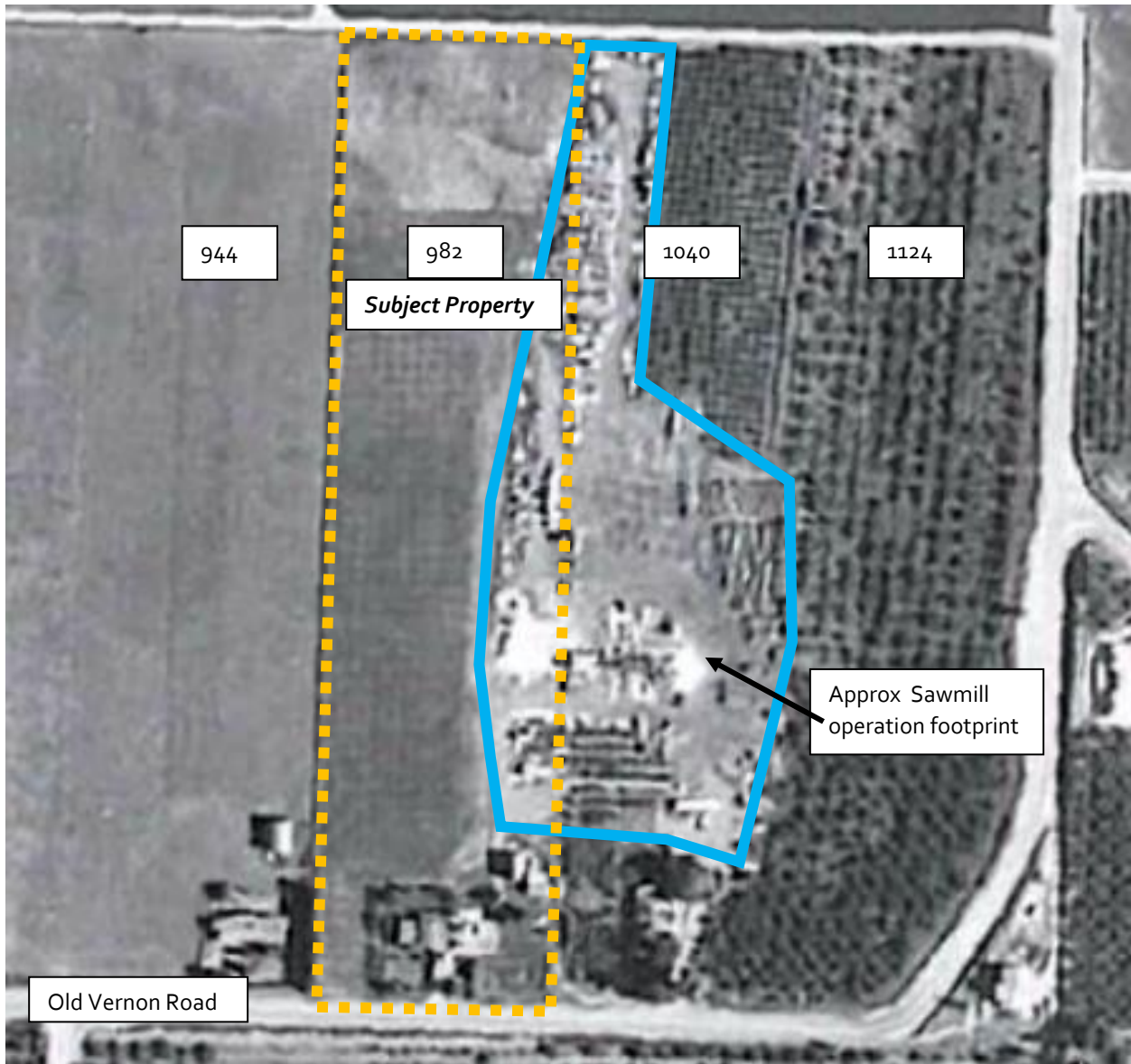
**Air Photo 2** – Air photo circa 1970 of subject property and neighbouring lots.



**Air Photo 3** – Air photo circa 1976 of subject property and neighbouring lots.



**Air Photo 4** – Air photo circa 1984 of subject property and neighbouring lots.



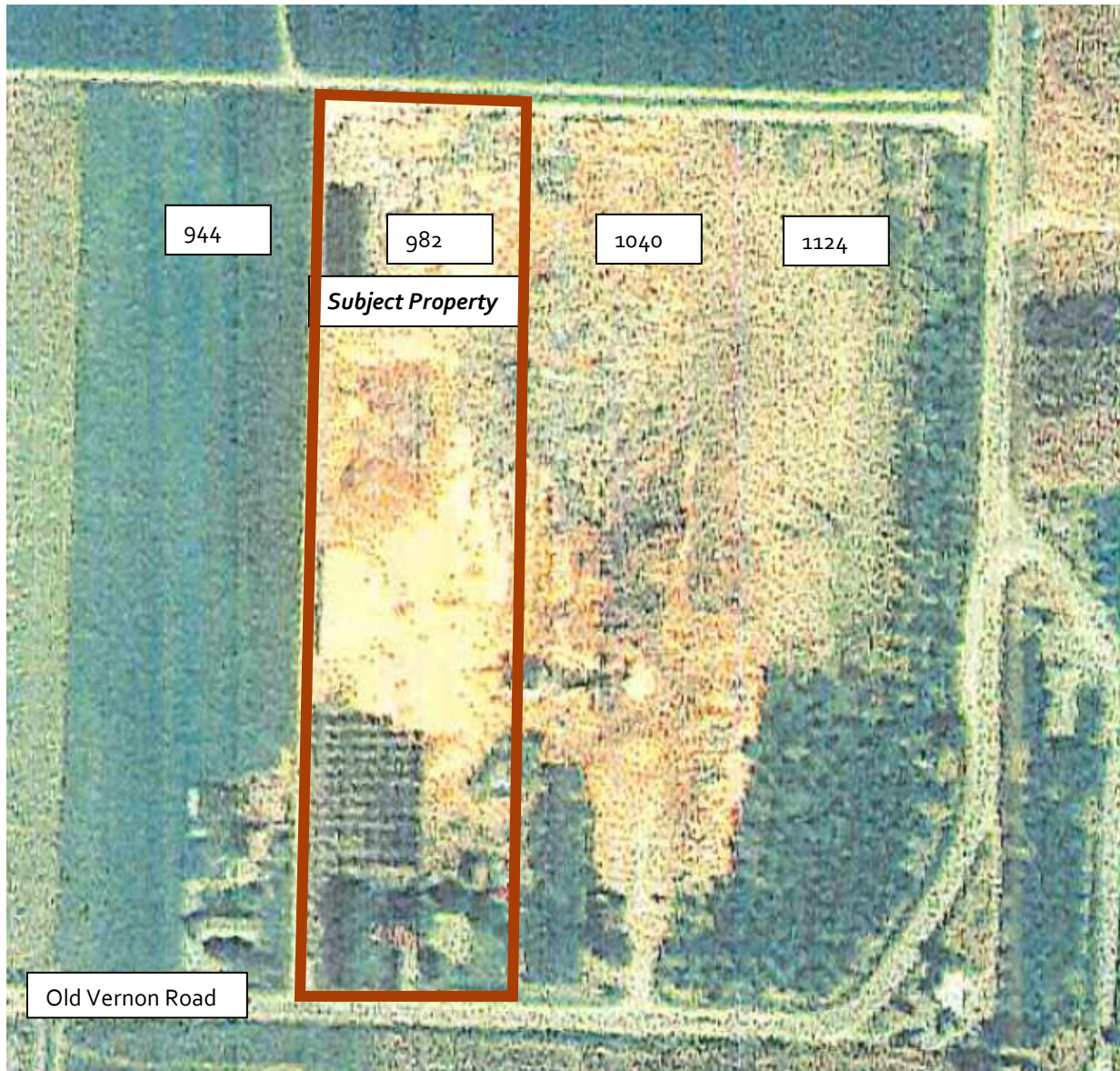


**Air Photo 5** – Air photo circa 1985 of subject property and neighbouring lots. Through ALC Resolution # 993/85, authorization was granted, for a limited area of 1.7 ha, specifically for storage of logs, lumber and sawdust.





**Air Photo 6** – Air photo circa 1999 of subject property and neighbouring lots.





**Air Photo 7** – Air photo 2000 of subject property and neighbouring lots.



**Air Photo 8** – Air photo 2006 of subject property and neighbouring lots. The subject property was purchased by current owners in 2005.





**Air Photo 9** – Air photo 2009 of subject property and neighbouring lots.



**Air Photo 10** – Air photo 2012 of subject property and neighbouring lots. Land use seen in the 2012 air photo shows 1124 Old Vernon Rd (Lot 1) reclaimed for agriculture as required by the ALC Resolution #437/2000, permitting on-farm use of the subject property and 1040 Old Vernon Rd *“for sawmilling, wood waste recycling/composting and pallet recycling”*.





**Air Photo 11** – Air photo 2017 of subject property and neighbouring lots.



**Air Photo 12** – Air photo 2019 of subject property and neighbouring lots at current use.



# Provincial Agricultural Land Commission - Applicant Submission

**Application ID:** 58053

**Application Status:** Under LG Review

**Applicant:** MANRAJ KANDOLA

**Local Government:** City of Kelowna

**Local Government Date of Receipt:** 06/22/2020

**ALC Date of Receipt:** This application has not been submitted to ALC yet.

**Proposal Type:** Non-Farm Use

**Proposal:** We are applying for a non farm use as the property was historically utilized as an industrial sawmill operation. The operations seized in 2005 and since then lots of effort has been made to reclaim land back to farm land.

The future proposal for next 6 years is to move towards reclaiming the land to a viable agriculture standard by grinding, screening and composting the remaining wood waste material and introducing fresh wood chips and yard waste adding carbon to the composting process as existing wood debris has no heat value.

Tree service on site (A1 Tree) provides fresh wood chips brought in from off site and working with the composting company processing the materials.

The tree service will work out of the property and provide us with fresh wood chips. Only the equipment required to be used in the business will be parked on the property.

Fresh product being brought on the property for composting will be approximately 15,000 yards. We will have projected volumes and will bring on material as required for the job. Maximum 2000 to 4000 maximum at any one time. We are currently moving 500 to 1000 yards per month and rest depends on the market.

We have a non permanent structure for dry storage of different amendments and sand as well. Covered area will also be utilized for repairs on equipment.

There are approximately 6 employees working.

Since the start of this remediation, equipment such as screener and grinder have been purchased to help with the remediation. We have invested lots of money to make this project a success and have this land reverted back to some form of agriculture status.

Please see the attached Site Plan Map and Detailed Information for Remediation.

**Mailing Address:**

982 OLD VERNON ROAD

KELOWNA , BC

V1X 6T8

Canada

**Primary Phone:** (250) 870-3294

**Email:** manraj kandola@hotmail.com

## Parcel Information

### Parcel(s) Under Application

1. **Ownership Type:** Fee Simple

**Parcel Identifier:** 012-206-687

**Legal Description:** Lot 3 Section 1 Township 23 ODYD (Osoyoos Div of Yale ) Plan 546

**Parcel Area:** 546 ha

**Civic Address:** 982 Old Vernon Road Kelowna BC V1X6T8  
**Date of Purchase:** 06/01/2005  
**Farm Classification:** Yes  
**Owners**

1. **Name:** MANRAJ KANDOLA  
**Address:**  
982 OLD VERNON ROAD  
KELOWNA , BC  
V1X 6T8  
Canada  
**Phone:** (250) 870-3294  
**Email:** manrajkandola@hotmail.com

<b>ATTACHMENT</b> A	
This forms part of application # A19-0018	
Planner Initials	BC
 City of <b>Kelowna</b> DEVELOPMENT PLANNING	

## Current Use of Parcels Under Application

**1. Quantify and describe in detail all agriculture that currently takes place on the parcel(s).**  
*No Agriculture Activity, as it was previously operated as an Industrial Sawmill.*

**2. Quantify and describe in detail all agricultural improvements made to the parcel(s).**  
*When sawmill operation seized in 2002, wood piles debris on site was approximately estimated at 160,000 cubic meters.  
We have diligently been removing the wood waste and now have approximately 30,000 cubic meters of wood left over.*

*Land improvements made to date in remediating the land towards agriculture standard:*

- trench burn to remove oversize debris
- grinding and trucking wood waste to Tolko Cogen Plant, unfortunately not enough heat value in the material
- screening the pile of wood debris and sold directly to market

**3. Quantify and describe all non-agricultural uses that currently take place on the parcel(s).**  
*Grinding, Screening, Composting of the wood waste.  
Bringing in clean wood chips for composting.*

## Adjacent Land Uses

### North

**Land Use Type:** Agricultural/Farm  
**Specify Activity:** Residential/Hay Field

### East

**Land Use Type:** Agricultural/Farm  
**Specify Activity:** Residential/Remnant Sawmill

### South

**Land Use Type:** Agricultural/Farm  
**Specify Activity:** Residential/Agritourist Accomodation (RV Park)



West

Land Use Type: Agricultural/Farm

Specify Activity: Residential

<b>ATTACHMENT</b>		<b>A</b>
This forms part of application # A19-0018		
Planner Initials	BC	 City of <b>Kelowna</b> DEVELOPMENT PLANNING

## Proposal

### 1. How many hectares are proposed for non-farm use?

4 ha

### 2. What is the purpose of the proposal?

*We are applying for a non farm use as the property was historically utilized as an industrial sawmill operation. The operations seized in 2005 and since then lots of effort has been made to reclaim land back to farm land.*

*The future proposal for next 6 years is to move towards reclaiming the land to a viable agriculture standard by grinding, screening and composting the remaining wood waste material and introducing fresh wood chips and yard waste adding carbon to the composting process as existing wood debris has no heat value.*

*Tree service on site (A1 Tree) provides fresh wood chips brought in from off site and working with the composting company processing the materials.*

*The tree service will work out of the property and provide us with fresh wood chips. Only the equipment required to be used in the business will be parked on the property.*

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*We have a non permanent structure for dry storage of different amendments and sand as well. Covered area will also be utilized for repairs on equipment.*

*There are approximately 6 employees working.*

*Since the start of this remediation, equipment such as screener and grinder have been purchased to help with the remediation. We have invested lots of money to make this project a success and have this land reverted back to some form of agriculture status.*

*Please see the attached Site Plan Map and Detailed Information for Remediation.*

### 3. Could this proposal be accommodated on lands outside of the ALR? Please justify why the proposal cannot be carried out on lands outside the ALR.

*This is a unique property where sawmill operations predated the ALC rules and regulations therefore was grandfathered to continue operating as a sawmill operation on ALR land. This orphaned sawmill on ALR land needs to be reclaimed back to agriculture status. Therefore the reason for asking "non-farm" use is to continue reclaiming farmland.*

### 4. Does the proposal support agriculture in the short or long term? Please explain.

*In the long run there be will benefits to agriculture use. This project isn't a small undertaking as we have already invested over a decade in trying to reclaim the land back to agriculture use. Any property heavily utilized for Industrial operation for decades is going to have it's challenges. The property wasn't monitored over the years as there are other products other than wood dumped on this property . There will definitely be lots of challenges ahead of us.*

*Our long term plan for next 6 years is to keep remediating the land and hopefully work towards utilizing this property for agriculture use for non soil based farming. (green houses, animal farming or nursery)*

### 5. Do you need to import any fill to construct or conduct the proposed Non-farm use?

No

## Applicant Attachments

- Professional Report - Agrologist Report
- Professional Report - Agrologist Report, Appendix E
- Professional Report - Agrologist Report, Appendix B
- Professional Report - Agrologist Report Addendum
- Professional Report - Agrologist Report, Appendix A
- Professional Report - Agrologist Report, Appendix C
- Professional Report - Agrologist Report, Appendix D
- Professional Report - Plan Map
- Professional Report - Survey Plan
- Other correspondence or file information - Site Map/Plan
- Other correspondence or file information - Site Map/Plan TNT
- Other correspondence or file information - Detailed Remediation Plan TNT
- Site Photo - 2018 sawmill pic1
- Site Photo - 2018 sawmill pic2
- Site Photo - 2018 sawmill pic3
- Site Photo - 2018 sawmill pic4
- Site Photo - 2018 sawmill pic5
- Site Photo - 2018 sawmill pic6
- Site Photo - 2018 sawmill pic7
- Site Photo - 2018 sawmill pic8
- Site Photo - 2018 sawmill pic9
- Site Photo - 2018 sawmill pic10
- Site Photo - 2018 sawmill pic11
- Site Photo - 2018 sawmill pic12
- Site Photo - 2008 sawmill pic1
- Site Photo - 2008 sawmill pic2
- Site Photo - 2008 sawmill pic3
- Site Photo - 2008 sawmill pic4
- Site Photo - 2008 sawmill pic5
- Proposal Sketch - 58053
- Certificate of Title - 012-206-687

## ALC Attachments

None.

## Decisions

None.

**982 Old Vernon Rd  
Sawmill Photos  
Circa 2008**

**ATTACHMENT**      **A**

This forms part of application  
# **A19-0018**

Planner Initials **BC**

City of **Kelowna**  
DEVELOPMENT PLANNING





12bit/MIX  
LP

LP

ATTACHMENT A  
This forms part of application  
# A19-0018



City of  
Kelowna

Planner  
Initials BC





12bit/MIX  
LD

LP



ATTACHMENT A  
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Planner Initials BC  
City of Kelowna  
DEVELOPMENT PLANNING



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LD

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# A19-0018



City of  
Kelowna  
DEVELOPMENT PLANNING

Planner  
Initials BC





12bit MIX

LP





ATTACHMENT A

This forms part of application  
# A19-0018

Planner  
Initials BC



LP

||

12bit/MIX

LD





**982 Old Vernon Rd  
Current Property Photos  
2018 and 2019**























































ryan@tntkelowna.com  
 250.826.4130  
 admin@tntkelowna.com  
 250-212-7073

982 Old Vernon Rd. Kelowna, BC

Kelowna's TNT Trucking Ltd. Site Plan for the remediation of 982 Old Vernon Road, Kelowna.

**Legend**

Black lines outline approximate areas TNT will use for

**Tailings Area** back right which will turn into a L shape along the back of the property are Tailings that have been screened once then decomposed wood fines are added to a blend of soils, subsoils, rock dusts, sands or gravels for the landscape industry and will need further decomposition to be re screened and or sorted @ a later date.

**TNT work area** e.g. crushing/screening equipment parking storage and maintenance area The trucking portion/contracting portion of our business does use this area how ever this is necessary as remediating the property is expensive and costs money ,soil sales could and or would not support or pay for this remediation , all activities and site related work pay for the remediation and are used in conjunction to do it essentially you can not have one or the other they work in conjunction with no funding provided this is how we can make an direct positive impact on the community, this area has been mostly remediated , its ideal to have our sand and rock screened separately to add to soil mixtures having the ability to make many different blends for different applications allows us to remove more material annually as well as allows us to dispose of the copious amounts of rock screened out of fill , soils , gravels, in some loads of fill we receive concrete as well as we find buried pockets of concrete, asphalt rock, wood, garbage and or metal on site to minimize costs of disposal crushing of aggregates e.g., rock, concretes, stones, bricks, etc is necessary as it would only add to the piles of material on site once crushed we sell them as backfill products in the construction industry.

**Blocked out area** on the right of the property is used for grinding mulching and composting of natural/milled wood, yard waste, calcium sulfate, lime, granite, basalts etc rock dusts, papers, cardboard, organics, any and all compostable materials.

The large pile behind our work area will get screened as required as it's the most labour intensive and time consuming, we are currently working along the far left side in-between the onsite road and the property to the left , the large area directly behind the main pile has been screened once an area of 150x150 we got 1500 plus yards for future mixing we will be moving piles closer to the back to allow easier screening and mixing and a broader work area as we sure up the ground with aggregates , approximately by the end of the 6 years tnt will have the mulch area completely remediated ready for new farming such as green houses cattle or new soil for grown what ever they choose. As well as area behind the pile which is 250x300 feet materials were any where from 4-15 feet deep/tall, tnt will do its best to remove metals , garbage , as finances allow , unusable materials either they need further decomposition further screening, TNT anticipates 15000-20000 yards to be removed off site , we use 10-30 percent of mill screenings in our mixtures with our compost/soil/sand/rock blends. TNT foresees increase of flat usable land of 1.5-3 acres within 6 years.

**Compost** we do in various locations trying to mitigate handling it more then needed and we blend mix and screen as we make room and what's most convenient and easiest.





982 Old Vernon Rd. Kelowna, BC



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250.826.4130  
admin@tntkelowna.com  
250-212-7073

**Equipment & Temporary Structures**

**Skid Steers** we use for sorting materials and loading small and mid size trucks and for screening etc

**Wheel Loader** used for loading larger trucks and mixing soils moving materials around and sorting

**Excavators** use in screening and digging as well as piling and sorting as well

**Wood Grinder/Shredder** for downsizing wood/ yard waste materials for further composting

**Jaw Crusher** used for reducing waste sizing for usable applications eg rock dusts for amendments road building , we use it to make fill materials for off site applications and for ground shoring , with out it screening the fill to mix with the woodwaste we would have an over abundance of piles of rock around adding volume to the property.

**Dump Trucks** for hauling material on and off site, pick ups for refueling, and staff etc.

**Office trailer (1), storage containers (3) and Tent (1)**





**ryan@tntkelowna.com 250.826.4130**  
**admin@tntkelowna.com 250.826.5774**  
982 Old Vernon Rd. Kelowna, BC  
www.tntkelowna.com

## **Kelowna's TNT Trucking Ltd. Guidelines for Remediation of 982 Old Vernon Road, Kelowna.**

### **Fire Suppression Plan**

Long term fire suppression plan is to be hooked up to BMID water supply all year while available.

TNT will regularly water compost piles to avoid ignition.

TNT will separate waste wood piles from green waste/composting piles.

TNT will provide a hose/hard lined plastic or PVC piping along the side of the property from front to back with minimum 3 connections along its length. Allowing for a fire hose to be connected to reach across the property in the event of a fire. TNT will also regularly water its compost piles to avoid ignition.

### **Dust Suppression**

Broken aggregates and wood mulch have already been installed and will be added to as needed on roadways and around the yard to keep dust to minimum. We will also use water as needed to suppress dust.

### **Noise mitigation**

TNT will operate within the allowed business hours of 7am through 6pm Monday to Friday for heavy equipment use and drop off of materials.

TNT would like to clarify this point as it pertains to our winter operations which are critical for funding the entire model; while we understand that the disposal of snow is not approved at any time, there would be a need for trucks and equipment to come and go from the yard at odd hours as the snowfall determines. Equipment would be pre-loaded during regular business hours as much as possible but there would still be some unavoidable engine noise from trucks. Please note this would involve drivers arriving at work and leaving with equipment, not coming and going repeatedly from the site.

### **Material Rational**

Sandy loam/topsoil/clay/fill (eg. dirt and rock) and green landscape waste is used to blend with the fines from the old Russo mill to reduce the volume of material on site. As TNT grinds/shreds/composts material, we use these organic materials to achieve a desired texture/composition/level of enriched organic matter for the soils that are then used in a variety of applications in the local landscape/construction industry. Allowing TNT to haul materials in to collect and process allows us not only to fund the sorting, mixing, and blending of soils that will eventually clean up the site but provides the raw materials required to do so.

Likewise, processing the green waste and chips helps pay for the costs associated with clean up that TNT absorbs. The carbon and nitrogen produced by the compost is critical for the soil blend and given that the ground waste and piles have metal, plastics, and rocks in them that require screening and then separation and sorting before grinding, revenue is required in order to process. This is expensive and time consuming as much of it must be done with a combination of equipment and hand work as well as the unrecyclable debris removed to the landfill.





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 982 Old Vernon Rd. Kelowna, BC  
 www.tntkelowna.com

These operations cover costs of labour, equipment, fuel, insurances, and taxes while also providing the raw materials make a product that can be sold in order to remediate the property.

**Estimated Projections**

Using a maximum mix ratio of approximately 25% mill waste to other material, At our current level of production, TNT estimates the need for roughly 7500 yards of earth material (soils/sands/clay/rock) and compost/woodchips at a pre shred volume of 7500 yards annually, in order to produce a goal of 5000 yards of mill wood waste reduced annually. Of these 5000 yards we would see approximately 20% left over. (Eg. boards too big to be screened/shredded/composted/decomposed, rocks etc.) This material gets further screened and then used as ground shoring/leveling or crushed etc.

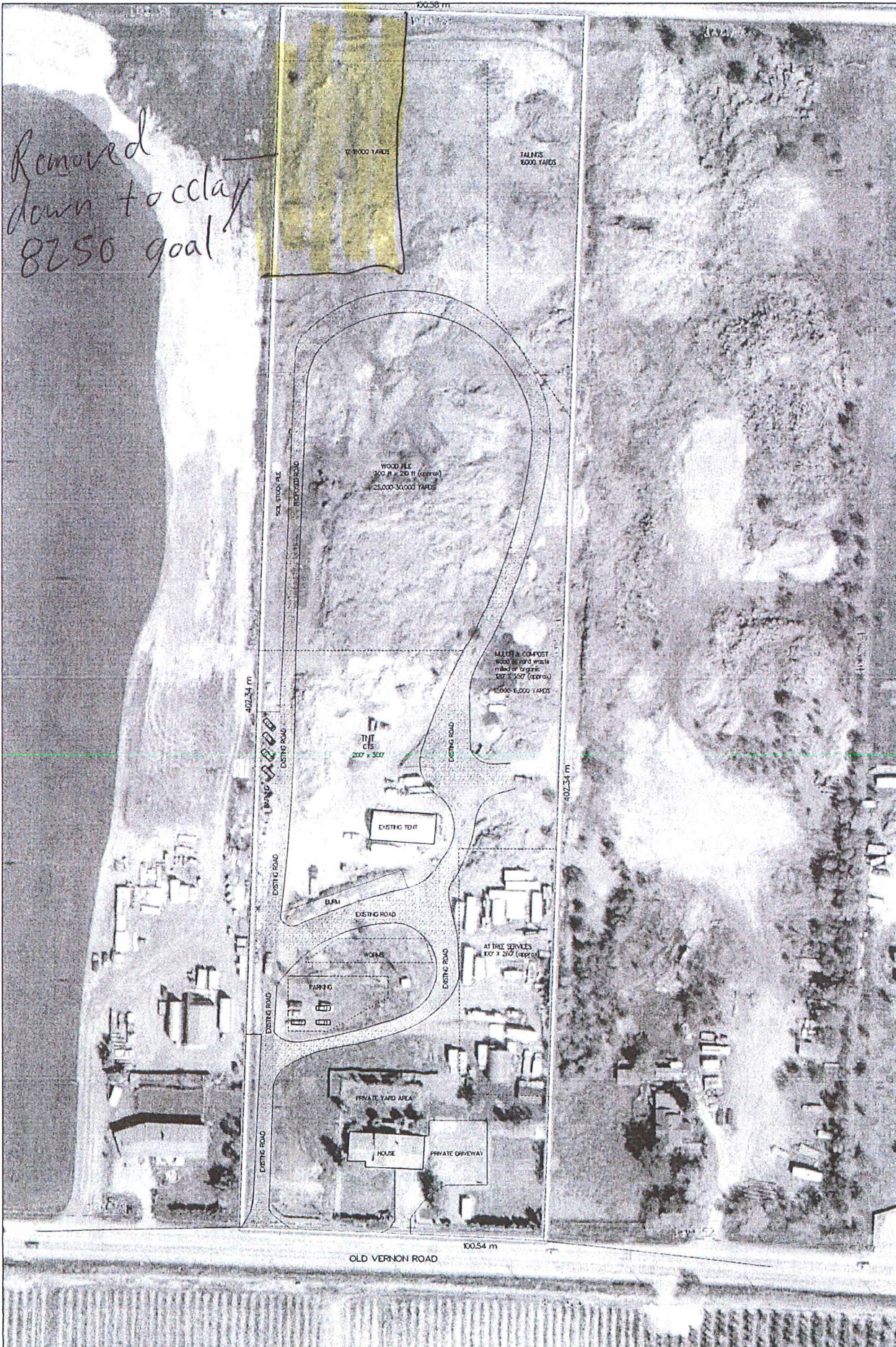
These estimates are based on the continuing trend of 10% growth of material reduction for the next few years. These are approximate numbers and could vary based on sales and demand and different products made

- 2020**  
7500 yards of granular materials soils sands rocks dirt etc., 7500 yards of green material. 5000 yards of mill waste to be excavated screened mixed and blended.
- 2021**  
8250 yards of granular materials soils sands rocks dirt etc., 8250 of green materials and 5500 of mill waste.
- 2022**  
9075 yards of granular materials soils sands rocks dirt etc., 9075 of green materials and of 6050 mill waste.
- 2023**  
9982.5 yards of granular materials soils sands rocks dirt etc., 9982.5 of green materials and 6655 of mill waste.
- 2024**  
10980.75 yards of granular materials soils sands rocks dirt etc., 10980.75 of green materials and 7320.5 of mill waste.
- 2025**  
12078.82 yards of granular materials soils sands rocks dirt etc., 82 of green materials and 8052.55 of mill waste. and









Legend

982 OLD VERNON RD  
KELOWNA BC

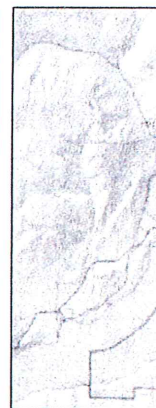


Notes

Scale: 1" = 32' 0"



2022  
Removed to clay My Map



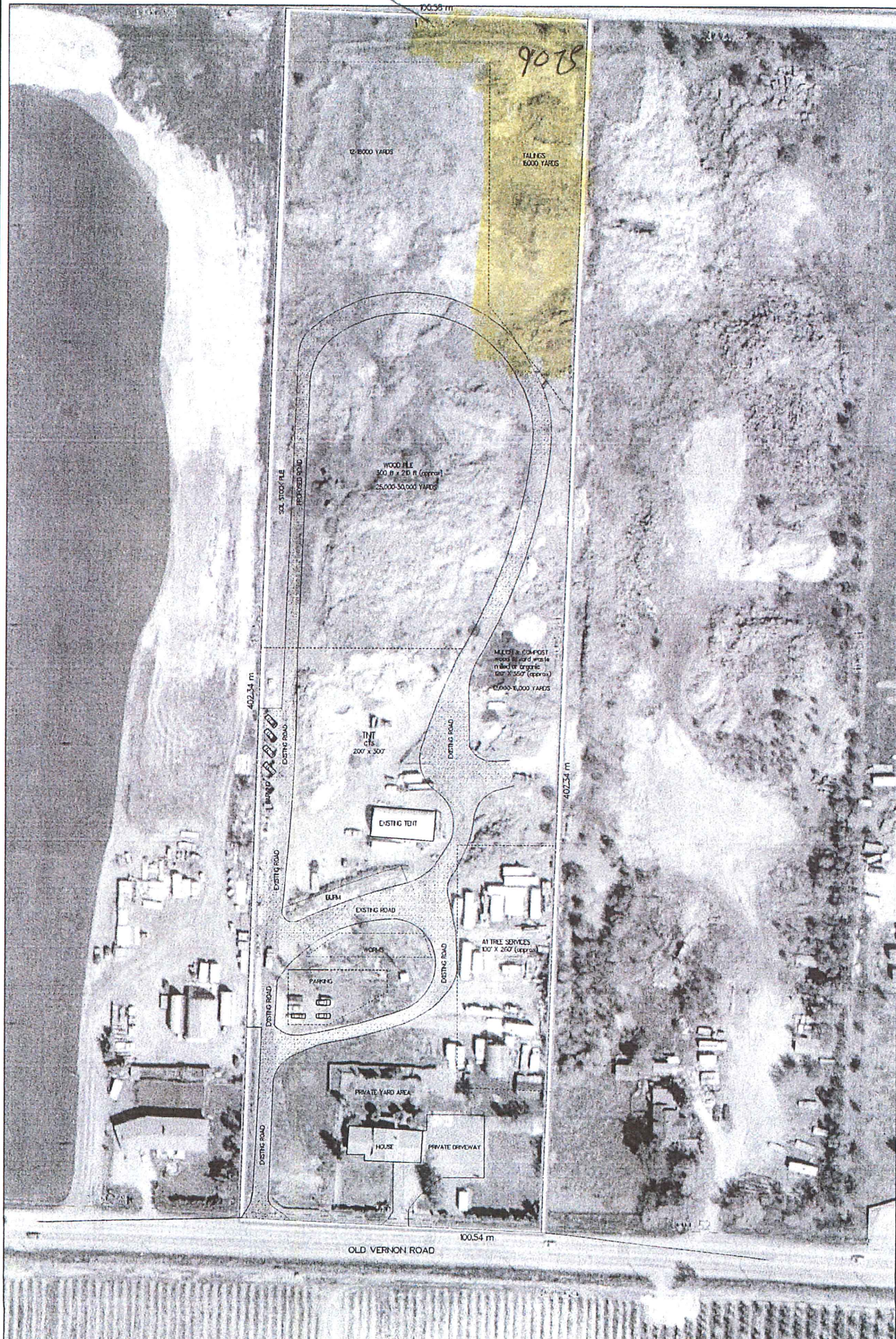
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982 OLD VERNON RD  
KELOWNA BC



Notes

1" = 32' 0"







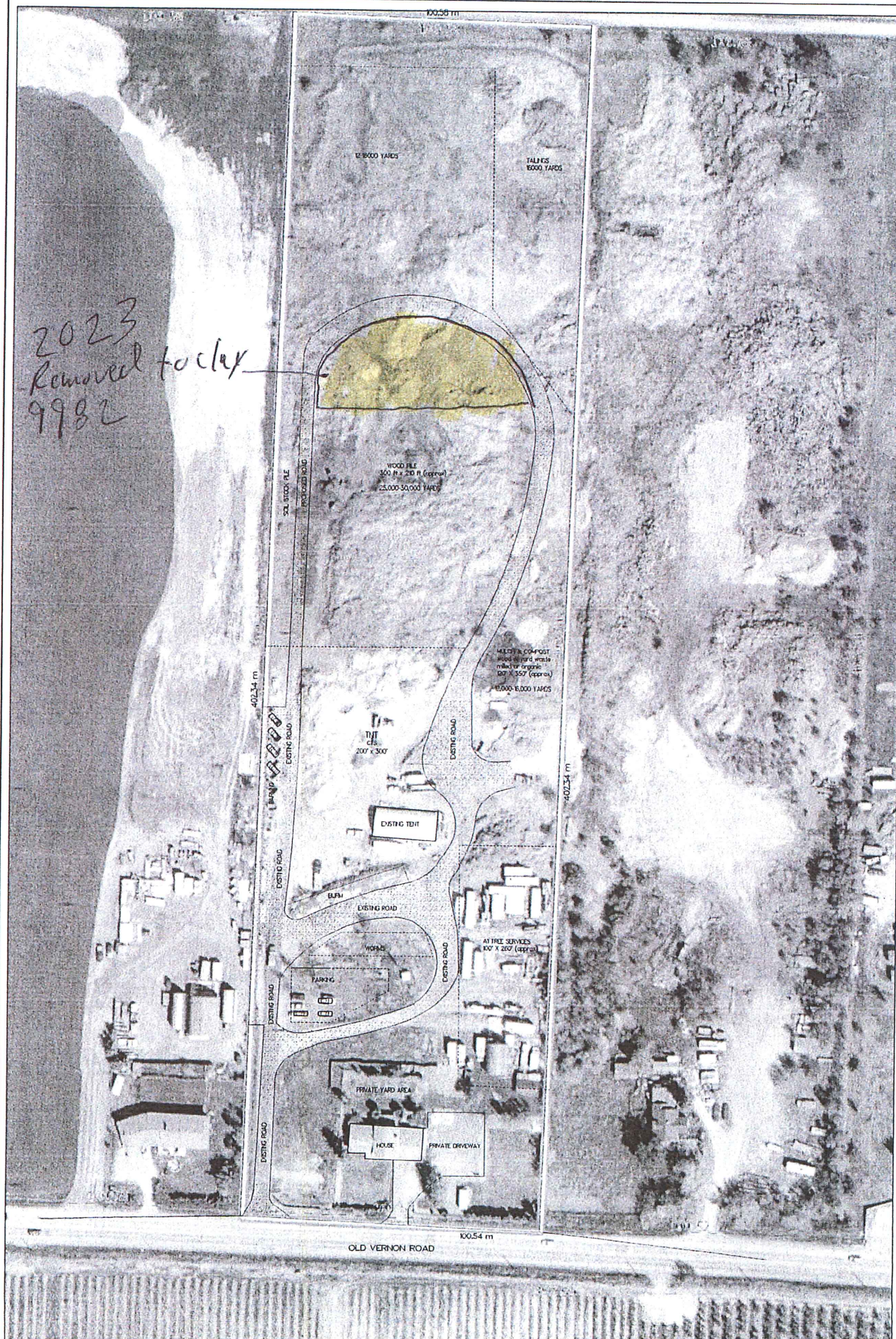
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KELOWNA BC

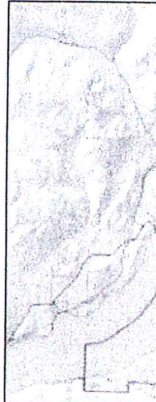
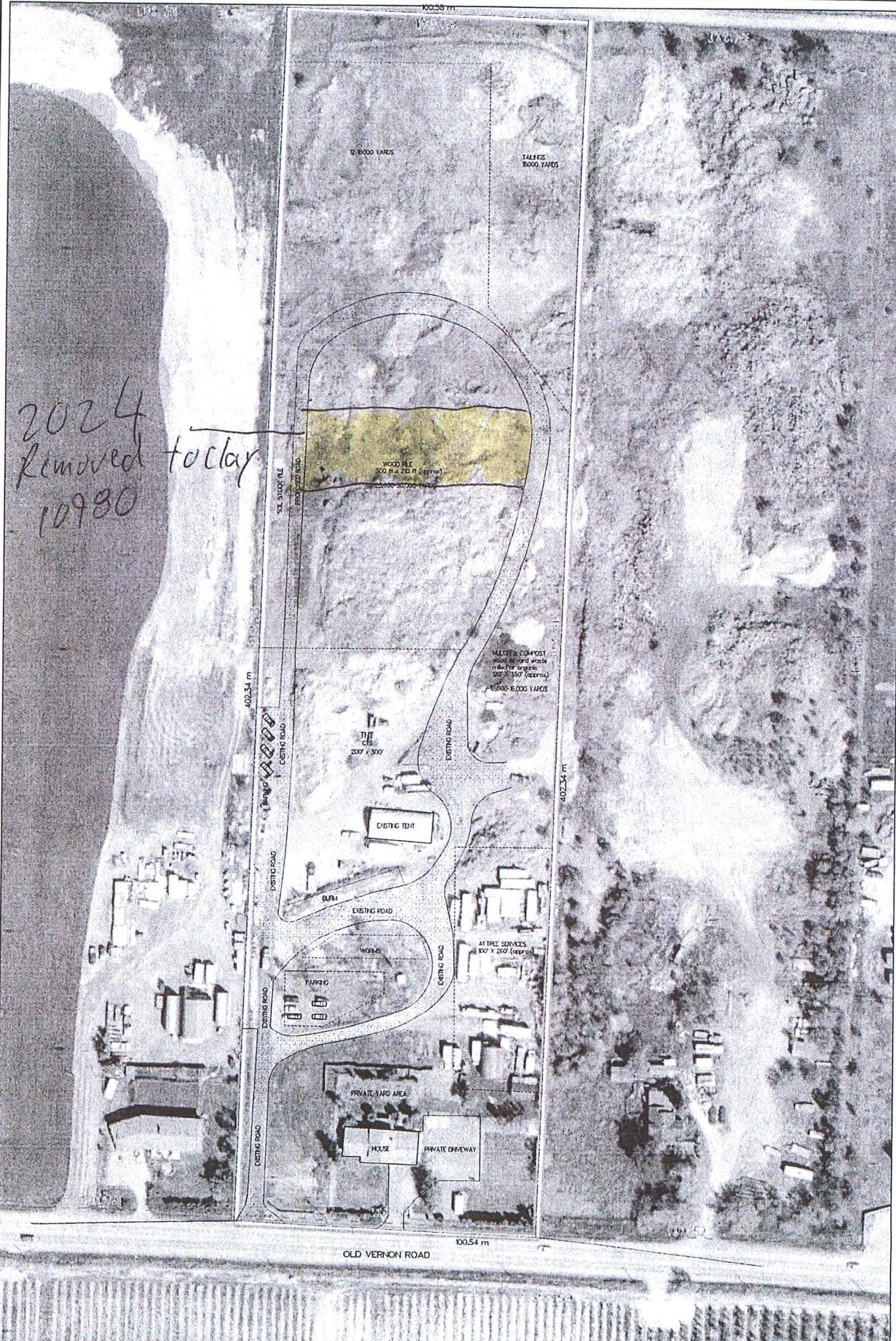


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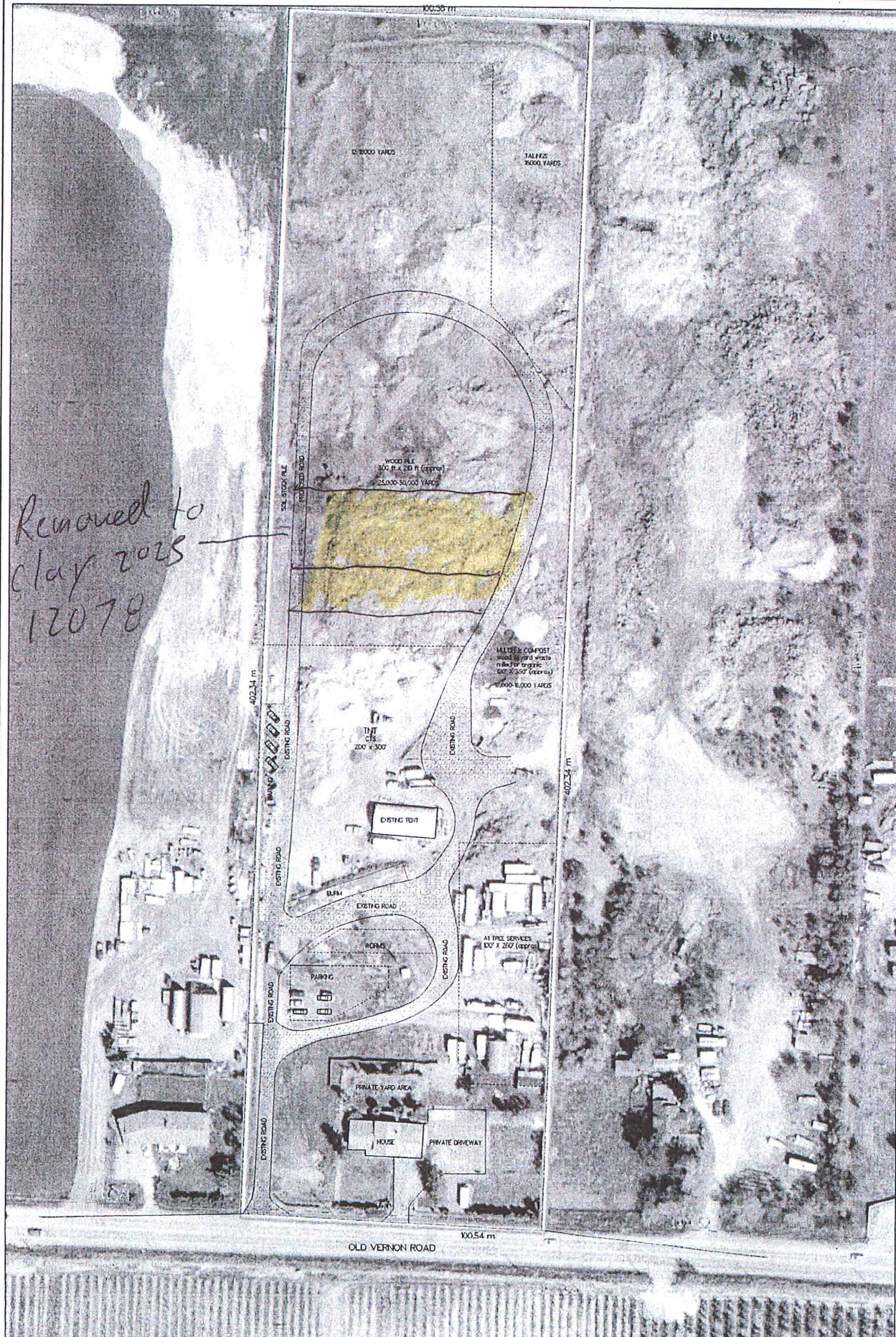
982 OLD VERNON RD  
KELOWNA BC



Notes

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Legend

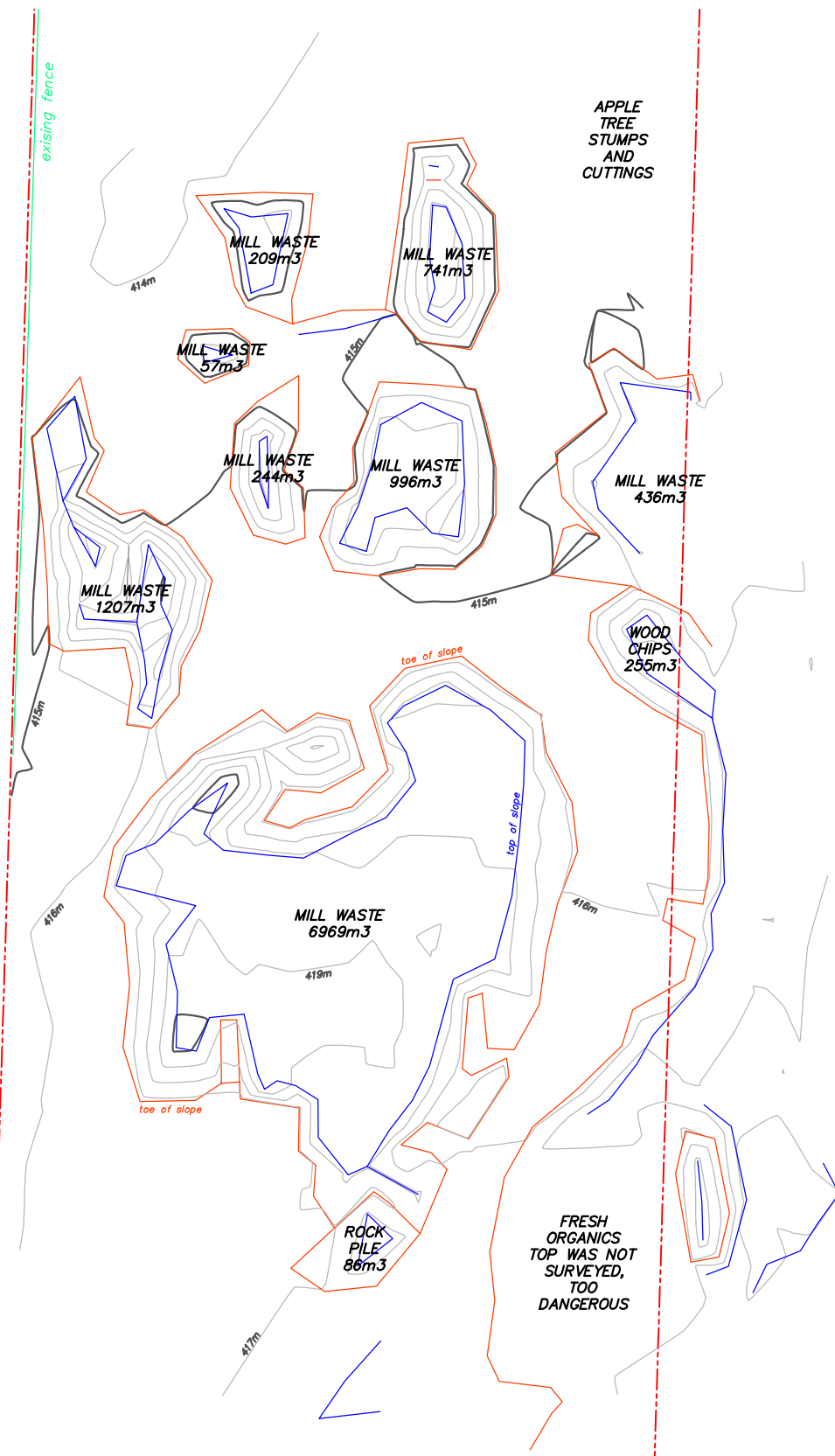
982 OLD VERNON RD  
KELOWNA BC



Notes

Scale: 1" = 32' 0"





APPLE TREE STUMPS AND CUTTINGS

FRESH ORGANICS TOP WAS NOT SURVEYED, TOO DANGEROUS

LOT 4 PLAN 546

LOT 3 PLAN 546

LOT 2 PLAN 546

PID: 012-206-687

Old Vernon Road

TITLE:

TOPO PLAN OF LOT 3, SECTION 1, TOWNSHIP 23, O.D.Y.D., PLAN 546 982 Old Vernon Road, Kelowna, B.C.

DRAWN: BC SURVEYORS

1858 Klondike Court (250) 859-4653 Lake Country, BC bcsurveyors@gmail.com V4V 1P2

CLIENT: TNT Services

SCALE: 1:1000 on 11"x17"

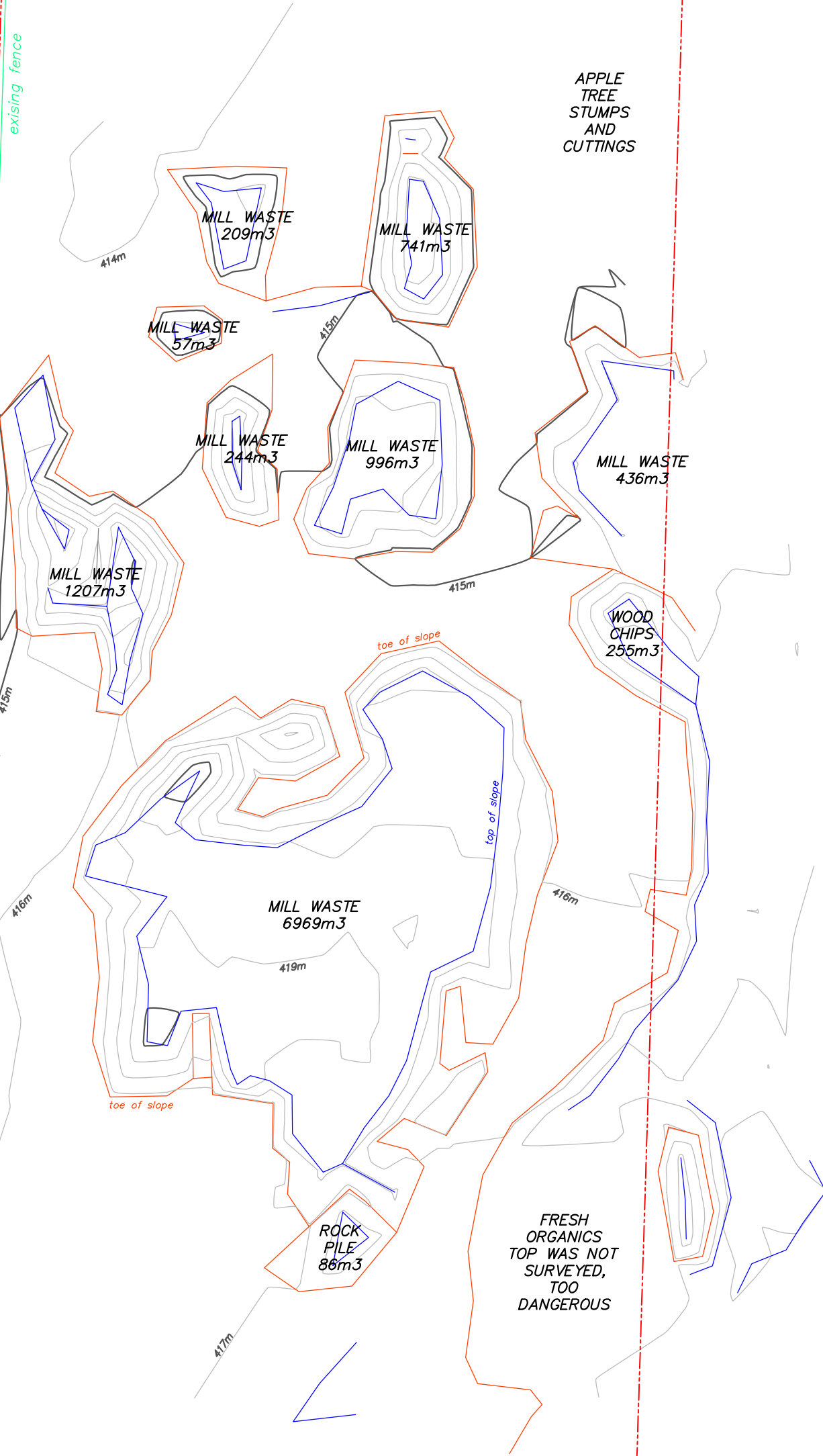
DATE: June 19, 2020

DWG: 20-142 Topo Plan

FILE No: 20-142 Rev. 1 67



GROUND IS AT  
 NATURAL CLAY



LOT 4  
 PLAN 546

LOT 3  
 PLAN 546

LOT 2  
 PLAN 546

PID: 012-206-687

TITLE:

**TOPO PLAN OF LOT 3, SECTION 1,  
 TOWNSHIP 23, O.D.Y.D., PLAN 546  
 982 Old Vernon Road, Kelowna, B.C.**

DRAWN: **BC SURVEYORS**

1858 Klondike Court (250) 859-4653  
 Lake Country, BC bcsurveyors@gmail.com  
 V4V 1P2

CLIENT: **TNT Services**

SCALE: **1:750 on 11"x17"**

DATE: **June 19, 2020**

DWG: **20-142 Topo Plan**

FILE No: **20-142 Rev. 1 68**



**ATTACHMENT** E

This forms part of application  
# A19-0018

Planner Initials **BC**

City of **Kelowna**  
DEVELOPMENT PLANNING



**Land Capability Assessment  
982 Old Vernon Rd., Kelowna, BC  
Lot 3, Plan 546, Section 1, Township 23, ODYD  
PID 012-206-687**

**For: Kandola  
982 Old Vernon Rd.,  
Kelowna, BC V1X 6T8**

**File: 12E043**

**January 9, 2013**



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## Executive Summary

Valhalla Environmental Consulting Inc. (VEC) was retained by Manraj and Jeetender Kandola (Landowners) of 982 Old Vernon Rd., Kelowna, BC to complete a Land Capability Assessment for agriculture on a parcel in the City of Kelowna, BC. The purpose of this inspection was to assess the agricultural capability and suitability of the Subject Property. The Clients requested this inspection to explore their land use options on the Subject Property that is wholly within the Agricultural Land Reserve (ALR).

The Subject Property is 982 Old Vernon Rd., Kelowna, BC and is legally described as Lot 3, Plan 546, Section 1, Township 23, ODYD, PID 012-206-687. The site is a 4 hectare (10 acre) parcel and is entirely contained within the ALR. The site was used as a wood mill from the 1950s to the 2000s.

This assessment determined that +/-91% (3.65 ha) of the property area has an unimproved rating of Class 5 agricultural capability due to a soil moisture deficit in the summer, and excess water conditions in the spring, fall and winter. This area is improvable to Class 3 with the addition of irrigation in the warm months and water control such as ditching and/or artificial drainage for the spring, fall and winter months. A root restricting layer and low perviousness were consistent across the property and represented a soil structure limitation of Class 3. The soil structure limitation is less severe than the soil moisture limitations and may be improvable by an intensive and costly process of removal of poor quality admixed fill, decompaction of the underlying clay layer, and replacement of top soil to a depth of at least 0.75m.

The Subject Property was included in the ALR when the reserve was established (1974-1976), but apparently was permitted to continue with the industrial non-farm use (sawmill) that pre-dated the ALR. As the mill operated into the mid 2000's cumulative impacts have occurred over 35+ years since the inclusion of the Subject Property into the ALR. The Landowners report that to the best of their knowledge, the Subject Property has not been used for agricultural purposes since the 1950's. Site improvements have been done by the current Landowners to remediate some of the impacts of the historic use and rehabilitate the site. Though significant, these improvements have not been completed as they have proved to be economically non-feasible for an end-use of agricultural purposes. The recovery of the rehabilitation and improvement expenses by an agricultural production operation would be unlikely and may prove to be economically prohibitive.

While the landowners are exploring several options for future land uses of the Subject Property, they have not decided upon a specific activity at this time. However, due to the significant amount of site rehabilitation yet required, it may be difficult for them to recover their total investment costs.

The Subject Property does not contribute to regional and local Agricultural Capacity. The Subject Property has not been farmed since the 1950's, during which time it



appears that the agricultural capability has continued to deteriorate. Continued industrial use on the Subject Property will not adversely affect the local Agricultural Capacity.



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APPENDICES

APPENDIX A: Maps & Figures – 982 Old Vernon Rd., Kelowna BC

APPENDIX B: Site & Soil Pit Photos - 982 Old Vernon Rd., Kelowna BC

APPENDIX C: Agricultural Capability Reference Documents (Excerpts)

APPENDIX D: Analytical Data - 982 Old Vernon Rd., Kelowna BC



## **1 Introduction**

### **1.1 Report Description**

Valhalla Environmental Consulting Inc. (VEC) was retained by Manraj and Jeetender Kandola, land owners of 982 Old Vernon Rd. Kelowna, BC, to complete a Land Capability Assessment for agriculture on a parcel in the City of Kelowna, BC. The purpose of this inspection was to assess the agricultural capability and suitability of the Subject Property. The Client requested this inspection to explore their land use options on the Subject Property that is wholly within the Agricultural Land Reserve (ALR).

### **1.2 Proposed Land Use & Agricultural Development Plan**

The purpose of the assessment is to classify the land capability for agriculture of the site to explore land use options for the Subject Property. The proposed future land use is industrial.

### **1.3 Statement of Qualifications**

Matthew Davidson, P.Ag., Senior Environmental Scientist, Assessor

Matthew is an Environmental Scientist and consulting Professional Agrologist with 11 years experience in environmental assessments, impact assessments, soil surveys, land remediation, reclamation and ecological restoration. Matthew has been a registered professional agrologist (PAg) in British Columbia since 2008.

Catherine Orban, P.Ag., Senior Agrologist, Report Review

Catherine Orban has a Master of Science Degree in Geography, specializing in Soil Science. She has been conducting soils assessments since 1985. She has been a registered professional agrologist (PAg) since 1999, first in Alberta, and later in British Columbia. Catherine has worked on a variety of soils assessment, management, remediation and reclamation projects in the agricultural, oil and gas, and environmental sectors in both provinces.



## 2 Site Conditions & Land Use

### 2.1 Site Conditions

The Subject Property is 982 Old Vernon Rd., Kelowna, BC and is legally described as Lot 3, Plan 546, Section 1, Township 23, ODYD, PID 012-206-687. The site is a 4 hectare (10 acre) parcel and is entirely contained within the ALR. The site is approximately level and was used as a wood mill from the 1950s to the 2000s. See Appendix A Figures 1 & 2 for more detail on site size and location.

### 2.2 Land Use: Subject Property and Surrounding Area

Approximately 0.36 ha of the property is built upon and used for the residential purposes at this location. Buildings on the Subject Property include one house and storage shed. Outside of the buildings is residential yard and parking area. The remaining area 3.64 ha has been used historically as the mill site. Wood waste, equipment parking and gravel roads encompass this area. Past agricultural uses were unknown to the landowner as the site has operated as a mill from the 1950's to 2005.

The zoning for the subject property is Agriculture 1 (A1) which permits 4 ha lots, except when in the ALR where 2 ha lots are permitted. A1 zoning also allows one detached home, one mobile home and one accessory building home per lot.

Adjacent properties to the south, east and west have Agriculture 1 (A1) zoning. Southeast of the property is a subdivision (outside of the ALR) that has been constructed with a combination of Rural Residential 3 (RR3) (this zoning permits 1 ha lots un-serviced and fully serviced lots at 0.16ha) and Two Dwelling Housing (RU6) (allowing lot sizes down to 0.04 ha). West southwest of the property is a property with Parks and Open Spaces (P3) zoning which remains in the ALR and is used as a golf driving range. The properties adjacent to north are cultivated fields and are in the RDCO.

Table 1: 982 Old Vernon Rd., Kelowna, BC – Surrounding Land Use

Location	Land Use	ALR Status	Approximate Lot Size ha
Subject Site	old mill / residential	In	4
North	residential / hay field	In	8
Northwest	golf course	Out	43
West	hayfield / commercial lot	In	4
South	hayfield / residential / RV parking	In	8
Southeast	subdivision	out	18
East	old mill / residential / commercial	In	4



### **2.2.1 Historic Land Use**

The Subject Property was included in the ALR when the reserve was established (1974-1976), but apparently was permitted to continue with the industrial non-farm use (sawmill) that pre-dated the ALR. As the mill operated into the mid 2000's cumulative impacts occurred over 35+ years from the inclusion of the Subject Property into the ALR. The Landowners report that to the best of their knowledge, the Subject Property has not been used for agricultural purposes since the 1950's. To date, a number of site improvements have been completed to remediate some of the impacts of the historic industrial use and rehabilitate the site. Though significant, these improvements and rehabilitation have not been completed as they have proved to be economically non-feasible for an end-use of agricultural purposes. A summary of the remediation work to date and estimated costs of remaining agricultural rehabilitation can be viewed in below, sections 2.2.2 and 2.2.3.

### **2.2.2 Improvements to Date**

The current Landowners obtained the Subject Property in 2005. Since 2005 the Landowners have undertaken the following improvements to remediate some of the impacts from historic land uses. The information for improvements to date has been provided by the Landowner, Manraj Kandola through personal communication (pers.comm. – MK). All costs are approximate.

2005

- Land purchased by current owners 4.01 ha (10 acres) at 982 Old Vernon Rd metric is generally used for volume and area calculations – eg.0.75 m topsoil
- Upon purchase Landowners shut the sawmill down, as it was outdated and hazardous.
- ~122,330 m<sup>3</sup> (160,000 yards<sup>3</sup>) of wood waste was stockpiled on the Subject Property at this time

2006

- Controlled curtain burner set up for 3 months to eliminate wood waste
- Approximately \$100,000 was spent to reduce total wood waste volume

2007

- Numerous fires caused by spontaneous combustion of the wood waste
- City of Kelowna, Fire Department attended the site numerous times
- Largest fire attended by City of Kelowna fire department required them on site for 3 days to containing the fires, which cost the City of Kelowna approximately \$80,000.
- Private water tankers and excavators were employed full time by the Landowners to control the fires
- Landowners purchased fire equipment for the site at a cost of \$50,000

2008-2011

- Contractor hired to screen and truck the wood waste to a cogeneration plant in Armstrong, BC (Tolko)



- \$25,000 in additional costs incurred
- Wood waste screening (~75% of volume remaining) was done to mitigate fire risks and facilitate further site rehabilitation
- An oversized pile of wood waste remains which requires grinding
- As of 2012, approximately 100,000 m<sup>3</sup> (130,000 yd<sup>3</sup>) of the original 122,330m<sup>3</sup> (160,000 yd<sup>3</sup>) of wood waste have been processed and/or removed from Subject Property. Currently, approximately 23,000m<sup>3</sup> (30,000 yd<sup>3</sup>) of wood waste remains on the Subject Property.

Approximate costs incurred to date for rehabilitation by property owners: \$175,000; and

Cost to City of Kelowna for Fire Protection: \$80,000

### 2.2.3 Future Improvements

To be suitable for intensive soil bound agriculture, the Subject Property requires additional rehabilitation and improvements including:

- Wood waste grinding of oversized materials, approximate costs provided by a grinding contractor \$150,000 (pers.comm. – MK)
- Import and spread clean topsoil to a depth of 0.75m for 3.65 hectares (27,375m<sup>3</sup> or 35,805 yd<sup>3</sup>)

#### Soil Cost Estimate

- 27,375m<sup>3</sup> needed at \$26/m<sup>3</sup> = \$711,698
- Soil costs were determined by an average of quoted prices from 4 suppliers in the Kelowna area for large volume sales.

#### Trucking Cost Estimate

- Assume trucking cost of \$ 119.5/hr
- Assume 18m<sup>3</sup> (24yd<sup>3</sup>) truck & pup = 1520 truck loads for
- Assume 1hr trip per load = 1520 hrs
- Trucking cost of 1520 x 117.66/hr = \$ 178,941

Trucking costs were determined by an average of quoted prices from 4 service providers in the Kelowna area.

\*Costs for spreading and grading were not included in this estimate

The estimated remaining cost for remediation of this site for agricultural purposes is approximately \$1,040,639

### 2.2.4 Brownfield Concerns

Due to the historic uses of the subject lot and current uses on neighbouring lots, there is potential for contamination of soils and, or groundwater on the Subject Property. Site investigations with respect to contamination and land remediation are outside the scope of this assessment, but may be required prior to returning this property to agricultural or alternative uses. The cost of such investigations and land remediation has not been included in this assessment but should not be overlooked in consideration of future uses on the Subject Property. Such assessments are costly



as are any soil or groundwater remediation projects. Site investigation costs may be required and would therefore add to the cost of total remediation before the site may be used for future purposes (for example: industrial, residential, agricultural).

### **3 Soils Information**

Soil conditions are a key factor in determining the overall agricultural capability and suitability of any given site. The soil conditions on the Subject Property are described in this section including; published government survey information and a description of the existing soil conditions, based on the lab data and observations made during the on-site inspection, conducted on October 24, 2012.

#### **3.1 Government of British Columbia – Soil survey**

Baseline soils information was obtained from the BC Ministry of Environment (MOE) Soils of the Okanagan and Similkameen Valleys, which comprises Report No. 52 of the BC Soil Survey (1986); and the accompanying mapping at 1:20,000 scale. The Subject Property is found on Mapsheet 82E.094 (Appendix A, Figure 5), which indicates that three soil complexes are found on the parcel. The general characteristics of these soils are summarized in Table 2, below:



Table 2: 982 Old Vernon Rd. Kelowna BC – Surrounding Land Use

Site Map Polygon	80% Westbank (WK) / 20% Summerland (SR)	100% Westbank (WK)	100% Glenmore (GL)
Location	The northwestern corner	Northeast / Central portion	Southern Portion of the property
Landform	Nearly level to strongly sloping stratified glaciolacustrine sediments / Nearly level to moderately sloping stratified glaciolacustrine sediments	Nearly level to strongly sloping stratified glaciolacustrine sediments	Nearly level to moderately sloping stratified glaciolacustrine sediments
Description	100 or more cm of clay, clay loam or silty clay / 100 cm or more of silt loam, silty clay loam or clay loam	100 or more cm of clay, clay loam or silty clay	100 cm or more of silt loam, silty clay loam or clay loam
Soil Profile Drainage	Moderately well / Well to Moderately Well	Moderately well	Well to moderately well
Stone Content	non-stoney	non-stoney	non-stoney
Agricultural Suitability	(WK) Tree fruits, Vineyards, Hay production, Pasture / (SK) Poorly suited for arable agriculture	(WK) Tree fruits, Vineyards, Hay production, Pasture	(GL) Pasture, Hay, Tree Fruits
Soils	Othic Grey Luvisol / Eluviated Dark Brown	Othic Grey Luvisol	Eluviated Dark Brown

Source: MoE, Technical Report 52, Soils of the Okanagan and Similkameen Valleys, which comprises Report No. 52 of the BC Soil Survey (1986)

### 3.2 Soils on Site Inspection – Methods

Three soil test pits (TP1 to TP3) were excavated to depths of 130 cm by a small tracked excavator on October 24, 2012. All test pits were located on sites that represented variations in topography, vegetation, land use and, or mapped soil characteristics. The soil test pits and site features were mapped and photographed (Appendix A, Figures 7 & 8; and Appendix B). The soil profiles were examined and described according to conventions from the Canadian System of Soil Classification, Third Edition (Soil Classification Working Group, 1998). It was not within the scope of this assessment to examine the soils for the purposes of classification at the Series level. A total of 8 representative soil samples were taken from all of the test pits and submitted for laboratory analysis of one or more of the following parameters: various soil nutrients, pH, electrical conductivity, available water storage capacity, and soil particle sizes/textures. (Appendix D).

Four soil units were identified on the Subject Property (as indicated by Roman numerals I - IV) through the detailed soils assessment at a mapping scale intensity of +/- 1:3,000 (Appendix A, Figure 9; and Table 3, below). Information obtained



during the site inspection was combined with the lab results to provide site-specific details that were used to fine-tune the soils data presented in Soil Report No. 52 (1986), which was based on mapping at 1:20,000. The soil units were primarily defined by soil physical and morphological properties. The profiles at each test pit within each unit shared a number of similarities including horizon properties, depths and sequences. Detailed test pit logs and photographs have been included with this report (Appendix B, Photos 3-9). The soil units as mapped for the Subject Properties at a scale of +/-1:3,000 are described in Table 3, below

**TABLE 3: 982 Old Vernon Rd., Kelowna, BC - Site Inspection : Soil Unit Summary**

Soil Unit	Test Pits	Top Soil Depth (cm) / Colour	Soil Profile Texture <sup>1</sup>	Stone Content <sup>2</sup>	Soil Profile Drainage	Topography	Land Use	Area (ha)	%Total Area	Notes
I	1	54 / Br	Sandy Loam / Clay / Heavy Clay	10% / 0% / 0%	Poorly Drained	Nearly Level Slope 1%	Former Mill Yard	0.59	15%	Mixed soil in top layer with wood waste
II	2	15 / DkBr	Clay / Clay / Heavy Clay	10% Gravel / 0% Gravel / 0% Gravel	Poorly Drained	Nearly Level Slope 1%	Former Mill Yard	2.02	50%	Mixed soil in top layer with wood waste, rooting depth 30cm
III	3	35 / Br	Loam / Heavy Clay / Heavy Clay	non-stoney	Poorly Drained	Nearly Level Slope 2%	Former Mill Yard	1.04	26%	Mixed soil in top layer with wood waste, rooting depth 30cm
VI	NA	NA	NA	NA	NA	Gentle slope 5%	House, shed, yard	0.36	9%	Residential portion of the lot

<sup>1</sup> based by laboratory testing

<sup>2</sup> visual observation

### 3.3 Comparison to BC Government Soil Survey & Mapping

With the exception of the extensively disturbed upper, admixed fill-soil horizon, the distribution of soil types as identified in the site inspection was generally consistent with the information presented in Soil Survey Report No. 52. In general, the minor differences in soil mapping have been attributed to the different scale intensities as they applied to the site. The BC Soil Survey is based on generalized mapping at a scale of 1:20,000, which is too broad to capture all the subtle variations in site conditions that were identified during the site inspection which was conducted at a detailed mapping scale intensity of +/- 1:3,000.



## **4 Climatic Capability for Agriculture**

Climatic capability for agriculture is based on the limitations associated with the combined influence of the climate and soil moisture regimes as well as the thermal limitations for any given location. Climatic capability is a modifying component used in determining the overall agricultural capability and suitability of a given site. The climatic capability for agriculture of the Subject Property is described in this section; beginning with published government information, followed by that obtained during the on-site inspection.

### **4.1 Government of British Columbia – Climatic Capability**

General reference information as well as baseline climatic data for the Kelowna area was found in Climatic Capability for Agriculture (BC Ministry of Environment, 1981), and Land Capability Classification for Agriculture in British Columbia, Manual 1 (BC Ministry of Agriculture and Food and Ministry of Environment, 1983).

It is important to note that the climatic capability ratings are based entirely on climatic conditions (primarily precipitation and temperature) at a given site. Soil characteristics and other site conditions are not considered in these ratings. The overall agricultural capability of the Subject Property is addressed in Section 5 of this report.

The MOE Technical Paper 4; Climate Capability Classification for Agriculture in British Columbia and accompanying mapping 82E/NW indicates the area of the Subject Property sits on a boundary between Class 5 (west portion) or 6 (east portion) improvable to Class 1bF / 1cG respectively, which indicates an estimated annual climatic moisture deficit (CMD) of 350 mm (BC MOE, 1981, Table 1). Class 5 land has restricted use for perennial forage and specially adapted crops. Class 6 land is considered non-arable but capable of producing native or uncultivated perennial forage crops. Soil moisture deficiency (A) is indicated as a primary limitation. Areas in Class 1aF have occurrences of minimum temperature near freezing that adversely affect plant growth during the growing season. Areas in Class 1cG have insufficient heat units during the growing season. See Appendix A Figure 7 for more detail.

### **4.2 Site Inspection**

Site-specific climatic capability for agriculture was determined using data from TP1-TP3 which are located in, and representative of, different soil units throughout the Subject Property. Lab data obtained for the soil samples was used in conjunction with published regional data to calculate the available water storage capacity (AWSC) and soil moisture deficit (SMD) values for the upper 50 cm of the soil profiles. The results were used to determine site-specific climatic and soil capability ratings for agriculture on the Subject Property which have been summarized in Table 4, below. A description of agricultural/climatic capability classifications is found in Appendix C.



**TABLE 4: 982 Old Vernon Rd., Kelowna BC - Soil Moisture Balance & Climatic Capability Ratings**

Site & Soil Horizon	Soil Moisture Balance							Climate Capability Rating				
	Total Depth	Matrix Texture	Matrix AWSC <sup>1</sup>	Matrix Fraction	CF Adjusted AWSC	Interval AWSC	Climate H <sub>2</sub> O Deficit <sup>2</sup>	Soil H <sub>2</sub> O Balance <sup>3</sup>	Unimproved H <sub>2</sub> O Subclass <sup>4</sup>	Improved H <sub>2</sub> O Subclass <sup>4</sup>	Thermal Rating <sup>2</sup>	Improved Overall Subclass
	cm	lab	mm/cm	lab	mm/cm	mm	mm	mm				
TP1/SU-I												
Fill*	50	SL	0.75	0.89	0.67	33.53						
<b>Interval</b>	<b>50</b>					<b>33.53</b>	<b>350</b>	<b>-316.48</b>	<b>5A</b>	<b>3A</b>	<b>1aF</b>	<b>3A</b>
TP2/SU-II												
Fill	15	C	2.22	0.89	1.98	29.77						
B	20	C	1.33	1.00	1.33	26.57						
C**	15	HC	1.37	1.00	1.37	20.53						
<b>Interval</b>	<b>50</b>					<b>76.87</b>	<b>350</b>	<b>-273.13</b>	<b>5A</b>	<b>1</b>	<b>1aF</b>	<b>1</b>
TP3/SU-III												
Fill	35	L	1.99	0.79	1.58	55.16						
B	15	HC	1.48	1.00	1.48	22.13						
<b>Interval</b>	<b>50</b>					<b>77.30</b>	<b>350</b>	<b>-272.70</b>	<b>5A</b>	<b>1</b>	<b>1aF</b>	<b>1</b>

\* Used Ap data for TP2 as top horizon was similar in texture and coarse fragment content

\*\* Used Ap data for TP1 as top horizon was similar in texture and coarse fragment content

<sup>1</sup> From Lab Data

<sup>2</sup> Technical Paper 4, 1981, MoE Climatic Capability Classification for Agriculture in British Columbia

<sup>3</sup> (Interval AWSC) - (Climate H<sub>2</sub>O Deficit) = Deficit (negative) or Surplus (positive)

<sup>4</sup> Based on - MoE Manual 1 (BC Ministry of Environment, 1983)

### 4.3 Comparison of BC Government and On-Site Inspection Ratings

In general the site inspection finding showed that the climatic capability for this location corresponds with the provincial climatic capability mapping. Approximately 76% of the Subject Property was rated at Class 5 improvable to Class 1. Approximately 15% of the Subject Property was rated at Class 5 improvable to Class 3. The remaining 9% of the Subject Property was not assessed as it was deemed unavailable for agricultural use. The differences between the site inspection findings and provincial mapping are in part due to the different scale intensities as they applied to the Subject Property. The MOE ratings were based on mapping at a scales of 1:100,000, which are not intended to account for the all the subtle variations in site-specific conditions (eg. soil texture, coarse fragment content, topography, slope angle and aspect) that were identified during the on-site inspection, at a detailed mapping scale intensity of +/- 1:3,000.

Please see Section 5.3 for a comparison between the overall agricultural capability mapping by MOE (including climatic capability) and the capability as determined by this assessment.



## 5 Agricultural Capability

Agricultural capability ratings are site-specific and based primarily on the influence of soils and climate, as modified by topography for any given location. The Canada Land Inventory (CLI) rating system uses a variety of measurable parameters (some of which are listed below) to provide objective classifications of agricultural capability:

- Slope angle and complexity;
- Depth to bedrock;
- Soil moisture deficits;
- Excess soil moisture;
- Coarse fragment content (stoniness);
- Soil texture;
- Depth to groundwater;
- Soil fertility; and
- Soil salinity

This interpretive system groups soils into seven classes according to potentials and limitations for agriculture (See Appendix C for capability class and limitation descriptions). Lands in Classes 1 to 4 inclusive are considered capable of sustained production of common cultivated field crops. Class 5 lands are capable of use only for producing perennial forage crops or specially adapted crops. Class 6 lands are capable of only providing sustained natural grazing for domestic livestock. Class 7 lands are incapable of use for either arable culture or grazing. (BC Ministry of Agriculture and Food, and Ministry of Environment, April 1983).

In most cases, both "unimproved" and "improved" agricultural capability ratings are determined for the area that is under consideration. The unimproved rating reflects the capability of the property in its natural or current state. The improved rating is theoretical and represents the anticipated agricultural capability of the property after improvements (eg. irrigation, enhanced drainage, soil amendments, fill placement, stone-picking, and/or subsoil decompaction) are made to mitigate the limitations. Some limitations, such as shallow bedrock, slope complexity and slope angle, are not considered to be improvable under "typical farming practices".

### 5.1 Government of British Columbia – Agricultural Capability

General reference information for agricultural capability was provided by Land Capability Classification for Agriculture in British Columbia, Manual 1 (BC Ministry of Agriculture and Food and Ministry of Environment, 1983; Appendix C). Site-specific agricultural capability mapping for the Subject Property was found on Mapsheet 82E.094 @1:20,000 (BC Ministry of Environment, 1987). (Appendix A, Figure 6).

The MOE agricultural capability polygons corresponded directly to the soil polygons mapped in Soil Survey Report No. 52, and are summarized in Table 5, below:



TABLE 5: 982 Old Vernon Rd., Kelowna BC- MOE Agricultural Capability Mapping @ 20,000

Location	Agricultural Capability Rating	
	Unimproved	Improved
Northwestern Area	8:8AD 2:6WN	8:3D 2:4WD
Northeastern and Central Area	4AD	3D
Southern Area	3AD	7:3D 3*3D

A - Soil Moisture Deficit  
 D - Soil Structure  
 N - Salinity  
 W - Excess Water

### Soils on Site Inspection

The overall agricultural capability ratings for the Subject Property were mapped and then compared to the soil unit polygons as defined by the site inspection (Section 3.2, above). In this case, the boundaries for the agricultural capability (AC) Units as determined by the field investigation (indicated by numbers 1-3) do not entirely correspond to those mapped for the soil units (Appendix A, Figures 9 and 10). AC unit 1 corresponds with SU 1. AC unit 2 is comprised of SU 2 and 3. Information obtained from the field inspection was combined with published soils, topography and climate data (as described in Sections 3.0 and 4.0) then applied to the criteria presented in MOE Manual 1 to determine the site-specific agricultural capability ratings at a mapping scale intensity of +/-1:3,000. The agricultural capability ratings for the Subject Property, based on the site inspection are summarized in Table 6, below:

**TABLE 6: 982 Old Vernon Rd., Kelowna BC- Site Inspection: Agricultural Capability Ratings**

Soil Unit	Ag Capability Unit	TP	Unimproved Ag Capabiltiy <sup>2</sup>	Improved Overall Ag Capability <sup>2</sup>	Area (ha)	% Total Area <sup>3</sup>
I	1	1	5AW	3WAD	0.59	15%
II	2	2	5AW	3WD	2.02	50%
III		3	5AW	3WD	1.04	26%
IV	3	NA	NA	NA	0.36	9%
Total					4.01	100%

<sup>1</sup> Ratings based on lab results & field investigation. See Table 7 for class descriptions

<sup>2</sup> See appendix C for Capability descriptions

<sup>3</sup> Estimates based on lab results, field investigations and aerial photography

Excess water during the wet months, and soil moisture deficits in the growing season were identified as the most extensive and severe limitations to agricultural capability on the Subject Property. Undesirable soil structure was considered to be an extensive, but less severe limitation.

AC Unit 1 (including Soil Unit I) accounts for +/- 15% (0.59 ha) of land on the Subject Property. This area was rated at Class 5 (unimproved) due to a soil



moisture deficit in the summer, and excess water conditions in the spring, fall and winter. This area is improvable to Class 3 with the addition of irrigation in the warm months and water control such as ditching and/or artificial drainage for the spring, fall and winter months. Irrigation is expected to raise the soil moisture deficit ("A") limitations to Class 1 throughout this agricultural capability unit. A root restricting layer and low perviousness were consistent across the property and represent a soil structure limitation of Class 3 that may be improvable by removal of poor quality admixed fill, decompaction of the underlying clay layer and replacement of top soil to a depth of at least 0.75m.

AC Unit 2 (including Soil Units II & III) accounts for +/-76% (3.06 ha) of land on the property. This area was rated at Class 5 (unimproved) due to a soil moisture deficit in the summer, and excess water conditions in the spring, fall and winter. This area is improvable to Class 3 with the addition of irrigation in the warm months and water control such as ditching and/or artificial drainage for the spring, fall and winter months. Because of the coarse texture of the soils in this agricultural capability unit, irrigation is only expected to raise the "A" limitation to Class 3

The remaining +/-9% (0.36 ha) of the Site, which has been mapped as AC Unit 3, occupies land in the southern area. This area has been rated at Class "AN" for anthropogenic alterations and is not considered to be available for agriculture due to the existence of a home, yard, driveway and outbuildings.

## **5.2 Comparison of BC Government and On-Site Inspection Ratings**

The unimproved and improved agricultural capability ratings applied to the Subject Properties based on the on-site inspection were somewhat consistent with the ratings ascribed by the MOE mapping, as summarized below (See also Tables 5 and 6; and Appendix A, Figure 9).

The on-site agricultural capability ratings revealed a greater extent of excess water limitation ("W") on the property although it was not as severe as depicted by the MOE mapping. As well, the published mapping showed that all areas of the Subject Property had an unimproved rating of 3A to 4A. By contrast, the on-site assessment identified persistent soil moisture deficiencies with an unimproved rating of 5A across the property. The improved ratings increased to Class 1 (northwest corner) to 3A (south and central area) with irrigation.

In summary, the on-site inspection agricultural capability ratings were somewhat consistent with both MOE climatic and overall agricultural capability ratings. There was a greater variability in the unimproved ratings mapped by the MoE, while the on-site inspection results were more homogeneous ascribing the same unimproved and improved ratings to 76% of the Subject Property. The homogeneity noted is likely due to the significant modification that has occurred to the surface soils across the site.



### **5.3 Feasibility of Improvements**

All improvements provided are theoretical in nature and based on best management practices as outlined the MOE Manual 1. These improvements are based on an assumption of land that is generally free of waste and contaminants. This assumed condition is not represented on the Subject Property.

The Subject Property has undergone historic improvements (see section 2.2.2). However, significant remaining rehabilitation is needed for the property to be suitable for agriculture (see section 2.2.3). The cost of the remaining improvements and rehabilitation that are necessary to prepare this property for agricultural use are not likely to be feasible. Furthermore, the required improvements (ie. Removal of wood waste material and replacement of the topsoil layer across 91% of the Subject Property) greatly exceed what would be considered "typical farm improvement practices", both in terms of the scope and costs for this work. The recovery of the improvement expenses by an agricultural production operation would be unlikely and is expected to be economically prohibitive.

The proposed future improvements based on MoE Manual 1 BMPs include supplemental moisture (irrigation) during the dry months and water control/drainage enhancements for excess moisture (ditching and/or artificial drainage). The results of this assessment suggest that these improvements would be feasible for AC Unit 1 and 2 which accounts for +/-91% (3.65 ha) of the Subject Property. The agricultural capability rating on AC 1 which accounts for +/-15% (0.59 ha) of the Subject Property is expected to improve from Class 5AW to Class 3WAD. The agricultural capability rating on AC 2 which accounts for +/-76% (3.06 ha) of the Subject Property is expected to improve from Class 5AW to Class 3WD. Improvements are not considered to be feasible for the remaining +/-6% (0.6 ha) of the Subject Property. This area is in AC Unit 3 which is unavailable due to existing residential structure and out buildings.



## 6 Agricultural Suitability

Agricultural suitability is related to agricultural capability, but involves the interpretation of a wider variety of factors as they relate to the potential for specific uses on a given property. While agricultural capability is based on physical features and measurable parameters, agricultural suitability assessments include a range of site conditions and external influences. The following factors were considered in assessing the agricultural suitability of the Subject Property:

- Feasibility of improvements;
- Availability of additional good quality topsoil;
- Overall size of the Subject Property;
- Location and context of the Subject Property (proximity to urban/suburban/rural land use and zoning);
- Land use on subject property – historical, current and future plans;
- Land use in surrounding area – historical, current and future plans;
- Diversifications, innovations and improvements to date;
- MoE agricultural capability ratings (at 1:20,000 mapping scale); and
- Agricultural capability ratings as determined by this assessment (at +/- 1:3,000 mapping scale).

The suitability of the Subject Property for various agricultural purposes has been evaluated in terms of the factors listed above and has been summarized in Table 7, below:



**TABLE 7: 982 Old Vernon Rd., Kelowna BC – Site Inspection: Agricultural Suitability**

AC Unit	Area (ha)	% Total Area	Ag Capability Unimproved (Improved)	Suitability for Agriculture Activities
<b>Soil Bound Agriculture</b>				
1&2	3.65	91%	Class 5 (Class 3)	These Agricultural Capability Units represent all of the property outside of the home site. The topsoil layer on this portion of the property has been completely admixed by the mill practices and would require significant remediation to be used for soil bound agriculture (section 2.2.3 for more detail). If rehabilitation was feasible, this area would potentially be suitable for perennial forage and select crops. The nearby Kelowna Airport, Environment Canada weather station data indicates that this area of Kelowna is a frost pocket which has on average 34 more days per year with minimum temperatures below 0C, when compared with East Kelowna and Kelowna weather stations. The risk of crop damage or failure may be increased due to the excess water and fewer frost free days. However, it would not be feasible to rehabilitate this area for soil bound agriculture due to the prohibitive costs of such improvements.
3	0.36	9%	NA	NA
<b>Intensive Soil Bound Livestock - Operations which depend, in whole, or in part, on growing their own feed for livestock production</b> (eg. Beef cattle (cow, calf or feeder), dairy cows, sheep, goats, and other livestock at a commercial scale)				
1&2	3.65	91%	Class 5 (Class 3)	These Agricultural Capability Units represent all of the property outside of the home site. The topsoil layer on this portion of the property has been completely admixed by the mill practices and would require significant remediation to be used for the production of livestock feed. If rehabilitation was feasible, this area would potentially be suitable for perennial forage. However, it would not be feasible to rehabilitate this area for livestock feed/production due to the prohibitive costs of such improvements.
3	0.36	9%	NA	NA
<b>Intensive Non-Soil Bound Livestock - Uses which do not rely on growing crops in soil to support the enterprise</b> (eg. Beef feedlots, hog production and poultry ie. Eggs and meat birds)				
1&2	3.65	91%	Class 5 (Class 3)	The property is located in a rural/residential area and near to a residential subdivision. Conflicts regarding the odours, noise and traffic associated with an intensive feedlot operation may be an issue with neighbouring rural residential property owners. For access reasons and potential conflict with neighbouring property owners this site is not suitable for intensive non-soil bound livestock. However, it would not be feasible to rehabilitate this area for non-soil bound livestock due to the prohibitive costs of such improvements.
3	0.36	9%	NA	NA
<b>Intensive Non-soil bound Horticultural Agriculture</b> (eg. green houses and container nursery)				
1&2	3.65	91%	Class 5 (Class 3)	The site is largely level. After remediation this property could be made suitable for Non-soil bound Horticultural Agriculture operation. However, it would not be feasible to rehabilitate this area for non-soil bound horticulture due to the prohibitive costs of such improvements.
3	0.36	9%	NA	NA



## 7 Impact Analysis

The potential impacts associated with the industrial land use on the Subject Property on the local and regional agricultural context have been summarized in Table 8, below. One of the advantages of having the Subject Property rehabilitated for industrial use would be the opportunity to install buffers between the site and surrounding properties that are being used for agricultural activities.

**TABLE 8: 982 Old Vernon Rd., Kelowna BC – Potential Impacts of Continuing Industrial Land Use**

Area of Concern	Anticipated Impacts from Proposed Land Use	Comments
Industrial Land Use of Subject Property on Surrounding Lands	The Subject Property was the site of a saw mill operation for over 50 years (35+ years since inclusion in the ALR). Further industrial land use would require extensive rehabilitation and improvements to the property. Such improvements can be expected to have a positive impact on the surrounding properties.	The Subject Property is located in a rural/residential area and is generally surrounded by agricultural properties with apparent light commercial/industrial uses on the neighbouring property to the east. There is a nearby small lot residential subdivision.
Regional and Local Agricultural Capacity	The Subject Property is not contributing to regional or local Agricultural Capacity. The property has not been used for agriculture since the 1950's. A non agricultural use on this property will not negatively impact the local Agricultural Capacity.	The site has not been used for agricultural purposes for over 50 years. There will be no impacts on local capacity if non-agricultural uses are permitted at this site.
Surrounding Agricultural Operations	Nearby agricultural operations include intensive soil bound agriculture to the north and south and hay fields to the west. A remediated industrial site including perimeter buffers would be an improvement for all neighbouring properties.	The property operated as an industrial site for about 50 years (35+ years since inclusion in the ALR) at this location. Clean up and redevelopment for further industrial use will require removal of unsightly and potentially deleterious wood waste and allow for the inclusion of buffers to be added to the site to ALC specifications. The buffering measures to be implemented will mitigate the negative impacts of future land uses on the neighbouring agricultural operations and properties.
Precedent of Industrial Land Use for Triggering Future Applications	The Subject Property shares commonalities with the neighbouring site to the east, as both were part of the original sawmill operation. The Subject Property was included in the ALR as an operating mill and operated for another 30 years at this location. Permitted non-farm land-use on the subject property may serve as a precedent for application on the property directly adjacent to the east (the remainder of the mill site). Beyond those sites there is no clear, likely precedent as all remaining surrounding lands are apparently used primarily for agriculture, or are not in the ALR	



## **8 Summary and Conclusions**

### **8.1 Subject Property**

The Subject Property has been used as a saw mill for over 50 years (35+ years since inclusion in the ALR). There has been no agricultural land use on the Subject Property in that time. Despite significant and costly rehabilitation efforts to the property, it remains in a state that is not suitable for agriculture. The estimated costs to complete the rehabilitation and make the Subject Property suitable for agricultural production are economically unfeasible when compared to the expected returns from an agricultural production business. In addition, such rehabilitation would fall well beyond the scope and cost of typical farm improvements.

Land use in the vicinity of the Subject Property is primarily rural / residential with agriculture being actively practised on the adjacent properties to the north, south and west of the property. The remainder of the original saw mill operation is located on the property directly adjacent to the east and is apparently being used for industrial activities, with no apparent agricultural use. While the majority of the property directly adjacent to the west is being used for hay, it is also being used to park heavy equipment. Across Old Vernon Rd. to the south is an agricultural property, approximately half of which is used to produce specialty market items (eg. Sauces, jams, pickled vegetables). The other half is not currently being used for any agricultural or industrial activities.

### **8.2 Soils and Agricultural Capability**

This assessment rated the soil moisture deficiencies at Class 5A (unimproved) for the entire Subject Property. The improved ratings for soil moisture on +/-91% of the Subject Property, based on the addition of irrigation, ranged from Class 3A to 1. The remaining 9% of the lot is unavailable for agricultural use. Variations in the soil moisture deficiency across the Subject Property were related to site-specific soil conditions (eg. soil texture) and anticipated responses to supplemental moisture;

This assessment rated undesirable soil structure at Class 3D for +/-91% of the Subject Property and was found to be a minor limitation on throughout the site. The remaining 9% of the lot is unavailable for agricultural use;

This assessment found that excess water was a limitation with a 4W (unimproved) rating on 91% of the Subject Property. The improved ratings for this portion of the property are 3W, based on ditching and/or installing artificial drainage to control the water in wetter months. The remaining 9% of the lot is unavailable for agricultural use;

The proposed improvements on the Subject Property included supplemental moisture (irrigation) during the dry months, as well as enhanced surface and soil profile drainage for the wet months. The results of this assessment suggest that these



improvements would be feasible for +/-91% (3.65 ha) of the Subject Property, where the agricultural capability ratings are expected to improve from Class 5 to Class 3;

The proposed improvements are not considered to be feasible for the remaining +/-9% (0.36 ha) of the Subject Property. This area is unavailable for agriculture due to existing residential structures and out buildings;

Under the current circumstances, and considering the cost and scope of required improvements for the Subject Property, no suitable agricultural uses have been identified for the Subject Property. The investments to date, combined with the high cost of removing wood waste and completing further assessments preclude the possibility of non-soil bound uses such as horticultural agricultural or an intensive livestock operation.

### **8.3 Proposed Project**

The landowners are exploring a variety of potential future land uses, including the possibility of returning to an industrial use on the Subject Property. A specific activity has not been designated at this time. However, due to the significant scope and onerous costs of site rehabilitation still required agricultural production is not considered to be a feasible option.

### **8.4 Conclusion**

The Subject Property is located in a rural/residential area of the City of Kelowna; it was operated historically as a saw mill until 2005, and has little to no current use on 91% of the property. While significant site rehabilitation and improvements could theoretically make the Subject Property suitable for agricultural production; the scope and costs of this work are well beyond what is generally considered to be typical farm improvement practices. Therefore, the rehabilitation of Subject Property for any agricultural purposes is not considered to be economically or practically feasible.

Generally speaking, inclusion of land that is improvable to class 3 into the ALR would be considered good practice; however, due to the historic industrial use of the Subject Property, rehabilitation of the Subject Property for agricultural use at the time of creation of the ALR (1974-1976) may already have well exceeded the potential returns from an agricultural operation. These conditions have been compounded to present day further limiting the land use options available to the current Landowners.



## 9 References

BC Ministry of Agriculture and Food and Ministry of Environment, April 1983. Land Capability for Agriculture in British Columbia. MOE Manual 1. Surveys and Resource Mapping Branch and Soils Branch: Kelowna, BC

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<http://www.kelowna.ca/CM/page2561.aspx>

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BC Ministry of Environment, 1975. Land Capability for Agriculture of the Okanagan and Similkameen Valleys, Mapsheet 82L.094t 1:20,000. Thematic Mapping Unit, Surveys and Resource Mapping Branch: Victoria, British Columbia

City of Kelowna, City of Kelowna Map Viewer (online),  
[http://www.kelowna.ca/website/ikelowna\\_map\\_viewer/viewer.cfm](http://www.kelowna.ca/website/ikelowna_map_viewer/viewer.cfm) , Kelowna, BC



## 10 Limitations

I, Matthew Davidson certify that I supervised and carried out the work as described in this report. The report is based upon and limited by circumstances and conditions referred to throughout the report and upon information available at the time of the site investigation. I have exercised reasonable skill, care and diligence to assess the information acquired during the preparation of this report. I believe this information is accurate but cannot guarantee or warrant its accuracy or completeness. Information provided by others was believed to be accurate but cannot be guaranteed.

The information presented in this report was acquired, compiled and interpreted exclusively for the purposes described in this report. I do not accept any responsibility for the use of this report, in whole or in part, for any purpose other than intended or to any third party for any use whatsoever. This report is valid for one year only after the date of production.

Respectfully Submitted,



Matthew Davidson, P.Ag.  
Senior Environmental Scientist  
Valhalla Environmental Consulting Inc.



### **Historic Land Use Additional Detail**

The Subject Property was included in the ALR when the reserve was established (1974-1976). Encroachment of mill operations in the form of wood waste occurred after 1976, as indicated by historic aerial photography. Know approved expansion of the mill operations onto the Subject Property occurred in 1985 and 2000.

The Subject Property has reportedly been previously used by Better Earth Products a composting company. The owner, at that time, of Better Earth (Del Kohnke) reported operating from 2008 to 2011 on the Subject Property. The initial operation by this individual and by extension, this company is referred to in section 2.2.1 of the report as a wood waste contractor, who was screening and trucking the waste to Tolko Industries in Armstrong for use in their cogeneration plant. Due to contamination issues with the wood waste (such as paint) Tolko would no longer receive the product so Mr. Kohnke explored compost opportunities for the remaining wood waste material with his existing composting business Better Earth. As some of the material had naturally composted it was initially sold directly to market, however with little success. Introduction of green nitrogen sources was applied but did not produce a saleable product. The operation of Better Earth on the Subject Property became economically prohibitive and was not viewed as a success by the owner (pers.comm. DK).



**Appendix A – Maps and Figures**  
**982 Old Vernon Rd., Kelowna, BC**



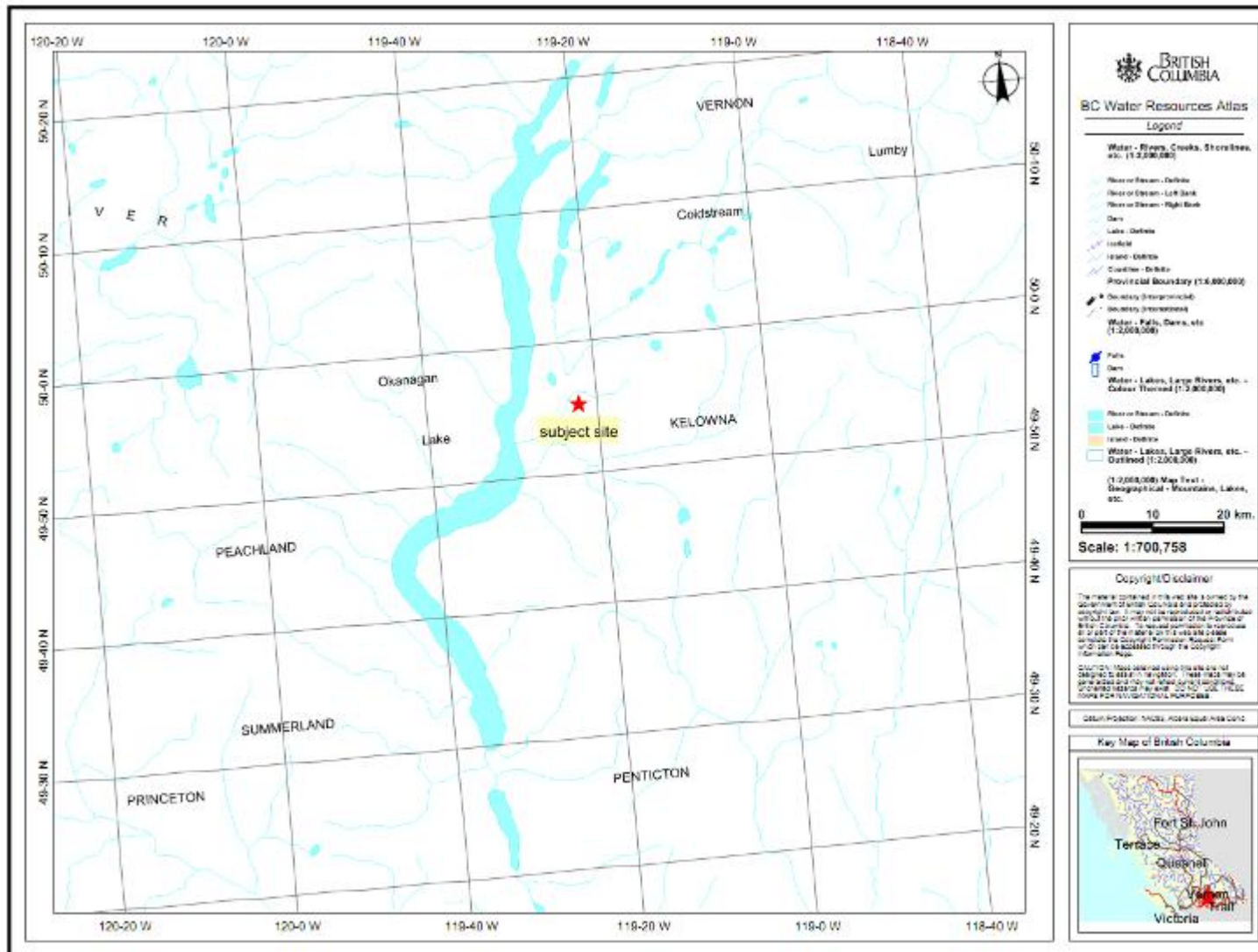


Figure 1: Regional Scale Location Map, 982 Old Vernon Rd., Kelowna BC (Not to scale for discussion purposes only)

Source: [http://www.env.gov.bc.ca/wsd/data\\_searches/wrbc/index.html](http://www.env.gov.bc.ca/wsd/data_searches/wrbc/index.html)





**Figure 2: Location Map, 982 Old Vernon Rd., Kelowna, BC**



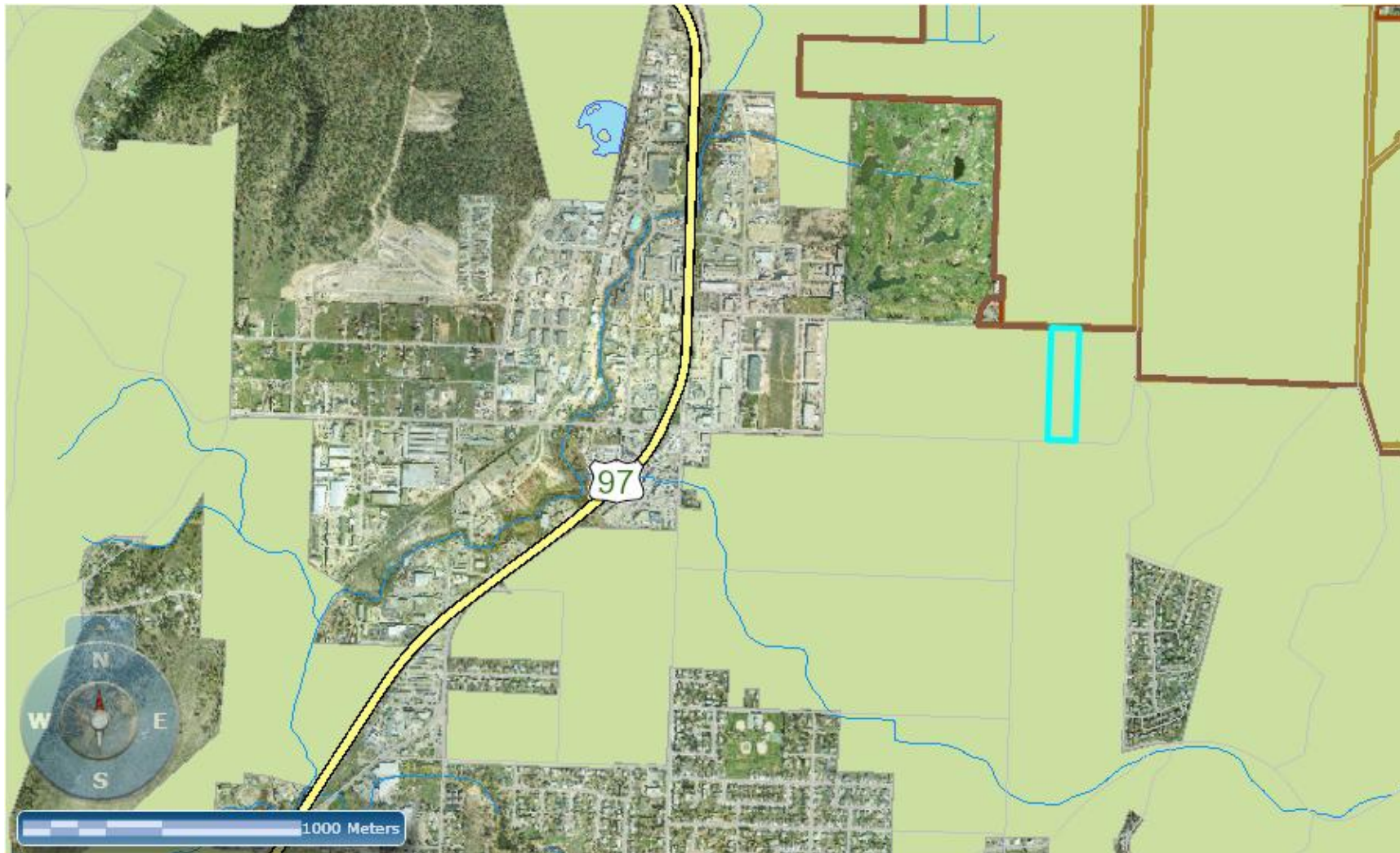


Figure 3: ALR, 982 Old Vernon Rd., Kelowna, BC

Source: RDCO Mapping - Accessed Nov. 15 2012  
[http://www.rdcogis.com/GIS\\_App/RDCO\\_GIS\\_App.html](http://www.rdcogis.com/GIS_App/RDCO_GIS_App.html)

site

ALR





**Figure 4: Contours, 982 Old Vernon Rd., Kelowna BC,  
 1m contour interval**

Source: City of Kelowna - Accessed Nov 15 2012  
[http://www.kelowna.ca/website/ikelowna\\_map\\_viewer/viewer.cfm](http://www.kelowna.ca/website/ikelowna_map_viewer/viewer.cfm)



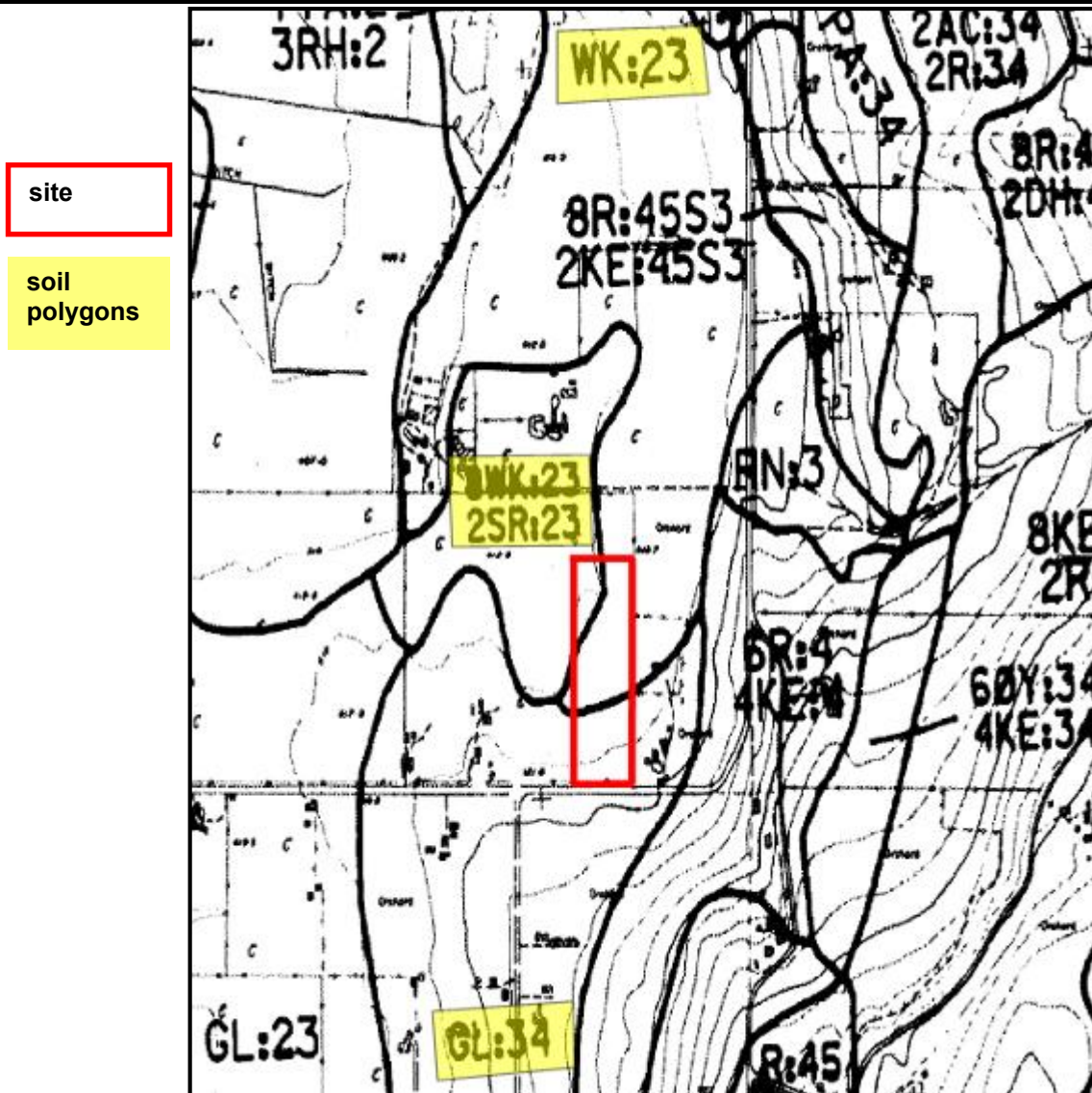
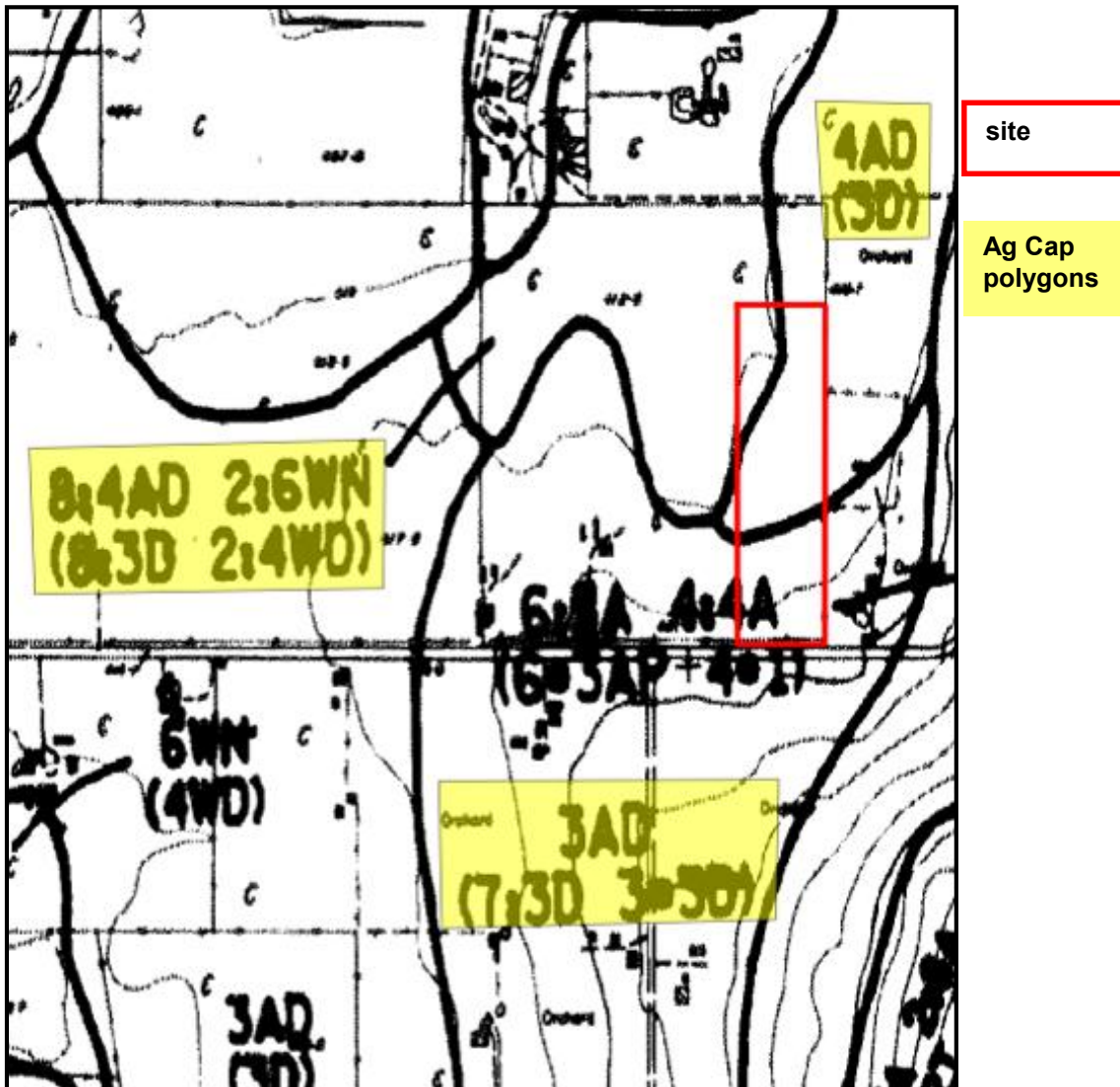


Figure 5: Soils Mapping, 982 Old Vernon Rd., Kelowna, BC,  
5m contour interval

Source: BC MOE; Soil Survey Report No. 52 (1982); Mapsheet 82E.094 @1:20,000  
(1987)

WK	WESTBANK	nearly level to strongly sloping stratified glaciolacustrine sediments	100 cm or more of clay, clay loam or silty clay	moderately well	Orthic Gray Luvisol
SR	SUNNERLAND	nearly level to strongly sloping fluvial veneer over glaciolacustrine sediments	10 to 100 cm of silty clay loam grading to clay loam	dominantly poor, ranging to imperfect; fluctuating groundwater table or seepage, subject to flooding	Orthic Humic Gleysol: calcareous and saline phases
GL	GLENMORE	nearly level to moderately sloping stratified glaciolacustrine sediments	100 cm or more of silt loam, silty clay loam or clay loam	well to moderately well	Eluviated Dark Brown





**Figure 6: Agricultural Capability Mapping, 982 Old Vernon Rd., Kelowna, BC**  
Source: BC MOE; Mapsheet 82E.094 @1:20,000 (1987)

**CAPABILITY CLASSIFICATIONS**

5AP - Unimproved Rating

(3AP) - Improved Rating

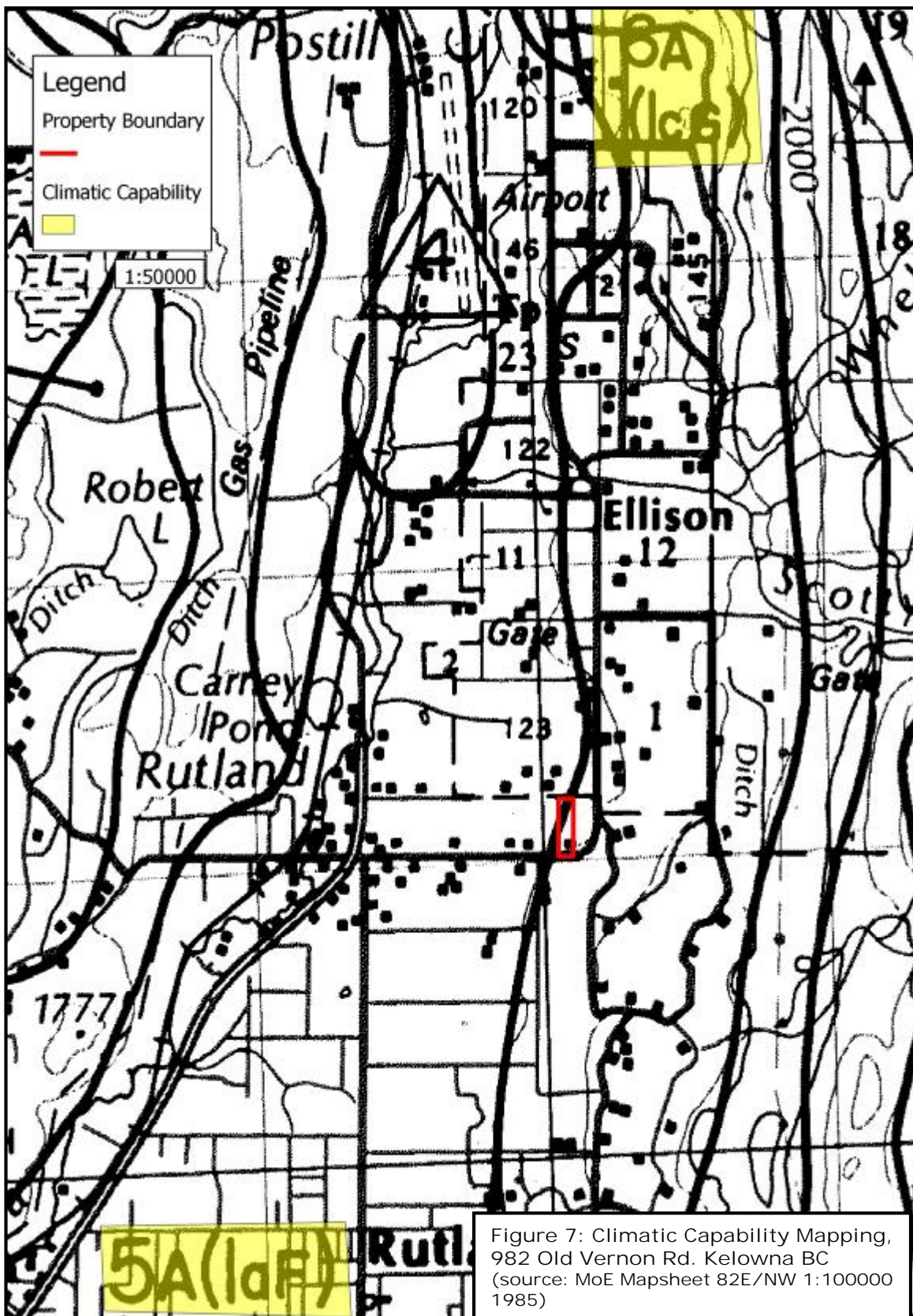
\*The asterisk is used with the Modified Land Capability Classification for Tree Fruits and Grapes.

It indicates the modified topography and/or stoniness classes have been used.

**CLASS RATINGS**

1. Land in this class either has no or only very slight limitations that restrict its use for the production of common agricultural crops.
2. Land in this class has minor limitations that require good ongoing management practices or slightly restrict the range of crops, or both.
3. Land in this class has limitations that require moderately intensive management practices or moderately restrict the range of crops, or both.
4. Land in this class has limitations that require special management practices or severely restrict the range of crops, or both.
5. Land in this class has limitations that restrict its capability to producing perennial forage crops or other specially adapted crops.
6. Land in this class is nonarable but is capable of producing native and/or uncultivated perennial forage crops.
7. Land in this class has no capability for arable culture or sustained natural grazing.







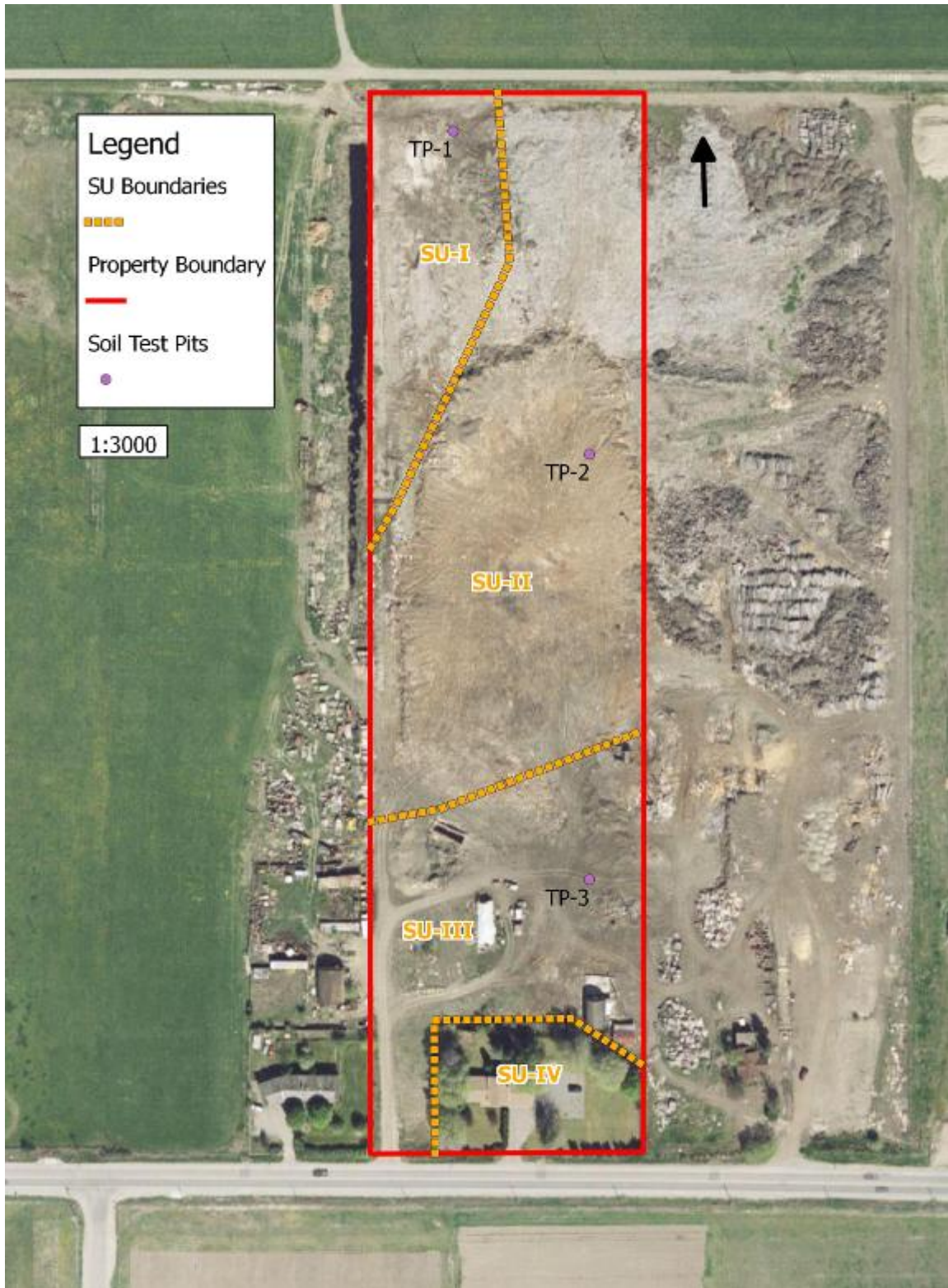


Figure 8: Soil Units and Test Pit Mapping, 982 Old Vernon Rd. Kelowna BC



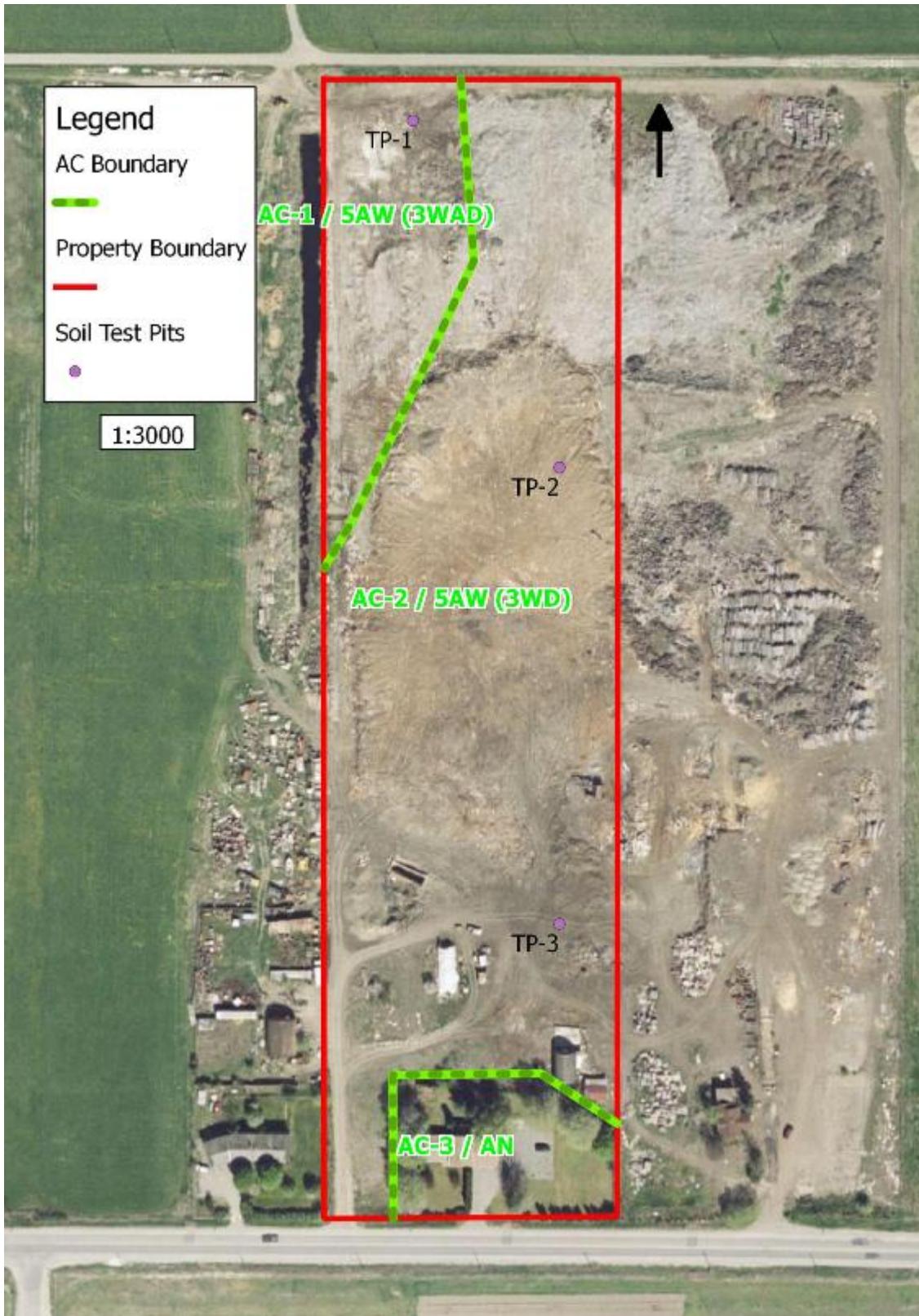


Figure 9: Agricultural Land Capability Mapping, 982 Old Vernon Rd., Kelowna BC



**Appendix B – Site & Soil Test Pit Photos  
982 Old Vernon Rd., Kelowna, BC**





Figure 9: 982 Old Vernon Rd. Kelowna BC – Soil Inspection, Soil test pit location map





Photo 1: South portion of the site showing remaining footprint of mill work, stored machinery, storage bins and home site in background



Photo 2: Central portion of the site showing wood waste on the ground, weedy cover and a wood waste pile in background





Photo 3: Northern portion of the site showing wood waste on the ground, weedy cover and wood waste piles in background



Project 12E043		TP #1	Slope N 1%		24-Oct-12	Overcast 2 C
Depth (cm)	Horizon	Texture	Consistence / Structure	Colour	Mottles	Coarse Fragments
2-0	LFH	-	thatch	-		
0-54	Fill	SL	admixed soil fill / WW	Dk Br	-	10% gravel*
54-70	B	C	firm / massive	DkGr	-	0% gravel
70+	C	HC	v. firm / blocky	Gr	-	0% gravel

Notes: All soil textures determined by laboratory testing, colour based on wet soils

Land Use – Former Mill

Gravel portion > 2.5 cm diameter

Vegetation grass and weeds

\*Coarse fragments are estimated visually

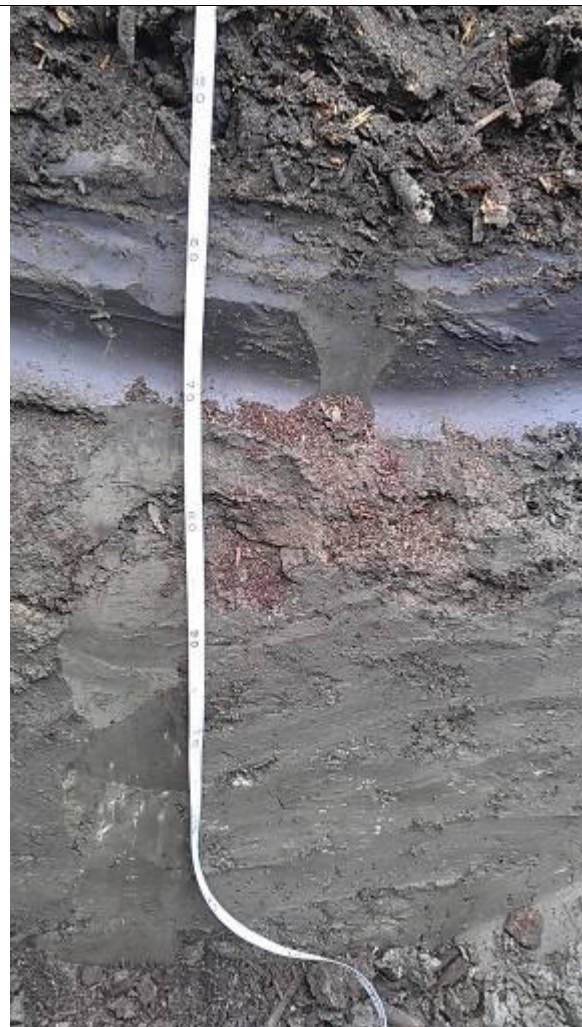
Poorly Drained Site

WW - Wood Waste



0cm to 90cm depth

Photo 4: Test Pit 1 – 982 Old Vernon Rd., Kelowna, BC



50cm to 130cm depth

Photo 5: Test Pit 1 – 982 Old Vernon Rd., Kelowna, BC



Project 12E043		TP #2	Slope NW 2%		24-Oct-12	Overcast 2 C
Depth (cm)	Horizon	Texture	Consistence / Structure	Colour	Mottles	Coarse Fragments
2-0	LFH	-	thatch	-		
0-15	Fill	C	admixed soil fill	Dk Br	-	10% gravel*
15-35	B	C	firm / massive	Gr Br	-	0% gravel
35+	C	HC	v. firm / blocky	Br	-	0% gravel

Notes: All soil textures determined by laboratory testing, colour based on wet soils

Land Use – Former Mill

Gravel portion > 2.5 cm diameter

Vegetation grass and weeds

\*Coarse fragments are estimated visually

Poorly Drained Site



0cm to 70cm depth

Photo 6: Test Pit 2 – 982 Old Vernon Rd., Kelowna, BC



50cm to 130cm depth

Photo 7: Test Pit 2 – 982 Old Vernon Rd., Kelowna, BC



Project 12E043		TP #3	Slope NW 1%		24-Oct-12	Overcast 2C
Depth (cm)	Horizon	Texture	Consistence / Structure	Colour	Mottles	Coarse Fragments
0-35	Fill	L	add mixed fill / WW	Br	-	10% gravel*
35-55	B	HC	v. firm / massive	DkGr	-	0% gravel*
55+	C	HC	v. firm / subangular blocky	Gr	-	0% gravel*

Notes: All soil textures determined by laboratory testing, colour determined with wet soil

Land Use – Former Mill

Gravel portion > 2.5 cm diameter

Vegetation grass and weeds

\* Coarse fragments are estimated visually

Poorly Drained Site

WW - Wood Waste



0cm to 55cm depth

50cm to 130cm depth

Photo 8: Test Pit 3 – 982 Old Vernon Rd., Kelowna, BC

Photo 9: Test Pit 3 – 982 Old Vernon Rd., Kelowna, BC



## **Appendix C – Agricultural and Climatic Capability Class Descriptions**



## LAND CAPABILITY CLASSES FOR MINERAL SOILS

**CLASS 1:** LAND IN THIS CLASS EITHER HAS NO OR ONLY VERY SLIGHT LIMITATIONS THAT RESTRICT ITS USE FOR THE PRODUCTION OF COMMON AGRICULTURAL CROPS.

Land in Class 1 is level or nearly level. The soils are deep, well to imperfectly drained under natural conditions, or have good artificial water table control, and hold moisture well. They can be managed and cropped without difficulty. Productivity is easily maintained for a wide range of field crops.

**CLASS 2 :** LAND IN THIS CLASS HAS MINOR LIMITATIONS THAT REQUIRE GOOD ONGOING MANAGEMENT PRACTISES OR SLIGHTLY RESTRICT THE RANGE OF CROPS, OR BOTH.

Land in class 2 has limitations which constitute a continuous minor management problem or may cause lower crop yields compared to Class 1 land but which does not pose a threat of crop loss under good management. The soils in Class 2 are deep, hold moisture well and can be managed and cropped with little difficulty.

**CLASS 3:** LAND IN THIS CLASS HAS LIMITATIONS THAT REQUIRE MODERATELY INTENSIVE MANAGEMENT PRACTISES OR MODERATELY RESTRICT THE RANGE OF CROPS, OR BOTH.

The limitations are more severe than for Class 2 land and management practises are more difficult to apply and maintain. The limitations may restrict the choice of suitable crops or affect one or more of the following practises: timing and ease of tillage, planting and harvesting, and methods of soil conservation.

**CLASS 4:** LAND IN THIS CLASS HAS LIMITATIONS THAT REQUIRE SPECIAL MANAGEMENT PRACTISES OR SEVERELY RESTRICT THE RANGE OF CROPS, OR BOTH.

Land in Class 4 has limitations which make it suitable for only a few crops, or the yield for a wide range of crops is low, or the risk of crop failure is high, or soil conditions are such that special development and management practises are required. The limitations may seriously affect one or more of the following practises: timing and ease of tillage, planting and harvesting, and methods of soil conservation.

**CLASS 5:** LAND IN THIS CLASS HAS LIMITATIONS THAT RESTRICT ITS CAPABILITY TO PRODUCING PERENNIAL FORAGE CROPS OR OTHER SPECIALLY ADAPTED CROPS.

Land in Class 5 is generally limited to the production of perennial crops or other specially adapted crops. Productivity of these suited crops may be high. Class 5 lands can be cultivated and some may be used for cultivated field crops provided unusually intensive management is employed and/or the crop is particularly adapted to the conditions peculiar to these lands. Cultivated field crops may be grown on some Class 5 land where adverse climate is the main limitation, but crop failure can be expected under average conditions. Note that in areas which are climatically suitable for growing tree fruits and grapes the limitations of stoniness and/or topography on some Class 5 lands are not significant limitations to these crops.

**CLASS 6:** LAND IN THIS CLASS IS NONARABLE BUT IS CAPABLE OF PRODUCING NATIVE AND OR UNCULTIVATED PERENNIAL FORAGE CROPS.



Land in Class 6 provides sustained natural grazing for domestic livestock and is not arable in its present condition. Land is placed in this class because of severe climate, or the terrain is unsuitable for cultivation or use of farm machinery, or the soils do not respond to intensive improvement practises. Some unimproved Class 6 lands can be improved by draining and/or diking.

CLASS 7: LAND IN THIS CLASS HAS NO CAPABILITY FOR ARABLE OR SUSTAINED NATURAL GRAZING.

All classified areas not included in Classes 1 to 6 inclusive are placed in this class. Class 7 land may have limitations equivalent to Class 6 land but they do not provide natural sustained grazing by domestic livestock due to climate and resulting unsuitable natural vegetation. Also included are rockland, other nonsoil areas, and small water-bodies not shown on maps. Some unimproved Class 7 land can be improved by draining or diking.

Source: ALC [http://www.alc.gov.bc.ca/alr/ag\\_cap\\_details.htm](http://www.alc.gov.bc.ca/alr/ag_cap_details.htm), Accessed December 2012



**Appendix D – Analytical Data**  
**982 Old Vernon Rd., Kelowna BC**



## Report Transmission Cover Page

Bill To: Manraj Kandola	Project:	Lot ID: <b>902099</b>
Report To: Manraj Kandola	ID: 12 E043	Control Number: 196-1001
982 Old Vernon Road	Name: Kandola- Ag Cap	Date Received: Oct 26, 2012
Kelowna, BC, Canada	Location: Kelowna	Date Reported: Nov 22, 2012
V1X 6T8	LSD:	Report Number: 1785767
Attn: Manraj Kandola	P.O.:	
Sampled By: MD	Acct code:	
Company: Valhalla		

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Contact & Affiliation	Address	Delivery Commitments
Matt Davidson Valhalla Environmental	2503 35th Avenue Vernon, British Columbia V1T 2S6 Phone: (250) 275-1471 Fax: (866) 485-1471 Email: matt@valhallaconsulting.ca	On [Report Approval] send (Test Report) by Email - Single Report
Manraj Kandola Manraj Kandola	982 Old Vernon Road Kelowna, British Columbia V1X 6T8 Phone: (250) 765-0619 Fax: null Email: manrajandola@hotmail.com	On [Report Approval] send (Test Report) by Email - Single Report On [Report Approval] send (Test Report) by Email - Single Report On [Lot Approval and Final Test Report Approval] send (Invoice) by Email - Single Report On [Lot Approval and Final Test Report Approval] send (Invoice) by Email - Single Report

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### Notes To Clients:

- Insufficient sample volume to complete dry sieve analysis on sample 902099-1.
- Report was re-issued to include missing dry sieve analysis on samples 902099-2 to 8. Report 1785767 replaces original report 1779561.



**Sample Custody**

Bill To: Manraj Kandola	Project:	Lot ID: <b>902099</b>
Report To: Manraj Kandola	ID: 12 E043	Control Number: 196-1001
982 Old Vernon Road	Name: Kandola- Ag Cap	Date Received: Oct 26, 2012
Kelowna, BC, Canada	Location: Kelowna	Date Reported: Nov 22, 2012
V1X 6T8	LSD:	Report Number: 1785767
Attn: Manraj Kandola	P.O.:	
Sampled By: MD	Acct code:	
Company: Valhalla		

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**Sample Disposal Date: December 05, 2012**

All samples will be stored until this date unless other instructions are received. Please indicate other requirements below and return this form to the address or fax number on the top of this page.

Extend Sample Storage Until \_\_\_\_\_ (MM/DD/YY)

The following charges apply to extended sample storage:

Storage for an additional 30 days	\$ 2.50 per sample
Storage for an additional 60 days	\$ 5.00 per sample
Storage for an additional 90 days	\$ 7.50 per sample

Return Sample, collect, to the address below via:

Greyhound

DHL

Purolator

Other (specify) \_\_\_\_\_

Name \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

Phone \_\_\_\_\_

Fax \_\_\_\_\_

Signature \_\_\_\_\_



## Analytical Report

Bill To: Manraj Kandola	Project:	Lot ID: <b>902099</b>
Report To: Manraj Kandola	ID: 12 E043	Control Number: 196-1001
982 Old Vernon Road	Name: Kandola- Ag Cap	Date Received: Oct 26, 2012
Kelowna, BC, Canada	Location: Kelowna	Date Reported: Nov 22, 2012
V1X 6T8	LSD:	Report Number: 1785767
Attn: Manraj Kandola	P.O.:	
Sampled By: MD	Acct code:	
Company: Valhalla		

**Reference Number** 902099-1  
**Sample Date** Oct 24, 2012  
**Sample Time** NA  
**Sample Location**  
**Sample Description** TP1 / TP1-01 / 30cm  
**Matrix** Soil

Analyte	Units	Results	Results	Results	Nominal Detection Limit
<b>Available Nutrients</b>					
Nitrate - N	Available ug/g	3			2
Phosphorus	Available ug/g	8			5
Potassium	Available ug/g	492			25
Sulfate-S	Available mg/kg	<10			1
Calcium	Available mg/kg	4580			30
Magnesium	Available mg/kg	990			5
Sodium	Available mg/kg	520			30
Ammonium - N	Available-dry basis ug/g	122			0.3
<b>Soil Acidity</b>					
pH	1:2 Soil:Water	pH	6.2		
Electrical Conductivity	Sat. Paste equiv based on 1:2	dS/m at 25 C	0.54		0.02
Electrical Conductivity	1:2 Soil:Water	dS/m at 25 C	0.26		0.01



## Analytical Report

Bill To: Manraj Kandola	Project:	Lot ID: <b>902099</b>
Report To: Manraj Kandola	ID: 12 E043	Control Number: 196-1001
982 Old Vernon Road	Name: Kandola- Ag Cap	Date Received: Oct 26, 2012
Kelowna, BC, Canada	Location: Kelowna	Date Reported: Nov 22, 2012
V1X 6T8	LSD:	Report Number: 1785767
Attn: Manraj Kandola	P.O.:	
Sampled By: MD	Acct code:	
Company: Valhalla		

	Reference Number	902099-1	902099-2	902099-3		
	Sample Date	Oct 24, 2012	Oct 24, 2012	Oct 24, 2012		
	Sample Time	NA	NA	NA		
	Sample Location					
	Sample Description	TP1 / TP1-01 / 30cm	TP1 / TP1-02 / 60cm	TP1 / TP1-03 / 100cm		
	Matrix	Soil	Soil	Soil		
Analyte	Units	Results	Results	Results	Nominal Detection Limit	
<b>Physical and Aggregate Properties</b>						
Moisture at 1/3 bar	%	35.6	38.8	36.8	0.1	
Moisture at 15 bar	%	28.1	23.3	23.1	0.1	
Texture		Sandy Loam	Clay	Heavy Clay		
Sand	50 µm - 2 mm	% by weight	62.7	19.6	7.6	0.1
Silt	2 µm - 50 µm	% by weight	27.3	33.4	15.4	0.1
Clay	<2 µm	% by weight	10.0	47.0	77.0	0.1



## Analytical Report

Bill To: Manraj Kandola	Project:	Lot ID: <b>902099</b>
Report To: Manraj Kandola	ID: 12 E043	Control Number: 196-1001
982 Old Vernon Road	Name: Kandola- Ag Cap	Date Received: Oct 26, 2012
Kelowna, BC, Canada	Location: Kelowna	Date Reported: Nov 22, 2012
V1X 6T8	LSD:	Report Number: 1785767
Attn: Manraj Kandola	P.O.:	
Sampled By: MD	Acct code:	
Company: Valhalla		

	Reference Number	902099-2	902099-3	902099-4		
	Sample Date	Oct 24, 2012	Oct 24, 2012	Oct 24, 2012		
	Sample Time	NA	NA	NA		
	Sample Location					
	Sample Description	TP1 / TP1-02 / 60cm	TP1 / TP1-03 / 100cm	TP2 / TP2-01 / 15cm		
	Matrix	Soil	Soil	Soil		
Analyte	Units	Results	Results	Results	Nominal Detection Limit	
<b>Particle Size Analysis - Dry Sieve</b>						
2.0 mm sieve	% Retained	% by weight	1.2	0.2	10.6	0.1
500 micron sieve	% Retained	% by weight	0.9	0.7	9.8	0.1
250 micron sieve	% Retained	% by weight	1.1	0.8	3.7	0.1
53 micron sieve	% Retained	% by weight	12.0	1.4	10.0	0.1



## Analytical Report

Bill To: Manraj Kandola  
 Report To: Manraj Kandola  
 982 Old Vernon Road  
 Kelowna, BC, Canada  
 V1X 6T8  
 Attn: Manraj Kandola  
 Sampled By: MD  
 Company: Valhalla

Project:  
 ID: 12 E043  
 Name: Kandola- Ag Cap  
 Location: Kelowna  
 LSD:  
 P.O.:  
 Acct code:

Lot ID: **902099**  
 Control Number: 196-1001  
 Date Received: Oct 26, 2012  
 Date Reported: Nov 22, 2012  
 Report Number: 1785767

	Reference Number	902099-4	902099-5	902099-6	
	Sample Date	Oct 24, 2012	Oct 24, 2012	Oct 24, 2012	
	Sample Time	NA	NA	NA	
	Sample Location				
	Sample Description	TP2 / TP2-01 / 15cm	TP2 / TP2-02 / 30cm	TP3 / TP3-01 / 20cm	
	Matrix	Soil	Soil	Soil	
Analyte	Units	Results	Results	Results	Nominal Detection Limit
<b>Physical and Aggregate Properties</b>					
Moisture at 1/3 bar	%	50.4	40.7	57.7	0.1
Moisture at 15 bar	%	28.2	27.4	37.8	0.1
Texture		Clay	Clay	Loam	
Sand	50 µm - 2 mm	% by weight	25.6	15.2	44.3
Silt	2 µm - 50 µm	% by weight	27.0	27.8	30.7
Clay	<2 µm	% by weight	47.4	57.0	25.0



## Analytical Report

Bill To: Manraj Kandola	Project:	Lot ID: <b>902099</b>
Report To: Manraj Kandola	ID: 12 E043	Control Number: 196-1001
982 Old Vernon Road	Name: Kandola- Ag Cap	Date Received: Oct 26, 2012
Kelowna, BC, Canada	Location: Kelowna	Date Reported: Nov 22, 2012
V1X 6T8	LSD:	Report Number: 1785767
Attn: Manraj Kandola	P.O.:	
Sampled By: MD	Acct code:	
Company: Valhalla		

	Reference Number	902099-5	902099-6	902099-7		
	Sample Date	Oct 24, 2012	Oct 24, 2012	Oct 24, 2012		
	Sample Time	NA	NA	NA		
	Sample Location					
	Sample Description	TP2 / TP2-02 / 30cm	TP3 / TP3-01 / 20cm	TP3 / TP3-02 / 45cm		
	Matrix	Soil	Soil	Soil		
Analyte	Units	Results	Results	Results	Nominal Detection Limit	
<b>Particle Size Analysis - Dry Sieve</b>						
2.0 mm sieve	% Retained	% by weight	0.1	20.8	0.3	0.1
500 micron sieve	% Retained	% by weight	0.5	16.4	0.7	0.1
250 micron sieve	% Retained	% by weight	0.4	8.0	0.7	0.1
53 micron sieve	% Retained	% by weight	3.9	12.8	5.2	0.1



## Analytical Report

Bill To: Manraj Kandola	Project:	Lot ID: <b>902099</b>
Report To: Manraj Kandola	ID: 12 E043	Control Number: 196-1001
982 Old Vernon Road	Name: Kandola- Ag Cap	Date Received: Oct 26, 2012
Kelowna, BC, Canada	Location: Kelowna	Date Reported: Nov 22, 2012
V1X 6T8	LSD:	Report Number: 1785767
Attn: Manraj Kandola	P.O.:	
Sampled By: MD	Acct code:	
Company: Valhalla		

Reference Number	902099-7	902099-8
Sample Date	Oct 24, 2012	Oct 24, 2012
Sample Time	NA	NA
Sample Location		
Sample Description	TP3 / TP3-02 / 45cm	TP3 / TP3-03 / 100cm
Matrix	Soil	Soil

Analyte	Units	Results	Results	Results	Nominal Detection Limit
<b>Physical and Aggregate Properties</b>					
Moisture at 1/3 bar	%	38.7	43.7		0.1
Moisture at 15 bar	%	23.9	25.3		0.1
Texture		Heavy Clay	Heavy Clay		
Sand	50 µm - 2 mm	% by weight	15.6	8.6	0.1
Silt	2 µm - 50 µm	% by weight	19.4	9.4	0.1
Clay	<2 µm	% by weight	65.0	82.0	0.1



## Analytical Report

Bill To: Manraj Kandola  
Report To: Manraj Kandola  
982 Old Vernon Road  
Kelowna, BC, Canada  
V1X 6T8  
Attn: Manraj Kandola  
Sampled By: MD  
Company: Valhalla

Project:  
ID: 12 E043  
Name: Kandola- Ag Cap  
Location: Kelowna  
LSD:  
P.O.:  
Acct code:

Lot ID: **902099**  
Control Number: 196-1001  
Date Received: Oct 26, 2012  
Date Reported: Nov 22, 2012  
Report Number: 1785767

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**Reference Number** 902099-8  
**Sample Date** Oct 24, 2012  
**Sample Time** NA  
**Sample Location**  
**Sample Description** TP3 / TP3-03 /  
100cm  
**Matrix** Soil

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Analyte	Units	Results	Results	Results	Nominal Detection Limit
<b>Particle Size Analysis - Dry Sieve</b>					
2.0 mm sieve	% Retained	% by weight	<0.1		0.1
500 micron sieve	% Retained	% by weight	0.2		0.1
250 micron sieve	% Retained	% by weight	0.2		0.1
53 micron sieve	% Retained	% by weight	0.6		0.1

Approved by:   
Mathieu Simoneau  
Operations Manager



## Quality Control

Bill To: Manraj Kandola	Project:	Lot ID: <b>902099</b>
Report To: Manraj Kandola	ID: 12 E043	Control Number: 196-1001
982 Old Vernon Road	Name: Kandola- Ag Cap	Date Received: Oct 26, 2012
Kelowna, BC, Canada	Location: Kelowna	Date Reported: Nov 22, 2012
V1X 6T8	LSD:	Report Number: 1785767
Attn: Manraj Kandola	P.O.:	
Sampled By: MD	Acct code:	
Company: Valhalla		

## Available Nutrients

Blanks	Units	Measured	Lower Limit	Upper Limit	Passed QC
Ammonium - N	mg/L	0.035	-0.3	0.3	yes
Nitrate - N	mg/L	0.149	-1	1	yes
Phosphorus	mg/L	0.289	-4	5	yes
Potassium	mg/L	0.074	-3	10	yes
Sulfate-S	mg/L	0.1064	0	1	yes
Calcium	mg/L	1.029	-1	3	yes
Magnesium	mg/L	0.1713	-0	0	yes
Sodium	mg/L	0.8753	-0	2	yes

Date Acquired: October 29, 2012

Replicates	Units	Replicate 1	Replicate 2	% RSD Criteria	Absolute Criteria	Passed QC
Ammonium - N	ug/g	826	854	10	0.6	yes
Nitrate - N	ug/g	36	37	10	2	yes
Phosphorus	ug/g	80	80	10	5	yes
Potassium	ug/g	1620	1550	10	10	yes

Date Acquired: October 29, 2012

Control Sample	Units	Measured	Lower Limit	Upper Limit	Passed QC
Ammonium - N	ug/g	8.3	6.3	9.5	yes
Nitrate - N	ug/g	42	33	47	yes
Phosphorus	ug/g	16	12	18	yes
Potassium	ug/g	280	234	288	yes
Sulfate-S	mg/kg	644	560	806	yes
Calcium	mg/kg	7440	6135	8301	yes
Magnesium	mg/kg	648	550	744	yes
Sodium	mg/kg	80	61	99	yes

Date Acquired: October 29, 2012

Ammonium - N	ug/g	4.0	3.6	4.2	yes
Nitrate - N	ug/g	4	3	5	yes
Phosphorus	ug/g	3	2	4	yes
Potassium	ug/g	31	24	36	yes
Sulfate-S	mg/kg	1	1	1	yes
Calcium	mg/kg	10	9	11	yes
Magnesium	mg/kg	10	9	11	yes
Sodium	mg/kg	10	9	11	yes

Date Acquired: October 29, 2012

## Physical and Aggregate Properties

Replicates	Units	Replicate 1	Replicate 2	% RSD Criteria	Absolute Criteria	Passed QC
Moisture	%	13.2	12.8	10	0.3	yes

Date Acquired: November 05, 2012



## Quality Control

Bill To: Manraj Kandola	Project:	Lot ID: <b>902099</b>
Report To: Manraj Kandola	ID: 12 E043	Control Number: 196-1001
982 Old Vernon Road	Name: Kandola- Ag Cap	Date Received: Oct 26, 2012
Kelowna, BC, Canada	Location: Kelowna	Date Reported: Nov 22, 2012
V1X 6T8	LSD:	Report Number: 1785767
Attn: Manraj Kandola	P.O.:	
Sampled By: MD	Acct code:	
Company: Valhalla		

## Physical and Aggregate Properties -

### Continued

Control Sample	Units	Measured	Lower Limit	Upper Limit	Passed QC
Moisture at 1/3 bar	%	27.2	20.5	32.5	yes
Moisture at 15 bar	%	15.5	11.0	23.0	yes
Date Acquired: October 29, 2012					
Moisture at 1/3 bar	%	38.3	0.0	0.0	yes
Moisture at 15 bar	%	36.9	0.0	0.0	yes
Sand	% by weight	39.6	35.8	45.4	yes
Silt	% by weight	41.0	31.0	43.6	yes
Clay	% by weight	19.4	15.6	28.8	yes
<50 um	% by weight	60.4	54.700	64.300	yes
Date Acquired: October 29, 2012					

## Particle Size Analysis - Dry Sieve

Control Sample	Units	Measured	Lower Limit	Upper Limit	Passed QC
2.0 mm sieve	% by weight	0.1	0.0	0.0	yes
500 micron sieve	% by weight	3.9	0.0	0.0	yes
250 micron sieve	% by weight	7.6	0.0	0.0	yes
53 micron sieve	% by weight	28.2	0.0	0.0	yes
Date Acquired: November 16, 2012					
2.0 mm sieve	% by weight	0.1	0.0	0.0	yes
500 micron sieve	% by weight	3.0	0.0	0.0	yes
250 micron sieve	% by weight	7.4	0.0	0.0	yes
53 micron sieve	% by weight	23.3	0.0	0.0	yes
Date Acquired: November 16, 2012					

## Soil Acidity

Blanks	Units	Measured	Lower Limit	Upper Limit	Passed QC
pH	pH	6	5.3	7.2	yes
Electrical Conductivity	dS/m at 25 C	0.005	-0.00	0.01	yes
Date Acquired: October 30, 2012					
Control Sample	Units	Measured	Lower Limit	Upper Limit	Passed QC
pH	pH	7.3	7.0	7.4	yes
Electrical Conductivity	dS/m at 25 C	1.30	1.15	2.05	yes
Date Acquired: October 30, 2012					



## Methodology and Notes

Bill To: Manraj Kandola	Project:	Lot ID: <b>902099</b>
Report To: Manraj Kandola	ID: 12 E043	Control Number: 196-1001
982 Old Vernon Road	Name: Kandola- Ag Cap	Date Received: Oct 26, 2012
Kelowna, BC, Canada	Location: Kelowna	Date Reported: Nov 22, 2012
V1X 6T8	LSD:	Report Number: 1785767
Attn: Manraj Kandola	P.O.:	
Sampled By: MD	Acct code:	
Company: Valhalla		

## Method of Analysis

Method Name	Reference	Method	Date Analysis Started	Location
Ammonium-N (Extractable) in Soil	Carter	* Extraction of NO <sub>3</sub> -N and NH <sub>4</sub> -N with 2.0 M KCl, 6.2	29-Oct-12	Exova Edmonton
Macronutrients in General Soils	McKeague	* Ammonium Acetate Extractable Cations, 4.51	29-Oct-12	Exova Edmonton
Nutrients in General Soil	Comm. Soil Sci. Pl. Anal.	* Modified Kelowna Soil Test, Vol 26, 1995	29-Oct-12	Exova Edmonton
Particle Size Analysis - GS	Carter	* Hydrometer Method, 55.3	29-Oct-12	Exova Edmonton
Particle Size by Dry Sieve	Carter	* Sieve Analysis (Mechanical Method), 55.4	16-Nov-12	Exova Edmonton
pH and Conductivity in general soil 1:2	McKeague	* 1:2 Soil:Water Ratio, 4.12	29-Oct-12	Exova Edmonton
Sulfate in General Soil	McKeague	* Sulfate Extractable by 0.1M CaCl <sub>2</sub> , 4.47	29-Oct-12	Exova Edmonton
Water Retention Curves	Agronomy No 9, Part 1	* Water Retention: Laboratory Methods, 26-6	29-Oct-12	Exova Edmonton

\* Reference Method Modified

## References

Agronomy No 9, Part	Methods of Soil Analysis, Part 1
Carter	Soil Sampling and Methods of Analysis.
Comm. Soil Sci. Pl.	Communications in Soil Science and Plant Analysis
McKeague	Manual on Soil Sampling and Methods of Analysis

## Comments:

- Insufficient sample volume to complete dry sieve analysis on sample 902099-1.
- Report was re-issued to include missing dry sieve analysis on samples 902099-2 to 8. Report 1785767 replaces original report 1779561.

Please direct any inquiries regarding this report to our Client Services group.  
 Results relate only to samples as submitted.

The test report shall not be reproduced except in full, without the written approval of the laboratory.



## Appendix E – Resumes



Matthew Davidson BSc., P.Ag., EP., ASCT. – Environmental Scientist

Matthew Davidson is an Environmental Scientist with a background in environmental biology, environmental assessment, land services and contaminated sites. With a diverse work history Matthew has worked for clients in various sectors including oil and gas, forestry, agriculture, land development, construction, recycling, and waste management industries. Project work has taken Matthew throughout British Columbia, into Alberta and the North West Territories. Matthew is a founding partner of Sage Environmental Consulting Ltd and is presently a Partner at Valhalla Environmental Consulting Inc. Coldstream, BC

Environmental Work Experience (11 Years)

<b>Partner / Environmental Scientist</b> Valhalla Environmental Consulting Ltd, Coldstream, BC	July 2011
<b>Owner / Environmental Scientist</b> Sage Environmental Consulting Ltd, Vernon, BC	January 2008
<b>Environmental Scientist</b> TerraWest Environmental Consultants Ltd., Victoria, BC	August 2005
<b>Field Foreman</b> Alpine Environmental Ltd. Fort St. John, BC	May 2001

Education

<b>BSc. Environmental Science</b> , Royal Roads University	2005
<b>Dipl.Tech. Environmental Science</b> , Camosun College	2002
<b>A.S. Biology</b> , Camosun College	1999

Professional Associations

- P.Ag.** - British Columbia Institute of Agrologists (**BCIA**)
- ASCT.** - Applied Science Technologists and Technicians of British Columbia (**ASTTBC**)
- E.P.** - Environmental Professional (Eco Canada)
  - A5 - Restoration & Reclamation
  - A7 - Environmental Protection Management
- SER** - Member of the Society for Ecological Restoration

Environmental Work Summary

- Stage 1 & 2 preliminary site investigations (PSI), Detailed Site Investigations (DSI) & Land Remediation
- Ecological Restoration Project Design and Management
- Environmental Impact Assessments
- Riparian Areas Assessments
- Environmental Monitoring for Construction Projects and Instream Works
- Erosion and Sediment Control Design, Implementation and Monitoring
- Spill response, and remediation of terrestrial and aquatic spills
- Policy writing & application package preparation
- Facility audit design and implementation for environmental compliance and performance
- Environmental Sampling Program Design and Implementation
- Instructor for Malaspina College; WHMIS, TDG, Spill Response and Environmental Awareness courses
- Site assessments and inspections for pipelines right of way and oil and gas well sites
- Industrial waste management, for the upstream Oil & Gas Industry
- Agricultural Land Capability Assessments (ALR)
- Habitat Assessment and Mapping
- Groundwater / Water Quality Monitoring Design and Implementation



## Select Project Portfolio

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**Construction Environmental Monitoring - BC 2012** - Services included environmental monitoring for two bridge construction projects over fish bearing streams in BC's southern interior. Daily logging and summary reporting were provided to the client and Ministry of Forests Lands and Natural Resource Operations.

**Environmentally Sensitive Areas Assessment and Terrestrial Habitat Mapping - Vernon BC 2011/2012** - Provided habitat mapping of the Foothills Neighbourhood in Vernon BC to inform the City of Vernon neighbourhood plan development. Services included review of existing TEM and SEI 1:20000 mapping, confirmation field visits to updated and correct existing mapping to current conditions, creation of site specific 1:3000 habitat mapping, invasive species survey, rare and endangered species survey, and reporting.

**Spill Remediation Confirmation Analysis - West Kootenay BC 2011/2012** - Scope of services induced; sampling plan design to meet MoE standards, sampling for laboratory analysis, contractor liaison regarding remediation measures, compliance analysis with BC CSR, and confirmation of remediation reporting

**Spill Remediation Confirmation Analysis - CSRD BC 2011** - Scope of services induced; sampling plan design to meet MoE standards, sampling for laboratory analysis, contractor liaison regarding remediation measures, compliance analysis with BC CSR, and confirmation of remediation reporting

**Agricultural Land Capability Assessments (ALR Exclusion, Inclusion, Development) - BC 2011/2012:** Scope of services includes; ALR soil mapping review, on site soil survey, analytical testing, agricultural capability assessment and reporting prepared for the Agricultural Land Commission

**Contaminated Site Investigation and Remediation Various Clients, throughout BC 2005 to Present:** Stage 1 & 2 Preliminary Site Investigations (Phase 1&2 ESAs), Detailed Site Investigations, Land Remediation

**Spill Response/Remediation/Habitat Restoration - Cherryville, (Gagney Creek), BC- 2009 (Currently in Monitoring Phase):** Scope of services included; emergency spill response, installation of water treatment, land remediation, instream works, environmental monitoring, habitat reconstruction and ecological restoration, long term monitoring, regulatory liaison, environmental , freshwater invertebrate surveys

**Environmentally Sensitive Areas Assessments - Various Clients, Okanagan BC - 2010 / 2011:** Identify, classify, rate and map terrestrial ecosystems based on vulnerability and scarcity. Provide GIS mapping, interpretation and methods reporting including mitigation measures for proposed development projects.

**Habitat Restoration Plan - Vernon Airport, Vernon, BC - 2009** - Designed a habitat restoration plan for riparian habitat adjacent to the Vernon Airport.

**Habitat Restoration Plan - Private Land Owner Salmon Arm, BC 2008:** Prepared a restoration strategy to guide the ecological repair of a heavily degraded site along a wetland boundary, to meet regulatory requirements. The final plan incorporated current riparian areas management and restoration practice recommendations to best re-establish a native ecosystem and provide long term support for this location.



**Environmental Impact Assessment - Environmental Assessment - Private Agricultural Land Owner Land, (Grandon Creek), Qualicum, BC 2006:** Developed and implemented a sampling program to determine the impact to soils and surface water on a farm that was subject to composted biosolid application. This project involved designing a sampling plan and method, laying out a representative predetermined sample plan with GIS before conducting sampling, GPS location and confirmation of sample point, collection of soil and surface water samples, soil profiling, determining appropriate laboratory analyses, interpretation of analytical results, and synthesis of a final report.

**Environmental Impact Assessment, Facility Design and Construction Monitoring - Composting Operation, Ladysmith BC 2007:** Designed and performed an Environmental Impact Assessment for a proposed composting facility to meet the requirements of the Organic Materials Recycling Regulation, assisted in facility design to ensure efficient operation and minimize environmental impacts, developed and implemented a long term surface and groundwater monitoring program.

**Groundwater Monitoring Cowichan, (Gordon River), BC 2005-2007:** Surface Water and Groundwater sampling, analysis and interpretation for impacts to groundwater and freshwater aquatic habitat due to numerous wood waste landfills

**Groundwater Monitoring, Chasm, BC 2005-2008:** West Fraser Mills - Conducted groundwater monitoring for on site woodwaste landfills at the Chasm Mill

**Spill Remediation - EnviroWest, Nanaimo BC 2006:** Spill response on a property bordering a salt water marsh, duties included supervision of response activities, sampling of impacted soils and nearby surface water, sample analysis prescription, delineating spill extent, manifested removal of impacted soils to approved treatment facility, reconstruction of the damaged site, analysis interpretation and final report synthesis.

**Riparian Areas Regulation - Various Clients, Southern BC 2006 to Present:** Duties include habitat and site assessment, riparian habitat enhancement measures, impact mitigation management, regulatory liaison, reporting, environmental monitoring, variance applications.

**Environmental Impact Assessment - Land Lessee, Quaaout Reserve, (Little Shuswap Lake), BC - 2009:** Comprehensive EIA performed to review a riparian construction project on Quaaout Reserve. EIA for the project was approved by INAC and DFO.

**Environmental Impact Assessment - Land Owner, Central Okanagan, (Okanagan Lake,) BC - 2009:** Comprehensive EIA performed to review a riparian construction project on Okanagan Lake. EIA for the project was approved by RDCO and MoE.

**Construction Environmental Monitoring Vernon, BC with Naito Environmental, 2010:** Provided daily monitoring during the demolition of a bridge over Vernon Creek. Including on-site technical support, mitigation measure design and implementation, creek condition monitoring, regulatory liaison and reporting.

**Construction Environmental Monitoring Okanagan, (Kalamalka Lake) BC Parks with Naito Environmental, 2010:** Daily Monitoring during the installation of two wharf structures in Kalamalka Lake with bedrock drilled piers in an area of high quality fish habitat. Services included onsite technical support, environmental mitigation measures, reporting, and regulatory liaison.



**Construction Environmental Monitoring for - Katchmar Construction, (Sheridan Lake, Staley Lake, Staley Lake Ck) BC - March 2008 to April 2008:** Provided on-site environmental monitoring for a wetland crossing road construction project. Duties included: daily monitoring, daily log, reporting, regulatory liaison, onsite advice and restoration design

## Skills and Certifications

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### Fieldwork

- Stream surveys & Riparian Areas Assessment
- Freshwater, groundwater, and marine water sampling
- Monitoring well and drill sampling supervision
- Soil texturing, profiling and sampling
- Soil vapour sampling
- Sediment sampling
- Site assessment, descriptions and mapping
- Spill response, investigation, assessment and remediation
- Orienteering and survival knowledge

### Equipment

- Experience with various field meters, multi meters, monitoring apparatus, high flow and low flow purging and sample pumps
- GPS field operator
- SCBA, and SCUBA
- ATV, snowmobile and helicopter awareness
- Small engine use and repair
- Boating 200+ hours (marine and freshwater)

### I.T.

- GIS, CAD
- Web page development
- Office suite competency
- Statistical analysis software
- Data base development
- Data analysis applications

### Courses and Certificates

- Contaminated Site Investigation
- Soil Bioengineering
- Soil Vapour Assessment
- Environmental Monitoring for Construction
- Erosion and Sediment Control
- Riparian Area Regulation Training
- Pleasure Craft Operator
- Streamkeeper Training
- Level 1 First Aid
- Radio telephone operator certificate
- P.A.D.I. advanced open water diver
- R.I.C. certified level 3 GPS field operator
- Class 5 drivers license
- Defensive driving course
- Ecological Control for Invasive Species



## **CATHERINE ORBAN, MSc, PAG**

*ENVIRONMENTAL PLANNER/INSPECTOR & SOIL SPECIALIST*

1977 HARLEQUIN CRES  
NANOOSE BAY, BC, V9P 9J2  
OFFICE: 250-468-7959  
CELL: 250-612-2166  
catherineo@telus.net

### **EDUCATION**

- **M.Sc., Physical Geography (Specializing in Soils) 1990**  
University of Calgary, Calgary, Alberta
- **B.Sc., Physical Geography, 1985**  
University of Calgary, Calgary, Alberta
- **Fine Art - General Studies, 1980**  
Alberta College of Art, Calgary, Alberta

### **SPECIALIZED TRAINING**

- Standard First Aid & CPR  
St John's Ambulance
- H2S Alive
- WHMIS
- ATV – 4x4 Training Course
- Riparian Area Regulation (BC).  
Malaspina University College (2006)
- Remediation Processes for Contaminated Soil and Groundwater.  
EPIC Educational Program Innovations Centre (2001).
- Environmental Regulation in the Oil & Gas Industry.  
Canadian Association of Petroleum Landmen (1996).
- Decommissioning and Reclamation of Small Oil & Gas Sites.  
Petroleum Industry Training Service (1996).
- Introduction to Avalanche & Backcountry Safety

### **PROFESSIONAL AFFILIATIONS**

- British Columbia Institute of Agrologists (P. Ag.)
- Qualified Environmental Professional (QEP)
- Canadian Land Reclamation Association (CLRA)
- Columbia Mountains Institute (CMI)



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## **EMPLOYMENT HISTORY**

**2002 - Environmental Planner/Inspector/Soil Specialist (Independent Consultant)**

**Present** Selected Clients:

TERA Environmental Consultants  
Calgary, Alberta

C&F Land Resource Consultants Ltd.  
Victoria, BC

Spectra Energy (formerly Duke Energy Gas Transmission & Westcoast Energy Inc.)  
Prince George, BC

**2001 - Part Time Instructor (Short Courses)**

**Present** **Various courses in soil management, erosion & sediment control, environmental monitoring & inspection, and planning for pipeline construction projects**

ENFORM Canada (formerly the Petroleum Industry Training Service [PITS])  
Calgary, Alberta

Vancouver Island University (VIU), Natural Resources Extension Program  
Nanaimo, BC

**1996 - Project Manager/Staff Agrologist**

**2002** Matrix Solutions Inc.  
Calgary, Alberta

**1992 - Consulting Soil Specialist/ Environmental Inspector (Independent Consultant)**

**1996** Soils & General Environmental Expertise  
Oil & Gas Sites, Pipelines & Related Projects  
Alberta & BC

**1990 - Project Consultant**

**1992** AGRA Earth & Environmental Ltd.  
Calgary, Alberta

**1986 - Project Coordinator**

**1990** Small Island Research Group (SIRG)  
Calgary, Alberta & St Vincent, WI

**1986 - Graduate Student/Teaching Assistant**

**1990** University of Calgary,  
Department of Geography  
Calgary, Alberta

**1982 - Interpretive Naturalist (Seasonal)**

**1984** Alberta Provincial Parks  
**&1990**

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## **CAREER AND PROJECT EXPERIENCE**

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### **Soil Surveys, Agricultural Land Capability & Terrain Assessments**

- Conducted soils and terrain assessments and prepared reports for various pipeline, wellsite and access road construction projects.
- Conducted detailed soil surveys on government and private properties, and prepared reports for submission to the Agricultural Land Commission (ALC).
- Prepared soil survey and construction as-built reports including; environmental overviews, soil descriptions and classifications, soil handling and reclamation recommendations/plans, and monitoring information.
  - West Wapiti Pipeline Project – Central Alberta Midstream (2005)
  - Lougheed Loop - Southern Mainline Expansion - Duke Energy (2002-2003)
  - Goodrich Acid Gas Re-injection Pipeline - Duke Energy (2003)
  - Calgary-Cochrane Wastewater Pipeline – Stanley Engineering (1999)
  - Empress Gas Plant Expansion (1998)
  - Savona Loop – Westcoast Energy (1995)
  - Alexandria Loop – Westcoast Energy (1995)
  - McLeod Lake Loop – Westcoast Energy (1995)
  - Wolf 16" Pipeline – Westcoast Energy (1994)

### **Contaminated Sites**

- Developed, managed and implemented a variety of environmental assessment, remediation and reclamation projects, from individual leases to an active gas plant site, and a pipeline gathering system.
- Conducted pre-construction as well as Phase I & II assessments and prepared reports for oil and gas sites and facilities.
  - Carstairs-Crossfield Gas Plant – Anderson Exploration Ltd. (1996 – 2002)
  - Midale Oil Pipeline Gathering System – Shell Canada Ltd & Enbridge Pipelines Inc (1999 – 2000)
  - South Elkton Gas Plant – Anderson Exploration Ltd. (1996 – 2002)
  - Wildhay Gas Plant – Berkley Petroleum (2001)

### **International Work Experience**

- CIDA Agronomy Training Projects for farmers, teachers, government personnel and extension officers, St Vincent, WI.
  - Shared responsibility for development and implementation of Agronomy Training Projects (3½ years total), based in St. Vincent, West Indies (completed thesis research concurrently).
- CIDA Angele-Bolhamo irrigation feasibility study, Awash Valley, Ethiopia.
  - Conducted a Socio-Economic Impact Assessment for this irrigation feasibility study in Ethiopia.

### **Project Management/Leadership/Training**

- Updated and delivered the following short courses:
  - "Soils and the Planning Process" ½ day module (Enform)
  - "Soil Handling for Pipeline Construction" 1/2 day module (Enform)
  - "Environmental Planning for Linear Development" 2 day course (Enform)
  - "Pipeline Environmental Inspection" 3 day course (Enform)
  - "Environmental Monitoring for Construction Projects" 3 day course (VIU, NREP)
  - "Erosion & Sediment Control" 3-day course (VIU, NREP)
  - "Aboriginal Environmental Technician Training Program" 5 day course
- Worked with and supervised contractors, consultants and summer students in all areas of expertise (outlined above).
- Acted as liaison with representatives from various regulatory agencies during implementation of various oil and gas projects.
- Prepared a Pest Management Plan for a pipeline corridor in south-central BC.
- Landmark Education - Leadership & Communications – Core Curriculum & Seminars
- Eastern Caribbean Islands - Student Leader - 6-wk field school – U of C Geography



### Pipeline Inspection (Environmental & Soils)

- Supervised implementation of general environmental protection measures during pipeline construction and reclamation activities.
- Conducted liaison with various regulatory agencies during pipeline construction project planning, audits and inspections.
- Supervised soil salvage and handling during pipeline construction, clean-up and reclamation activities.
- Prepared daily progress and as-built reports for environmental protection measures on pipeline construction projects.
  - Joffre CO<sub>2</sub> Pipeline - Penn West (2007)
  - Bullmoose Development Project – Tumbler Ridge, BC – Shell Canada Ltd. (2006-2007)
  - TMX Pump Station Upgrades – Kinder-Morgan (2006)
  - Hythe SW Loop – Encana (2005)
  - Pine Pass Replacement – Duke Energy (2003)
  - Fort St John Replacement – Westcoast Energy (1995)
  - Savona Loop – Westcoast Energy (1995)
  - Alexandria Loop – Westcoast Energy (1995)
  - Wolf 16" Pipeline – Westcoast Energy (1994)
  - South Okanagan Natural Gas Pipeline – BC Gas (1994)
  - Blue Hills Pipeline – Westcoast Energy (1993)

### Environmental Planning

- Carried out coordination, review and management activities for environmental impact assessments and environmental protection plans for various pipeline construction projects in BC, Alberta and the Northwest Territories.
- Conducted environmental orientations, audits and inspections for various pipeline construction projects throughout BC.
- Shared responsibility for development and preparation of the Pest Management Plan (PMP) for Duke Energy Mainline – Southern Region (2003)
- Carried out mapping and data analysis for the purposes of evaluating and selecting sites and routing corridors for natural areas preservation, transmission lines and pipelines.
- Shared responsibility for the development and preparation of environmental and socio-economic impact assessments.
- Responsible for advertising, interviewing, hiring, coordinating & evaluating work for the Aboriginal Environmental Inspector Apprentices on two pipeline construction projects in BC.
  - Access Pipeline Project - Access Pipeline Ltd. (2004)
  - Goodrich Acid Gas Re-injection Pipeline - Duke Energy (2003)
  - Southern Mainline Expansion - Duke Energy (2002-2003)
  - Grizzly Valley Extension - Duke Energy (2003)

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### PUBLICATIONS AND PRESENTATIONS

**Orban, C.M.**, Gayle, J.E., Smith, B.S. and Leggett, S.A. 2000. "Use of Statistical Methods to Assess Soil Conditions Related to Linear Property Transactions." Matrix Solutions Inc., Shell Canada Ltd., Enbridge Pipelines Inc., September 2000.

**Orban, C.** 1990. "Patterns of Variations in Selected Soil Properties, St. Vincent, West Indies." University of Calgary, Master's Thesis.

**Orban, C.**, and W. Matadial. 1989. "Fertilizer Trials on Selected Root Crops in St. Vincent." Paper presented at the 25th Annual Caribbean Food Crop Society Meeting, Guadeloupe, July, 1989.



### **Historic Land Use Additional Detail**

The Subject Property was included in the ALR when the reserve was established (1974-1976). Encroachment of mill operations in the form of wood waste occurred after 1976, as indicated by historic aerial photography. Know approved expansion of the mill operations onto the Subject Property occurred in 1985 and 2000.

The Subject Property has reportedly been previously used by Better Earth Products a composting company. The owner, at that time, of Better Earth (Del Kohnke) reported operating from 2008 to 2011 on the Subject Property. The initial operation by this individual and by extension, this company is referred to in section 2.2.1 of the report as a wood waste contractor, who was screening and trucking the waste to Tolko Industries in Armstrong for use in their cogeneration plant. Due to contamination issues with the wood waste (such as paint) Tolko would no longer receive the product so Mr. Kohnke explored compost opportunities for the remaining wood waste material with his existing composting business Better Earth. As some of the material had naturally composted it was initially sold directly to market, however with little success. Introduction of green nitrogen sources was applied but did not produce a saleable product. The operation of Better Earth on the Subject Property became economically prohibitive and was not viewed as a success by the owner (pers.comm. DK).



**Appendix A – Maps and Figures**  
**982 Old Vernon Rd., Kelowna, BC**



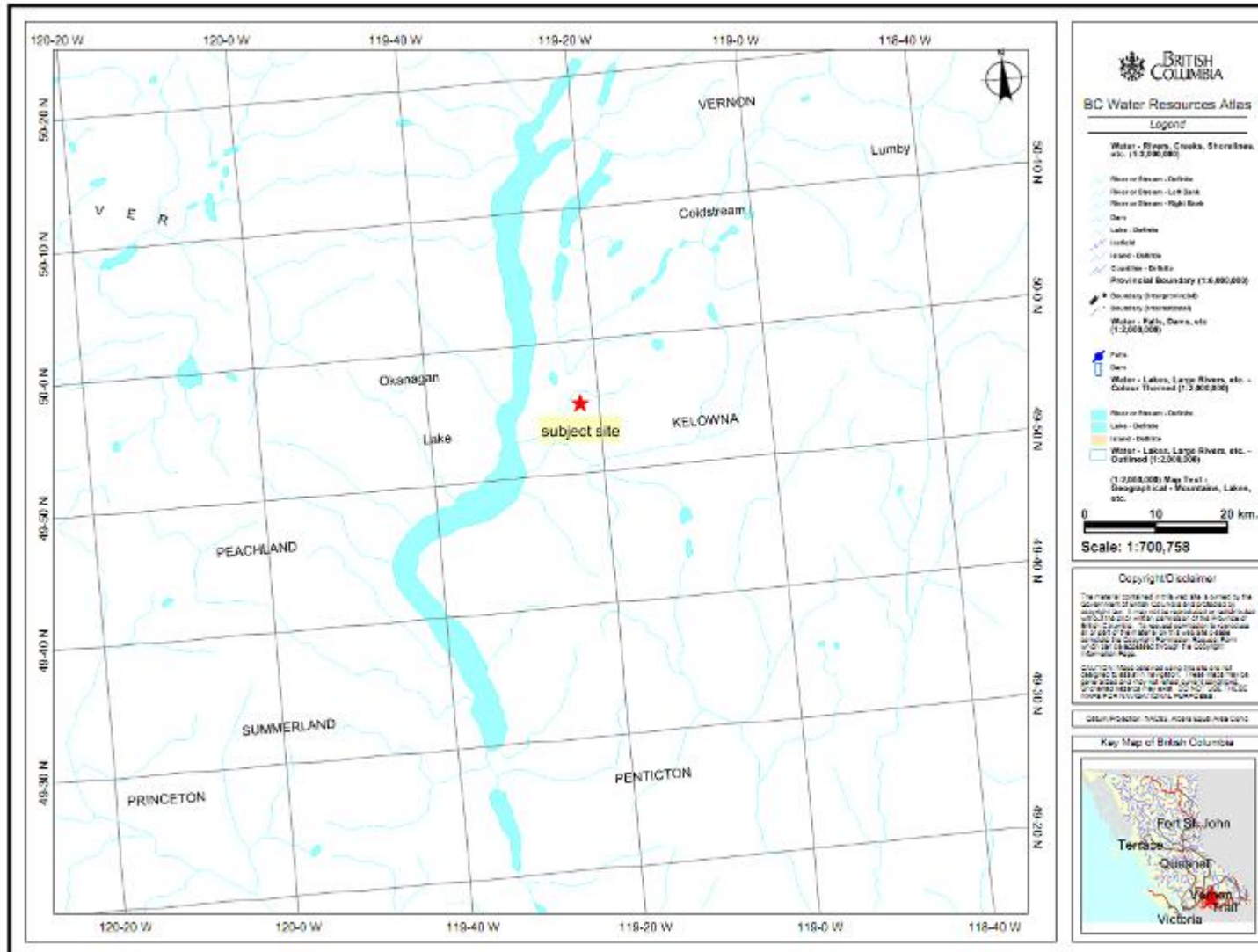


Figure 1: Regional Scale Location Map, 982 Old Vernon Rd., Kelowna BC (Not to scale for discussion purposes only)

Source: [http://www.env.gov.bc.ca/wsd/data\\_searches/wrbc/index.html](http://www.env.gov.bc.ca/wsd/data_searches/wrbc/index.html)





**Figure 2: Location Map, 982 Old Vernon Rd., Kelowna, BC**



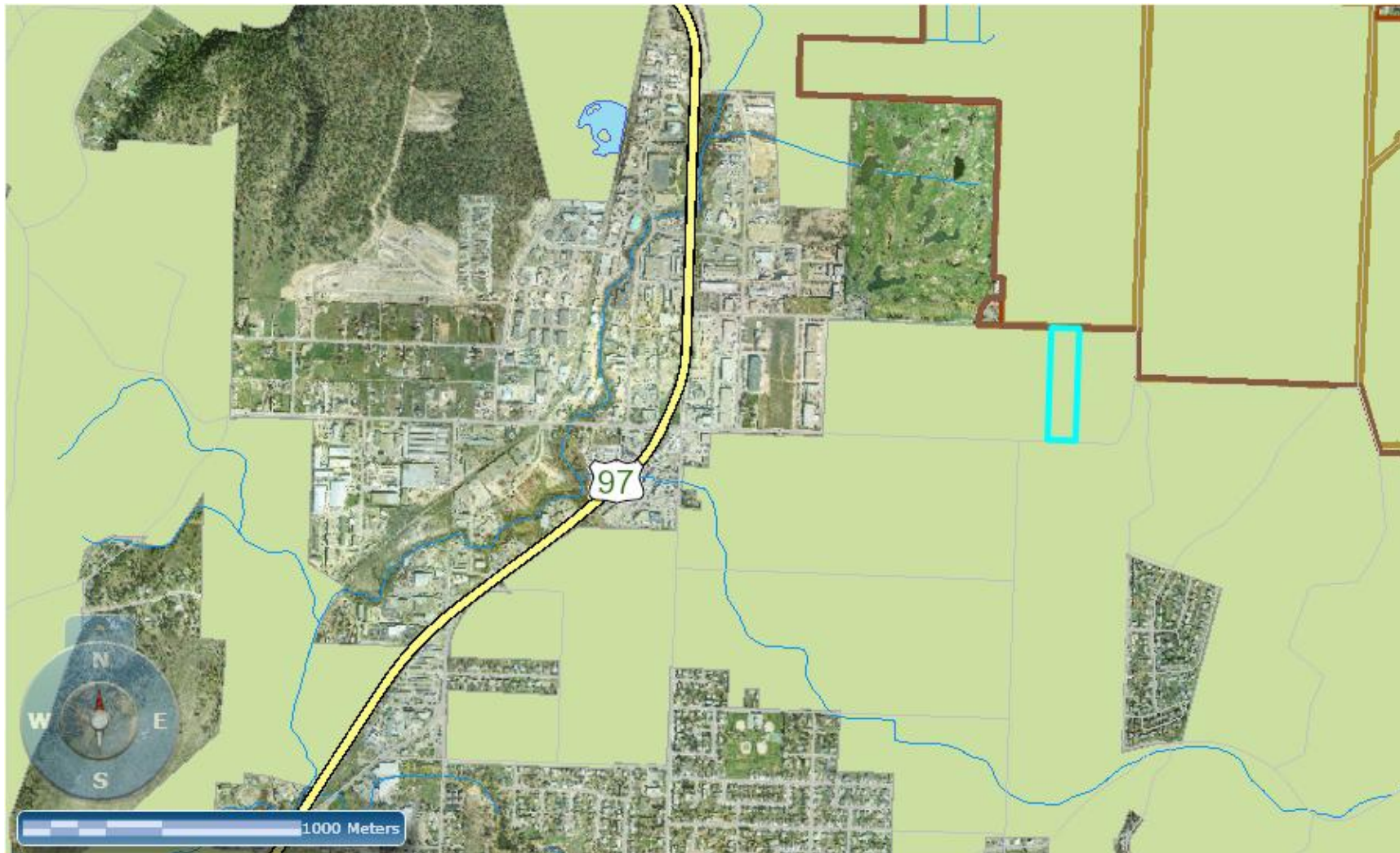


Figure 3: ALR, 982 Old Vernon Rd., Kelowna, BC

Source: RDCO Mapping - Accessed Nov. 15 2012  
[http://www.rdcogis.com/GIS\\_App/RDCO\\_GIS\\_App.html](http://www.rdcogis.com/GIS_App/RDCO_GIS_App.html)







**Figure 4: Contours, 982 Old Vernon Rd., Kelowna BC,  
 1m contour interval**

Source: City of Kelowna - Accessed Nov 15 2012  
[http://www.kelowna.ca/website/ikelowna\\_map\\_viewer/viewer.cfm](http://www.kelowna.ca/website/ikelowna_map_viewer/viewer.cfm)



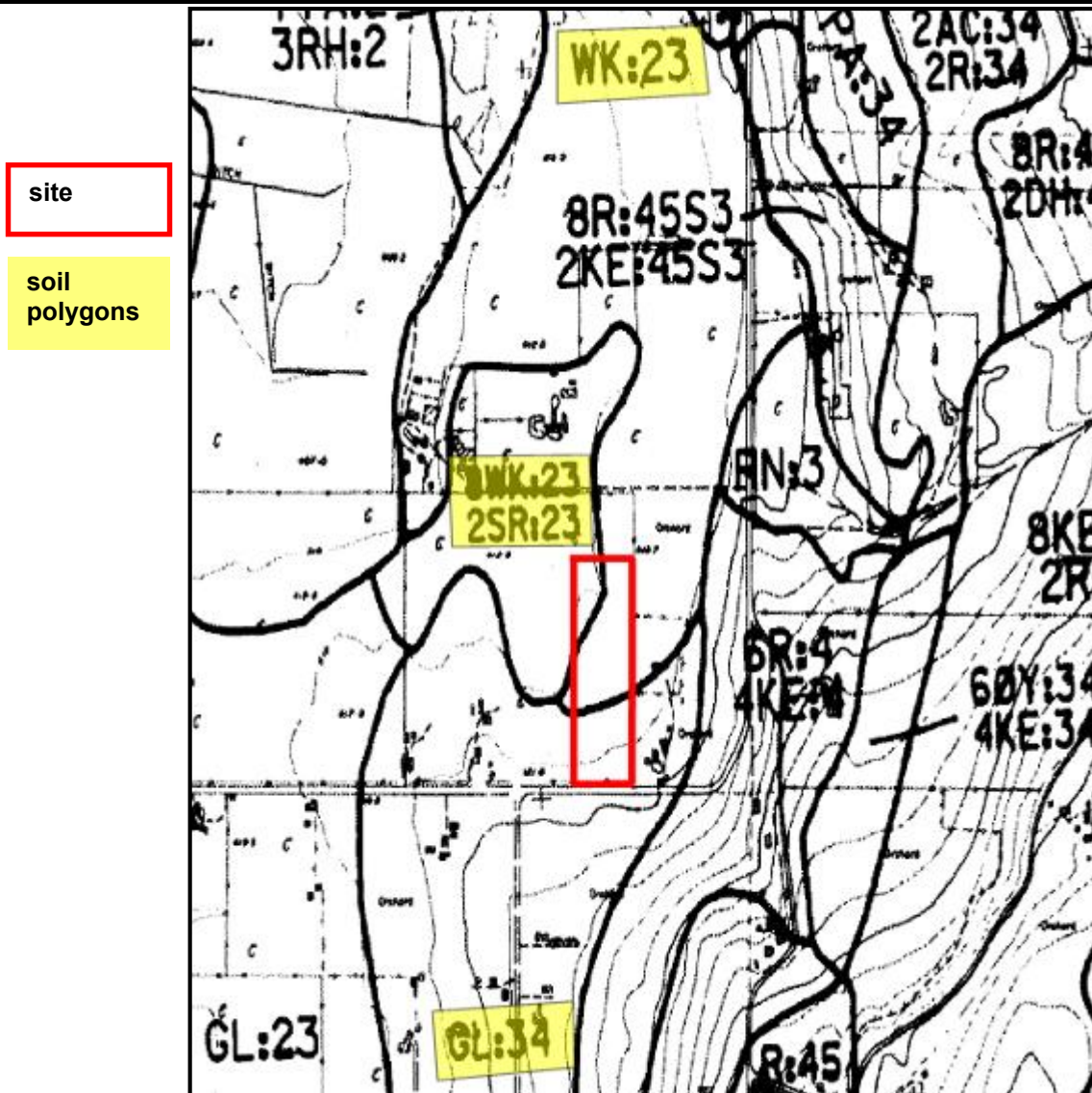
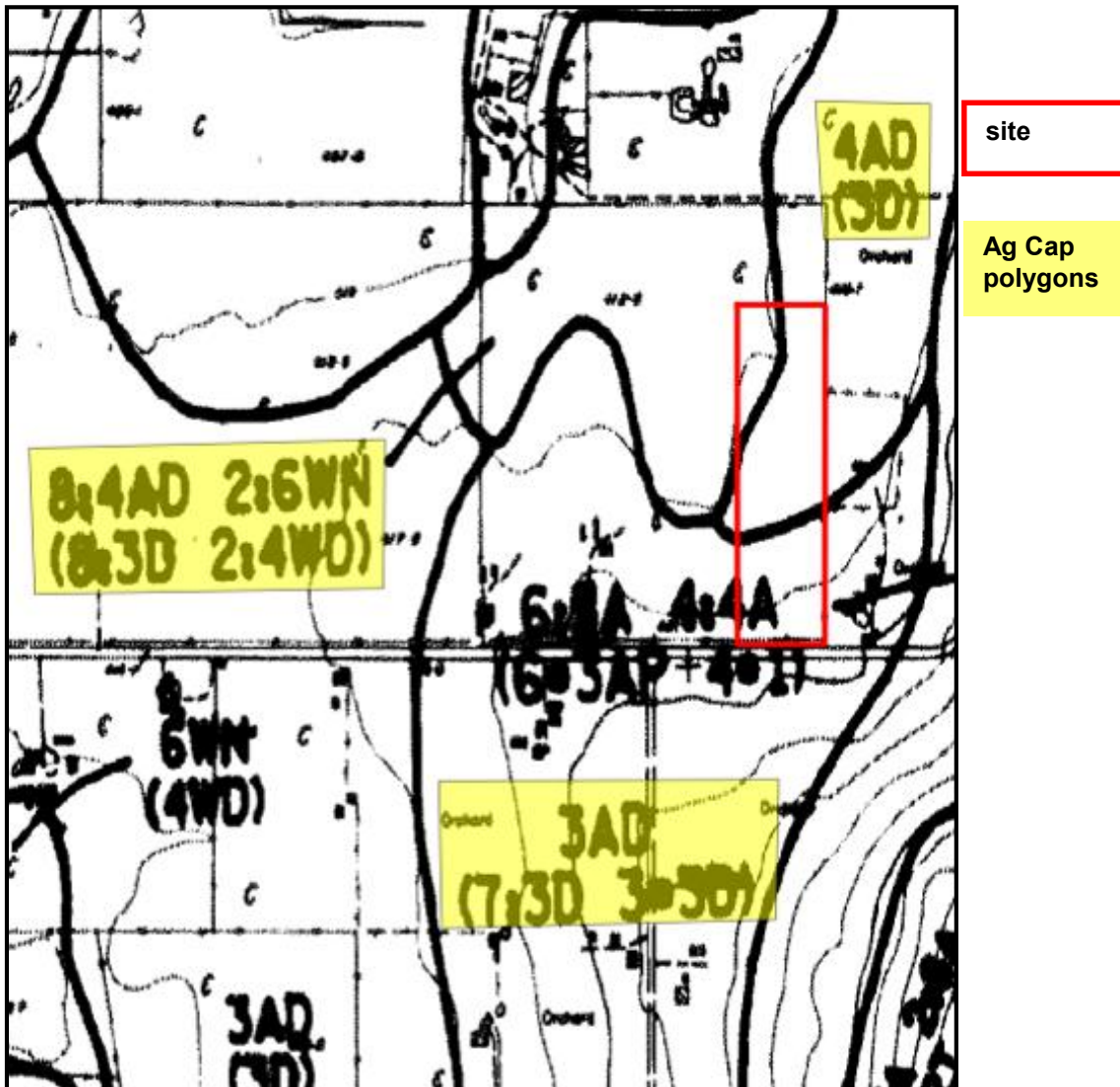


Figure 5: Soils Mapping, 982 Old Vernon Rd., Kelowna, BC,  
5m contour interval

Source: BC MOE; Soil Survey Report No. 52 (1982); Mapsheet 82E.094 @1:20,000 (1987)

WK	WESTBANK	nearly level to strongly sloping stratified glaciolacustrine sediments	100 cm or more of clay, clay loam or silty clay	moderately well	Orthic Gray Luvisol
SR	SUMNERLAND	nearly level to strongly sloping fluvial veneer over glaciolacustrine sediments	10 to 100 cm of silty clay loam grading to clay loam	dominantly poor, ranging to imperfect; fluctuating groundwater table or seepage, subject to flooding	Orthic Humic Gleysol: calcareous and saline phases
GL	GLENMORE	nearly level to moderately sloping stratified glaciolacustrine sediments	100 cm or more of silt loam, silty clay loam or clay loam	well to moderately well	Eluviated Dark Brown

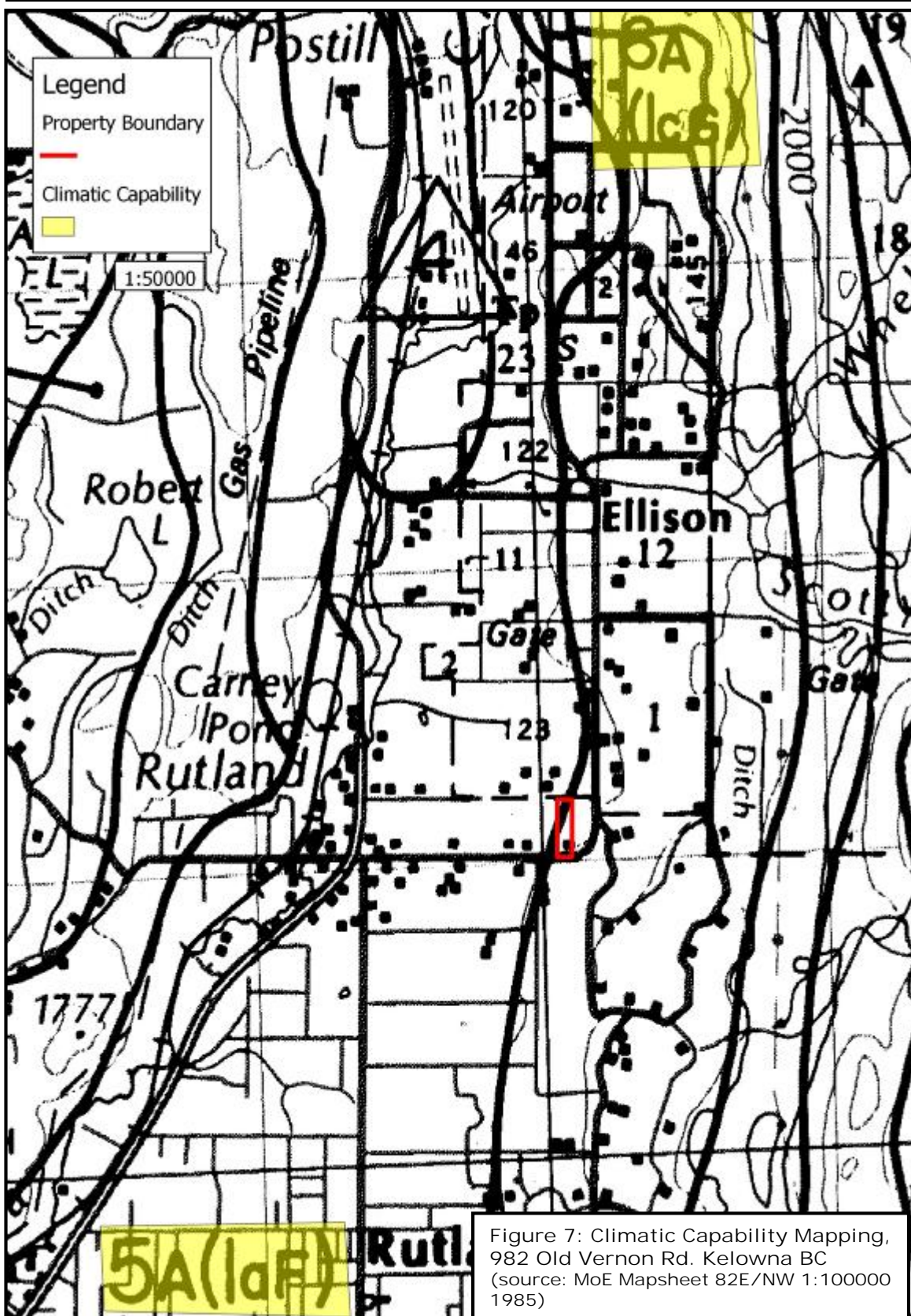




**Figure 6: Agricultural Capability Mapping, 982 Old Vernon Rd., Kelowna, BC**  
Source: BC MOE; Mapsheet 82E.094 @1:20,000 (1987)

CAPABILITY CLASSIFICATIONS	
5AP	- Unimproved Rating
(3AP)	- Improved Rating
*The asterisk is used with the Modified Land Capability Classification for Tree Fruits and Grapes.	
It indicates the modified topography and/or stoniness classes have been used.	
CLASS RATINGS	
1.	Land in this class either has no or only very slight limitations that restrict its use for the production of common agricultural crops.
2.	Land in this class has minor limitations that require good ongoing management practices or slightly restrict the range of crops, or both.
3.	Land in this class has limitations that require moderately intensive management practices or moderately restrict the range of crops, or both.
4.	Land in this class has limitations that require special management practices or severely restrict the range of crops, or both.
5.	Land in this class has limitations that restrict its capability to producing perennial forage crops or other specially adapted crops.
6.	Land in this class is nonarable but is capable of producing native and/or uncultivated perennial forage crops.
7.	Land in this class has no capability for arable culture or sustained natural grazing.







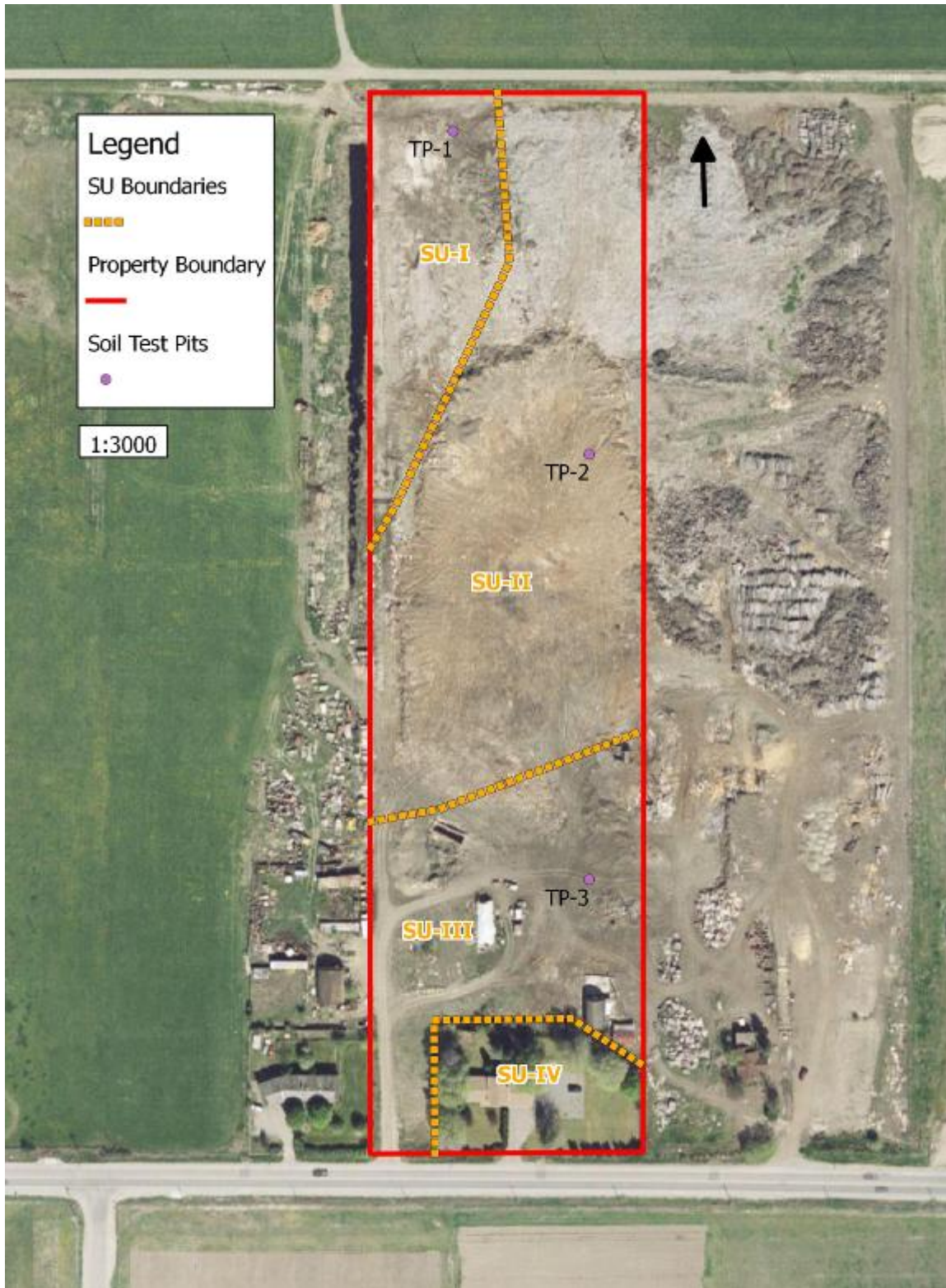


Figure 8: Soil Units and Test Pit Mapping, 982 Old Vernon Rd. Kelowna BC



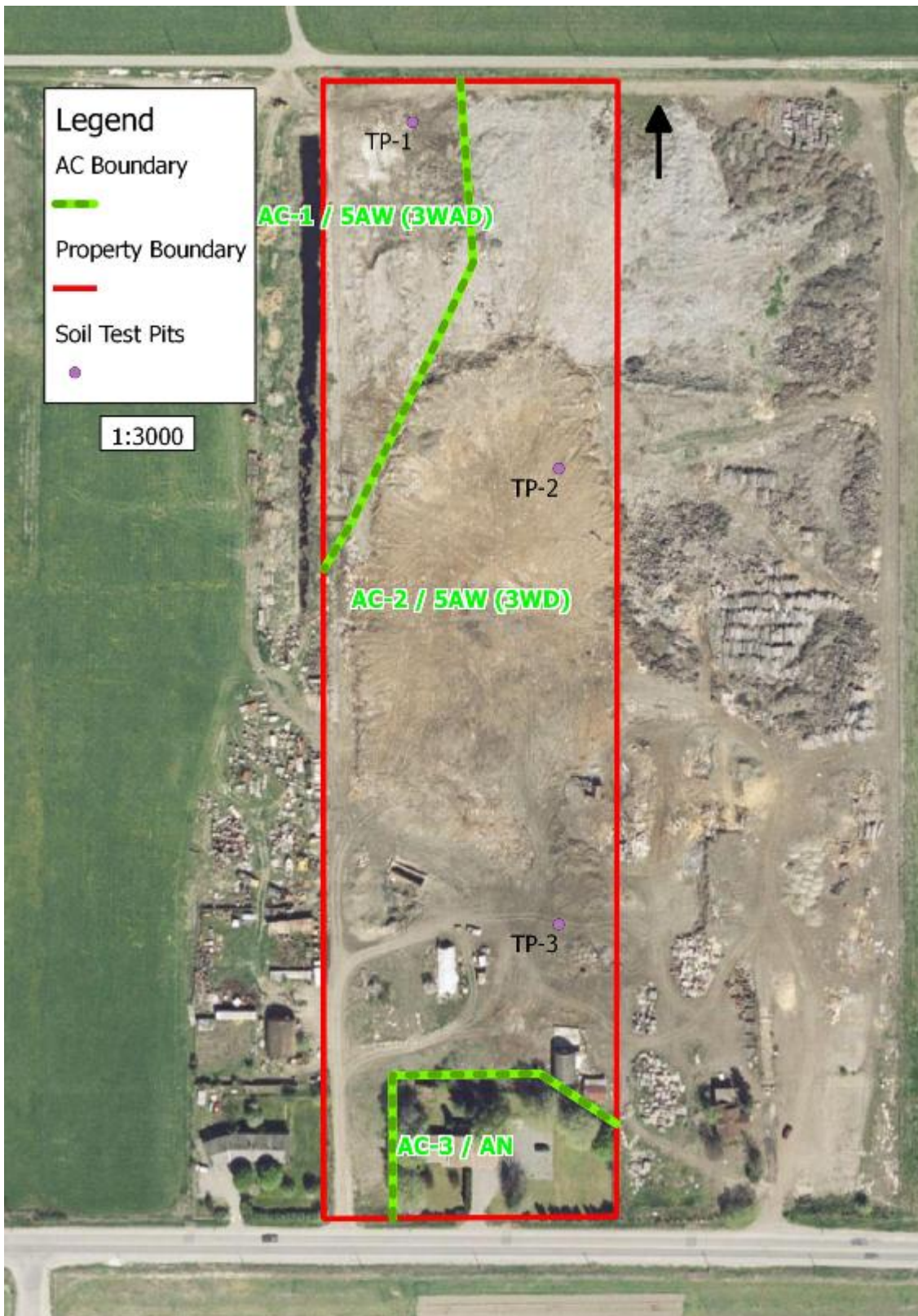


Figure 9: Agricultural Land Capability Mapping, 982 Old Vernon Rd., Kelowna BC



**Appendix B – Site & Soil Test Pit Photos  
982 Old Vernon Rd., Kelowna, BC**





Figure 9: 982 Old Vernon Rd. Kelowna BC – Soil Inspection, Soil test pit location map





Photo 1: South portion of the site showing remaining footprint of mill work, stored machinery, storage bins and home site in background



Photo 2: Central portion of the site showing wood waste on the ground, weedy cover and a wood waste pile in background





Photo 3: Northern portion of the site showing wood waste on the ground, weedy cover and wood waste piles in background



Project 12E043		TP #1	Slope N 1%		24-Oct-12	Overcast 2 C
Depth (cm)	Horizon	Texture	Consistence / Structure	Colour	Mottles	Coarse Fragments
2-0	LFH	-	thatch	-		
0-54	Fill	SL	admixed soil fill / WW	Dk Br	-	10% gravel*
54-70	B	C	firm / massive	DkGr	-	0% gravel
70+	C	HC	v. firm / blocky	Gr	-	0% gravel

Notes: All soil textures determined by laboratory testing, colour based on wet soils

Land Use – Former Mill

Gravel portion > 2.5 cm diameter

Vegetation grass and weeds

\*Coarse fragments are estimated visually

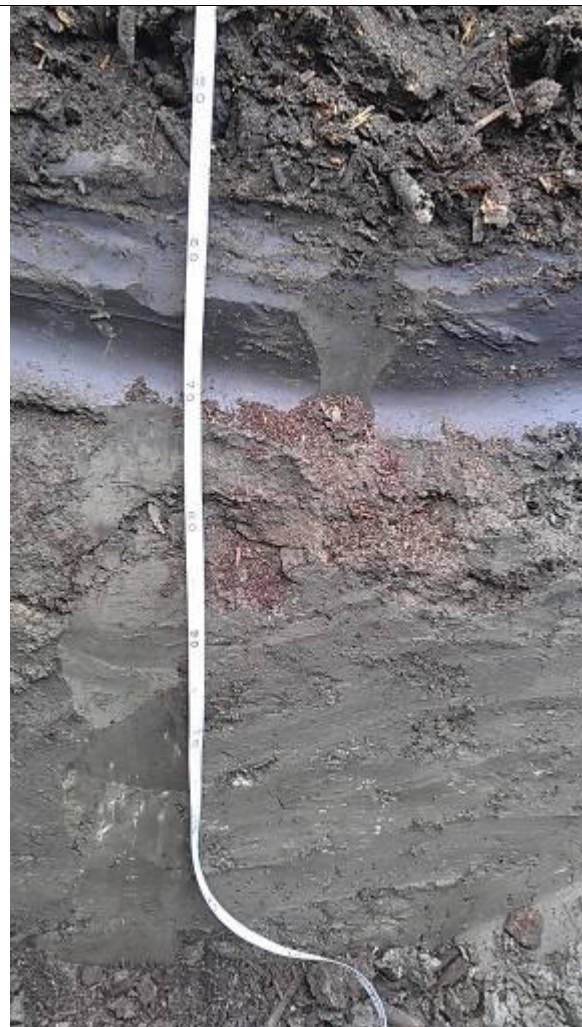
Poorly Drained Site

WW - Wood Waste



0cm to 90cm depth

Photo 4: Test Pit 1 – 982 Old Vernon Rd., Kelowna, BC



50cm to 130cm depth

Photo 5: Test Pit 1 – 982 Old Vernon Rd., Kelowna, BC



Project 12E043		TP #2	Slope NW 2%		24-Oct-12	Overcast 2 C
Depth (cm)	Horizon	Texture	Consistence / Structure	Colour	Mottles	Coarse Fragments
2-0	LFH	-	thatch	-		
0-15	Fill	C	admixed soil fill	Dk Br	-	10% gravel*
15-35	B	C	firm / massive	Gr Br	-	0% gravel
35+	C	HC	v. firm / blocky	Br	-	0% gravel

Notes: All soil textures determined by laboratory testing, colour based on wet soils

Land Use – Former Mill

Gravel portion > 2.5 cm diameter

Vegetation grass and weeds

\*Coarse fragments are estimated visually

Poorly Drained Site



0cm to 70cm depth

Photo 6: Test Pit 2 – 982 Old Vernon Rd., Kelowna, BC



50cm to 130cm depth

Photo 7: Test Pit 2 – 982 Old Vernon Rd., Kelowna, BC



Project 12E043		TP #3	Slope NW 1%		24-Oct-12	Overcast 2C
Depth (cm)	Horizon	Texture	Consistence / Structure	Colour	Mottles	Coarse Fragments
0-35	Fill	L	add mixed fill / WW	Br	-	10% gravel*
35-55	B	HC	v. firm / massive	DkGr	-	0% gravel*
55+	C	HC	v. firm / subangular blocky	Gr	-	0% gravel*

Notes: All soil textures determined by laboratory testing, colour determined with wet soil

Land Use – Former Mill

Gravel portion > 2.5 cm diameter

Vegetation grass and weeds

\* Coarse fragments are estimated visually

Poorly Drained Site

WW - Wood Waste



0cm to 55cm depth

50cm to 130cm depth

Photo 8: Test Pit 3 – 982 Old Vernon Rd., Kelowna, BC

Photo 9: Test Pit 3 – 982 Old Vernon Rd., Kelowna, BC



## Appendix C – Agricultural and Climatic Capability Class Descriptions



## LAND CAPABILITY CLASSES FOR MINERAL SOILS

**CLASS 1:** LAND IN THIS CLASS EITHER HAS NO OR ONLY VERY SLIGHT LIMITATIONS THAT RESTRICT ITS USE FOR THE PRODUCTION OF COMMON AGRICULTURAL CROPS.

Land in Class 1 is level or nearly level. The soils are deep, well to imperfectly drained under natural conditions, or have good artificial water table control, and hold moisture well. They can be managed and cropped without difficulty. Productivity is easily maintained for a wide range of field crops.

**CLASS 2 :** LAND IN THIS CLASS HAS MINOR LIMITATIONS THAT REQUIRE GOOD ONGOING MANAGEMENT PRACTISES OR SLIGHTLY RESTRICT THE RANGE OF CROPS, OR BOTH.

Land in class 2 has limitations which constitute a continuous minor management problem or may cause lower crop yields compared to Class 1 land but which does not pose a threat of crop loss under good management. The soils in Class 2 are deep, hold moisture well and can be managed and cropped with little difficulty.

**CLASS 3:** LAND IN THIS CLASS HAS LIMITATIONS THAT REQUIRE MODERATELY INTENSIVE MANAGEMENT PRACTISES OR MODERATELY RESTRICT THE RANGE OF CROPS, OR BOTH.

The limitations are more severe than for Class 2 land and management practises are more difficult to apply and maintain. The limitations may restrict the choice of suitable crops or affect one or more of the following practises: timing and ease of tillage, planting and harvesting, and methods of soil conservation.

**CLASS 4:** LAND IN THIS CLASS HAS LIMITATIONS THAT REQUIRE SPECIAL MANAGEMENT PRACTISES OR SEVERELY RESTRICT THE RANGE OF CROPS, OR BOTH.

Land in Class 4 has limitations which make it suitable for only a few crops, or the yield for a wide range of crops is low, or the risk of crop failure is high, or soil conditions are such that special development and management practises are required. The limitations may seriously affect one or more of the following practises: timing and ease of tillage, planting and harvesting, and methods of soil conservation.

**CLASS 5:** LAND IN THIS CLASS HAS LIMITATIONS THAT RESTRICT ITS CAPABILITY TO PRODUCING PERENNIAL FORAGE CROPS OR OTHER SPECIALLY ADAPTED CROPS.

Land in Class 5 is generally limited to the production of perennial crops or other specially adapted crops. Productivity of these suited crops may be high. Class 5 lands can be cultivated and some may be used for cultivated field crops provided unusually intensive management is employed and/or the crop is particularly adapted to the conditions peculiar to these lands. Cultivated field crops may be grown on some Class 5 land where adverse climate is the main limitation, but crop failure can be expected under average conditions. Note that in areas which are climatically suitable for growing tree fruits and grapes the limitations of stoniness and/or topography on some Class 5 lands are not significant limitations to these crops.

**CLASS 6:** LAND IN THIS CLASS IS NONARABLE BUT IS CAPABLE OF PRODUCING NATIVE AND OR UNCULTIVATED PERENNIAL FORAGE CROPS.



Land in Class 6 provides sustained natural grazing for domestic livestock and is not arable in its present condition. Land is placed in this class because of severe climate, or the terrain is unsuitable for cultivation or use of farm machinery, or the soils do not respond to intensive improvement practises. Some unimproved Class 6 lands can be improved by draining and/or diking.

**CLASS 7: LAND IN THIS CLASS HAS NO CAPABILITY FOR ARABLE OR SUSTAINED NATURAL GRAZING.**

All classified areas not included in Classes 1 to 6 inclusive are placed in this class. Class 7 land may have limitations equivalent to Class 6 land but they do not provide natural sustained grazing by domestic livestock due to climate and resulting unsuitable natural vegetation. Also included are rockland, other nonsoil areas, and small water-bodies not shown on maps. Some unimproved Class 7 land can be improved by draining or diking.

Source: ALC [http://www.alc.gov.bc.ca/alr/ag\\_cap\\_details.htm](http://www.alc.gov.bc.ca/alr/ag_cap_details.htm), Accessed December 2012



**Appendix D – Analytical Data**  
**982 Old Vernon Rd., Kelowna BC**



## Report Transmission Cover Page

Bill To: Manraj Kandola	Project:	Lot ID: <b>902099</b>
Report To: Manraj Kandola	ID: 12 E043	Control Number: 196-1001
982 Old Vernon Road	Name: Kandola- Ag Cap	Date Received: Oct 26, 2012
Kelowna, BC, Canada	Location: Kelowna	Date Reported: Nov 22, 2012
V1X 6T8	LSD:	Report Number: 1785767
Attn: Manraj Kandola	P.O.:	
Sampled By: MD	Acct code:	
Company: Valhalla		

---

Contact & Affiliation	Address	Delivery Commitments
Matt Davidson Valhalla Environmental	2503 35th Avenue Vernon, British Columbia V1T 2S6 Phone: (250) 275-1471 Fax: (866) 485-1471 Email: matt@valhallaconsulting.ca	On [Report Approval] send (Test Report) by Email - Single Report
Manraj Kandola Manraj Kandola	982 Old Vernon Road Kelowna, British Columbia V1X 6T8 Phone: (250) 765-0619 Fax: null Email: manrajkandola@hotmail.com	On [Report Approval] send (Test Report) by Email - Single Report On [Report Approval] send (Test Report) by Email - Single Report On [Lot Approval and Final Test Report Approval] send (Invoice) by Email - Single Report On [Lot Approval and Final Test Report Approval] send (Invoice) by Email - Single Report

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### Notes To Clients:

- Insufficient sample volume to complete dry sieve analysis on sample 902099-1.
- Report was re-issued to include missing dry sieve analysis on samples 902099-2 to 8. Report 1785767 replaces original report 1779561.



**Sample Custody**

Bill To: Manraj Kandola	Project:	Lot ID: <b>902099</b>
Report To: Manraj Kandola	ID: 12 E043	Control Number: 196-1001
982 Old Vernon Road	Name: Kandola- Ag Cap	Date Received: Oct 26, 2012
Kelowna, BC, Canada	Location: Kelowna	Date Reported: Nov 22, 2012
V1X 6T8	LSD:	Report Number: 1785767
Attn: Manraj Kandola	P.O.:	
Sampled By: MD	Acct code:	
Company: Valhalla		

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**Sample Disposal Date: December 05, 2012**

All samples will be stored until this date unless other instructions are received. Please indicate other requirements below and return this form to the address or fax number on the top of this page.

Extend Sample Storage Until \_\_\_\_\_ (MM/DD/YY)

The following charges apply to extended sample storage:

Storage for an additional 30 days	\$ 2.50 per sample
Storage for an additional 60 days	\$ 5.00 per sample
Storage for an additional 90 days	\$ 7.50 per sample

Return Sample, collect, to the address below via:

Greyhound

DHL

Purolator

Other (specify) \_\_\_\_\_

Name \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

Phone \_\_\_\_\_

Fax \_\_\_\_\_

Signature \_\_\_\_\_



## Analytical Report

Bill To: Manraj Kandola	Project:	Lot ID: <b>902099</b>
Report To: Manraj Kandola	ID: 12 E043	Control Number: 196-1001
982 Old Vernon Road	Name: Kandola- Ag Cap	Date Received: Oct 26, 2012
Kelowna, BC, Canada	Location: Kelowna	Date Reported: Nov 22, 2012
V1X 6T8	LSD:	Report Number: 1785767
Attn: Manraj Kandola	P.O.:	
Sampled By: MD	Acct code:	
Company: Valhalla		

<b>Reference Number</b>	902099-1
<b>Sample Date</b>	Oct 24, 2012
<b>Sample Time</b>	NA
<b>Sample Location</b>	
<b>Sample Description</b>	TP1 / TP1-01 / 30cm
<b>Matrix</b>	Soil

Analyte	Units	Results	Results	Results	Nominal Detection Limit
<b>Available Nutrients</b>					
Nitrate - N	Available	ug/g	3		2
Phosphorus	Available	ug/g	8		5
Potassium	Available	ug/g	492		25
Sulfate-S	Available	mg/kg	<10		1
Calcium	Available	mg/kg	4580		30
Magnesium	Available	mg/kg	990		5
Sodium	Available	mg/kg	520		30
Ammonium - N	Available-dry basis	ug/g	122		0.3
<b>Soil Acidity</b>					
pH	1:2 Soil:Water	pH	6.2		
Electrical Conductivity	Sat. Paste equiv based on 1:2	dS/m at 25 C	0.54		0.02
Electrical Conductivity	1:2 Soil:Water	dS/m at 25 C	0.26		0.01



## Analytical Report

Bill To: Manraj Kandola  
 Report To: Manraj Kandola  
 982 Old Vernon Road  
 Kelowna, BC, Canada  
 V1X 6T8  
 Attn: Manraj Kandola  
 Sampled By: MD  
 Company: Valhalla

Project:  
 ID: 12 E043  
 Name: Kandola- Ag Cap  
 Location: Kelowna  
 LSD:  
 P.O.:  
 Acct code:

Lot ID: **902099**  
 Control Number: 196-1001  
 Date Received: Oct 26, 2012  
 Date Reported: Nov 22, 2012  
 Report Number: 1785767

	Reference Number	902099-1	902099-2	902099-3	
	Sample Date	Oct 24, 2012	Oct 24, 2012	Oct 24, 2012	
	Sample Time	NA	NA	NA	
	Sample Location				
	Sample Description	TP1 / TP1-01 / 30cm	TP1 / TP1-02 / 60cm	TP1 / TP1-03 / 100cm	
	Matrix	Soil	Soil	Soil	
Analyte	Units	Results	Results	Results	Nominal Detection Limit
<b>Physical and Aggregate Properties</b>					
Moisture at 1/3 bar	%	35.6	38.8	36.8	0.1
Moisture at 15 bar	%	28.1	23.3	23.1	0.1
Texture		Sandy Loam	Clay	Heavy Clay	
Sand	50 µm - 2 mm	% by weight	62.7	19.6	7.6
Silt	2 µm - 50 µm	% by weight	27.3	33.4	15.4
Clay	<2 µm	% by weight	10.0	47.0	77.0



## Analytical Report

Bill To: Manraj Kandola	Project:	Lot ID: <b>902099</b>
Report To: Manraj Kandola	ID: 12 E043	Control Number: 196-1001
982 Old Vernon Road	Name: Kandola- Ag Cap	Date Received: Oct 26, 2012
Kelowna, BC, Canada	Location: Kelowna	Date Reported: Nov 22, 2012
V1X 6T8	LSD:	Report Number: 1785767
Attn: Manraj Kandola	P.O.:	
Sampled By: MD	Acct code:	
Company: Valhalla		

	Reference Number	902099-2	902099-3	902099-4		
	Sample Date	Oct 24, 2012	Oct 24, 2012	Oct 24, 2012		
	Sample Time	NA	NA	NA		
	Sample Location					
	Sample Description	TP1 / TP1-02 / 60cm	TP1 / TP1-03 / 100cm	TP2 / TP2-01 / 15cm		
	Matrix	Soil	Soil	Soil		
Analyte	Units	Results	Results	Results	Nominal Detection Limit	
<b>Particle Size Analysis - Dry Sieve</b>						
2.0 mm sieve	% Retained	% by weight	1.2	0.2	10.6	0.1
500 micron sieve	% Retained	% by weight	0.9	0.7	9.8	0.1
250 micron sieve	% Retained	% by weight	1.1	0.8	3.7	0.1
53 micron sieve	% Retained	% by weight	12.0	1.4	10.0	0.1



## Analytical Report

Bill To: Manraj Kandola  
 Report To: Manraj Kandola  
 982 Old Vernon Road  
 Kelowna, BC, Canada  
 V1X 6T8  
 Attn: Manraj Kandola  
 Sampled By: MD  
 Company: Valhalla

Project:  
 ID: 12 E043  
 Name: Kandola- Ag Cap  
 Location: Kelowna  
 LSD:  
 P.O.:  
 Acct code:

Lot ID: **902099**  
 Control Number: 196-1001  
 Date Received: Oct 26, 2012  
 Date Reported: Nov 22, 2012  
 Report Number: 1785767

	Reference Number	902099-4	902099-5	902099-6	
	Sample Date	Oct 24, 2012	Oct 24, 2012	Oct 24, 2012	
	Sample Time	NA	NA	NA	
	Sample Location				
	Sample Description	TP2 / TP2-01 / 15cm	TP2 / TP2-02 / 30cm	TP3 / TP3-01 / 20cm	
	Matrix	Soil	Soil	Soil	
Analyte	Units	Results	Results	Results	Nominal Detection Limit
<b>Physical and Aggregate Properties</b>					
Moisture at 1/3 bar	%	50.4	40.7	57.7	0.1
Moisture at 15 bar	%	28.2	27.4	37.8	0.1
Texture		Clay	Clay	Loam	
Sand	50 µm - 2 mm	% by weight	25.6	15.2	44.3
Silt	2 µm - 50 µm	% by weight	27.0	27.8	30.7
Clay	<2 µm	% by weight	47.4	57.0	25.0



**Analytical Report**

Bill To: Manraj Kandola	Project:	Lot ID: <b>902099</b>
Report To: Manraj Kandola	ID: 12 E043	Control Number: 196-1001
982 Old Vernon Road	Name: Kandola- Ag Cap	Date Received: Oct 26, 2012
Kelowna, BC, Canada	Location: Kelowna	Date Reported: Nov 22, 2012
V1X 6T8	LSD:	Report Number: 1785767
Attn: Manraj Kandola	P.O.:	
Sampled By: MD	Acct code:	
Company: Valhalla		

	Reference Number	902099-5	902099-6	902099-7	
	Sample Date	Oct 24, 2012	Oct 24, 2012	Oct 24, 2012	
	Sample Time	NA	NA	NA	
	Sample Location				
	Sample Description	TP2 / TP2-02 / 30cm	TP3 / TP3-01 / 20cm	TP3 / TP3-02 / 45cm	
	Matrix	Soil	Soil	Soil	
Analyte	Units	Results	Results	Results	Nominal Detection Limit
<b>Particle Size Analysis - Dry Sieve</b>					
2.0 mm sieve	% Retained	% by weight	0.1	20.8	0.3
500 micron sieve	% Retained	% by weight	0.5	16.4	0.7
250 micron sieve	% Retained	% by weight	0.4	8.0	0.7
53 micron sieve	% Retained	% by weight	3.9	12.8	5.2



## Analytical Report

Bill To: Manraj Kandola  
 Report To: Manraj Kandola  
 982 Old Vernon Road  
 Kelowna, BC, Canada  
 V1X 6T8  
 Attn: Manraj Kandola  
 Sampled By: MD  
 Company: Valhalla

Project:  
 ID: 12 E043  
 Name: Kandola- Ag Cap  
 Location: Kelowna  
 LSD:  
 P.O.:  
 Acct code:

Lot ID: **902099**  
 Control Number: 196-1001  
 Date Received: Oct 26, 2012  
 Date Reported: Nov 22, 2012  
 Report Number: 1785767

Reference Number	902099-7	902099-8
Sample Date	Oct 24, 2012	Oct 24, 2012
Sample Time	NA	NA
Sample Location		
Sample Description	TP3 / TP3-02 / 45cm	TP3 / TP3-03 / 100cm
Matrix	Soil	Soil

Analyte	Units	Results	Results	Results	Nominal Detection Limit
<b>Physical and Aggregate Properties</b>					
Moisture at 1/3 bar	%	38.7	43.7		0.1
Moisture at 15 bar	%	23.9	25.3		0.1
Texture		Heavy Clay	Heavy Clay		
Sand	50 µm - 2 mm	% by weight	15.6	8.6	0.1
Silt	2 µm - 50 µm	% by weight	19.4	9.4	0.1
Clay	<2 µm	% by weight	65.0	82.0	0.1



## Analytical Report

Bill To: Manraj Kandola	Project:	Lot ID: <b>902099</b>
Report To: Manraj Kandola	ID: 12 E043	Control Number: 196-1001
982 Old Vernon Road	Name: Kandola- Ag Cap	Date Received: Oct 26, 2012
Kelowna, BC, Canada	Location: Kelowna	Date Reported: Nov 22, 2012
V1X 6T8	LSD:	Report Number: 1785767
Attn: Manraj Kandola	P.O.:	
Sampled By: MD	Acct code:	
Company: Valhalla		

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<b>Reference Number</b>	902099-8
<b>Sample Date</b>	Oct 24, 2012
<b>Sample Time</b>	NA
<b>Sample Location</b>	
<b>Sample Description</b>	TP3 / TP3-03 / 100cm
<b>Matrix</b>	Soil

---

Analyte	Units	Results	Results	Results	Nominal Detection Limit
<b>Particle Size Analysis - Dry Sieve</b>					
2.0 mm sieve	% Retained	% by weight	<0.1		0.1
500 micron sieve	% Retained	% by weight	0.2		0.1
250 micron sieve	% Retained	% by weight	0.2		0.1
53 micron sieve	% Retained	% by weight	0.6		0.1

Approved by:   
Mathieu Simoneau  
Operations Manager



## Quality Control

Bill To: Manraj Kandola	Project:	Lot ID: <b>902099</b>
Report To: Manraj Kandola	ID: 12 E043	Control Number: 196-1001
982 Old Vernon Road	Name: Kandola- Ag Cap	Date Received: Oct 26, 2012
Kelowna, BC, Canada	Location: Kelowna	Date Reported: Nov 22, 2012
V1X 6T8	LSD:	Report Number: 1785767
Attn: Manraj Kandola	P.O.:	
Sampled By: MD	Acct code:	
Company: Valhalla		

## Available Nutrients

Blanks	Units	Measured	Lower Limit	Upper Limit	Passed QC
Ammonium - N	mg/L	0.035	-0.3	0.3	yes
Nitrate - N	mg/L	0.149	-1	1	yes
Phosphorus	mg/L	0.289	-4	5	yes
Potassium	mg/L	0.074	-3	10	yes
Sulfate-S	mg/L	0.1064	0	1	yes
Calcium	mg/L	1.029	-1	3	yes
Magnesium	mg/L	0.1713	-0	0	yes
Sodium	mg/L	0.8753	-0	2	yes

Date Acquired: October 29, 2012

Replicates	Units	Replicate 1	Replicate 2	% RSD Criteria	Absolute Criteria	Passed QC
Ammonium - N	ug/g	826	854	10	0.6	yes
Nitrate - N	ug/g	36	37	10	2	yes
Phosphorus	ug/g	80	80	10	5	yes
Potassium	ug/g	1620	1550	10	10	yes

Date Acquired: October 29, 2012

Control Sample	Units	Measured	Lower Limit	Upper Limit	Passed QC
Ammonium - N	ug/g	8.3	6.3	9.5	yes
Nitrate - N	ug/g	42	33	47	yes
Phosphorus	ug/g	16	12	18	yes
Potassium	ug/g	280	234	288	yes
Sulfate-S	mg/kg	644	560	806	yes
Calcium	mg/kg	7440	6135	8301	yes
Magnesium	mg/kg	648	550	744	yes
Sodium	mg/kg	80	61	99	yes

Date Acquired: October 29, 2012

Ammonium - N	ug/g	4.0	3.6	4.2	yes
Nitrate - N	ug/g	4	3	5	yes
Phosphorus	ug/g	3	2	4	yes
Potassium	ug/g	31	24	36	yes
Sulfate-S	mg/kg	1	1	1	yes
Calcium	mg/kg	10	9	11	yes
Magnesium	mg/kg	10	9	11	yes
Sodium	mg/kg	10	9	11	yes

Date Acquired: October 29, 2012

## Physical and Aggregate Properties

Replicates	Units	Replicate 1	Replicate 2	% RSD Criteria	Absolute Criteria	Passed QC
Moisture	%	13.2	12.8	10	0.3	yes

Date Acquired: November 05, 2012



## Quality Control

Bill To: Manraj Kandola	Project:	Lot ID: <b>902099</b>
Report To: Manraj Kandola	ID: 12 E043	Control Number: 196-1001
982 Old Vernon Road	Name: Kandola- Ag Cap	Date Received: Oct 26, 2012
Kelowna, BC, Canada	Location: Kelowna	Date Reported: Nov 22, 2012
V1X 6T8	LSD:	Report Number: 1785767
Attn: Manraj Kandola	P.O.:	
Sampled By: MD	Acct code:	
Company: Valhalla		

## Physical and Aggregate Properties -

### Continued

Control Sample	Units	Measured	Lower Limit	Upper Limit	Passed QC
Moisture at 1/3 bar	%	27.2	20.5	32.5	yes
Moisture at 15 bar	%	15.5	11.0	23.0	yes
Date Acquired: October 29, 2012					
Moisture at 1/3 bar	%	38.3	0.0	0.0	yes
Moisture at 15 bar	%	36.9	0.0	0.0	yes
Sand	% by weight	39.6	35.8	45.4	yes
Silt	% by weight	41.0	31.0	43.6	yes
Clay	% by weight	19.4	15.6	28.8	yes
<50 um	% by weight	60.4	54.700	64.300	yes
Date Acquired: October 29, 2012					

## Particle Size Analysis - Dry Sieve

Control Sample	Units	Measured	Lower Limit	Upper Limit	Passed QC
2.0 mm sieve	% by weight	0.1	0.0	0.0	yes
500 micron sieve	% by weight	3.9	0.0	0.0	yes
250 micron sieve	% by weight	7.6	0.0	0.0	yes
53 micron sieve	% by weight	28.2	0.0	0.0	yes
Date Acquired: November 16, 2012					
2.0 mm sieve	% by weight	0.1	0.0	0.0	yes
500 micron sieve	% by weight	3.0	0.0	0.0	yes
250 micron sieve	% by weight	7.4	0.0	0.0	yes
53 micron sieve	% by weight	23.3	0.0	0.0	yes
Date Acquired: November 16, 2012					

## Soil Acidity

Blanks	Units	Measured	Lower Limit	Upper Limit	Passed QC
pH	pH	6	5.3	7.2	yes
Electrical Conductivity	dS/m at 25 C	0.005	-0.00	0.01	yes
Date Acquired: October 30, 2012					
Control Sample	Units	Measured	Lower Limit	Upper Limit	Passed QC
pH	pH	7.3	7.0	7.4	yes
Electrical Conductivity	dS/m at 25 C	1.30	1.15	2.05	yes
Date Acquired: October 30, 2012					



## Methodology and Notes

Bill To: Manraj Kandola	Project:	Lot ID: <b>902099</b>
Report To: Manraj Kandola	ID: 12 E043	Control Number: 196-1001
982 Old Vernon Road	Name: Kandola- Ag Cap	Date Received: Oct 26, 2012
Kelowna, BC, Canada	Location: Kelowna	Date Reported: Nov 22, 2012
V1X 6T8	LSD:	Report Number: 1785767
Attn: Manraj Kandola	P.O.:	
Sampled By: MD	Acct code:	
Company: Valhalla		

## Method of Analysis

Method Name	Reference	Method	Date Analysis Started	Location
Ammonium-N (Extractable) in Soil	Carter	* Extraction of NO <sub>3</sub> -N and NH <sub>4</sub> -N with 2.0 M KCl, 6.2	29-Oct-12	Exova Edmonton
Macronutrients in General Soils	McKeague	* Ammonium Acetate Extractable Cations, 4.51	29-Oct-12	Exova Edmonton
Nutrients in General Soil	Comm. Soil Sci. Pl. Anal.	* Modified Kelowna Soil Test, Vol 26, 1995	29-Oct-12	Exova Edmonton
Particle Size Analysis - GS	Carter	* Hydrometer Method, 55.3	29-Oct-12	Exova Edmonton
Particle Size by Dry Sieve	Carter	* Sieve Analysis (Mechanical Method), 55.4	16-Nov-12	Exova Edmonton
pH and Conductivity in general soil 1:2	McKeague	* 1:2 Soil:Water Ratio, 4.12	29-Oct-12	Exova Edmonton
Sulfate in General Soil	McKeague	* Sulfate Extractable by 0.1M CaCl <sub>2</sub> , 4.47	29-Oct-12	Exova Edmonton
Water Retention Curves	Agronomy No 9, Part 1	* Water Retention: Laboratory Methods, 26-6	29-Oct-12	Exova Edmonton

\* Reference Method Modified

## References

Agronomy No 9, Part	Methods of Soil Analysis, Part 1
Carter	Soil Sampling and Methods of Analysis.
Comm. Soil Sci. Pl.	Communications in Soil Science and Plant Analysis
McKeague	Manual on Soil Sampling and Methods of Analysis

## Comments:

- Insufficient sample volume to complete dry sieve analysis on sample 902099-1.
- Report was re-issued to include missing dry sieve analysis on samples 902099-2 to 8. Report 1785767 replaces original report 1779561.

Please direct any inquiries regarding this report to our Client Services group.

Results relate only to samples as submitted.

The test report shall not be reproduced except in full, without the written approval of the laboratory.



## Appendix E – Resumes



Matthew Davidson BSc., P.Ag., EP., ASCT. – Environmental Scientist

Matthew Davidson is an Environmental Scientist with a background in environmental biology, environmental assessment, land services and contaminated sites. With a diverse work history Matthew has worked for clients in various sectors including oil and gas, forestry, agriculture, land development, construction, recycling, and waste management industries. Project work has taken Matthew throughout British Columbia, into Alberta and the North West Territories. Matthew is a founding partner of Sage Environmental Consulting Ltd and is presently a Partner at Valhalla Environmental Consulting Inc. Coldstream, BC

Environmental Work Experience (11 Years)

<b>Partner / Environmental Scientist</b> Valhalla Environmental Consulting Ltd, Coldstream, BC	July 2011
<b>Owner / Environmental Scientist</b> Sage Environmental Consulting Ltd, Vernon, BC	January 2008
<b>Environmental Scientist</b> TerraWest Environmental Consultants Ltd., Victoria, BC	August 2005
<b>Field Foreman</b> Alpine Environmental Ltd. Fort St. John, BC	May 2001

Education

<b>BSc. Environmental Science</b> , Royal Roads University	2005
<b>Dipl.Tech. Environmental Science</b> , Camosun College	2002
<b>A.S. Biology</b> , Camosun College	1999

Professional Associations

<b>P.Ag.</b> – British Columbia Institute of Agrologists ( <b>BCIA</b> )
<b>ASCT.</b> – Applied Science Technologists and Technicians of British Columbia ( <b>ASTTBC</b> )
<b>E.P.</b> – Environmental Professional (Eco Canada)
A5 - Restoration & Reclamation
A7 - Environmental Protection Management
<b>SER</b> – Member of the Society for Ecological Restoration

Environmental Work Summary

- Stage 1 & 2 preliminary site investigations (PSI), Detailed Site Investigations (DSI) & Land Remediation
- Ecological Restoration Project Design and Management
- Environmental Impact Assessments
- Riparian Areas Assessments
- Environmental Monitoring for Construction Projects and Instream Works
- Erosion and Sediment Control Design, Implementation and Monitoring
- Spill response, and remediation of terrestrial and aquatic spills
- Policy writing & application package preparation
- Facility audit design and implementation for environmental compliance and performance
- Environmental Sampling Program Design and Implementation
- Instructor for Malaspina College; WHMIS, TDG, Spill Response and Environmental Awareness courses
- Site assessments and inspections for pipelines right of way and oil and gas well sites
- Industrial waste management, for the upstream Oil & Gas Industry
- Agricultural Land Capability Assessments (ALR)
- Habitat Assessment and Mapping
- Groundwater / Water Quality Monitoring Design and Implementation



## Select Project Portfolio

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**Construction Environmental Monitoring - BC 2012** - Services included environmental monitoring for two bridge construction projects over fish bearing streams in BC's southern interior. Daily logging and summary reporting were provided to the client and Ministry of Forests Lands and Natural Resource Operations.

**Environmentally Sensitive Areas Assessment and Terrestrial Habitat Mapping - Vernon BC 2011/2012** - Provided habitat mapping of the Foothills Neighbourhood in Vernon BC to inform the City of Vernon neighbourhood plan development. Services included review of existing TEM and SEI 1:20000 mapping, confirmation field visits to updated and correct existing mapping to current conditions, creation of site specific 1:3000 habitat mapping, invasive species survey, rare and endangered species survey, and reporting.

**Spill Remediation Confirmation Analysis - West Kootenay BC 2011/2012** - Scope of services induced; sampling plan design to meet MoE standards, sampling for laboratory analysis, contractor liaison regarding remediation measures, compliance analysis with BC CSR, and confirmation of remediation reporting

**Spill Remediation Confirmation Analysis - CSRD BC 2011** - Scope of services induced; sampling plan design to meet MoE standards, sampling for laboratory analysis, contractor liaison regarding remediation measures, compliance analysis with BC CSR, and confirmation of remediation reporting

**Agricultural Land Capability Assessments (ALR Exclusion, Inclusion, Development) - BC 2011/2012:** Scope of services includes; ALR soil mapping review, on site soil survey, analytical testing, agricultural capability assessment and reporting prepared for the Agricultural Land Commission

**Contaminated Site Investigation and Remediation Various Clients, throughout BC 2005 to Present:** Stage 1 & 2 Preliminary Site Investigations (Phase 1&2 ESAs), Detailed Site Investigations, Land Remediation

**Spill Response/Remediation/Habitat Restoration - Cherryville, (Gagney Creek), BC- 2009 (Currently in Monitoring Phase):** Scope of services included; emergency spill response, installation of water treatment, land remediation, instream works, environmental monitoring, habitat reconstruction and ecological restoration, long term monitoring, regulatory liaison, environmental , freshwater invertebrate surveys

**Environmentally Sensitive Areas Assessments - Various Clients, Okanagan BC - 2010 / 2011:** Identify, classify, rate and map terrestrial ecosystems based on vulnerability and scarcity. Provide GIS mapping, interpretation and methods reporting including mitigation measures for proposed development projects.

**Habitat Restoration Plan - Vernon Airport, Vernon, BC - 2009** - Designed a habitat restoration plan for riparian habitat adjacent to the Vernon Airport.

**Habitat Restoration Plan - Private Land Owner Salmon Arm, BC 2008:** Prepared a restoration strategy to guide the ecological repair of a heavily degraded site along a wetland boundary, to meet regulatory requirements. The final plan incorporated current riparian areas management and restoration practice recommendations to best re-establish a native ecosystem and provide long term support for this location.



**Environmental Impact Assessment - Environmental Assessment - Private Agricultural Land Owner Land, (Grandon Creek), Qualicum, BC 2006:** Developed and implemented a sampling program to determine the impact to soils and surface water on a farm that was subject to composted biosolid application. This project involved designing a sampling plan and method, laying out a representative predetermined sample plan with GIS before conducting sampling, GPS location and confirmation of sample point, collection of soil and surface water samples, soil profiling, determining appropriate laboratory analyses, interpretation of analytical results, and synthesis of a final report.

**Environmental Impact Assessment, Facility Design and Construction Monitoring - Composting Operation, Ladysmith BC 2007:** Designed and performed an Environmental Impact Assessment for a proposed composting facility to meet the requirements of the Organic Materials Recycling Regulation, assisted in facility design to ensure efficient operation and minimize environmental impacts, developed and implemented a long term surface and groundwater monitoring program.

**Groundwater Monitoring Cowichan, (Gordon River), BC 2005-2007:** Surface Water and Groundwater sampling, analysis and interpretation for impacts to groundwater and freshwater aquatic habitat due to numerous wood waste landfills

**Groundwater Monitoring, Chasm, BC 2005-2008:** West Fraser Mills - Conducted groundwater monitoring for on site woodwaste landfills at the Chasm Mill

**Spill Remediation - EnviroWest, Nanaimo BC 2006:** Spill response on a property bordering a salt water marsh, duties included supervision of response activities, sampling of impacted soils and nearby surface water, sample analysis prescription, delineating spill extent, manifested removal of impacted soils to approved treatment facility, reconstruction of the damaged site, analysis interpretation and final report synthesis.

**Riparian Areas Regulation - Various Clients, Southern BC 2006 to Present:** Duties include habitat and site assessment, riparian habitat enhancement measures, impact mitigation management, regulatory liaison, reporting, environmental monitoring, variance applications.

**Environmental Impact Assessment - Land Lessee, Quaaout Reserve, (Little Shuswap Lake), BC - 2009:** Comprehensive EIA performed to review a riparian construction project on Quaaout Reserve. EIA for the project was approved by INAC and DFO.

**Environmental Impact Assessment - Land Owner, Central Okanagan, (Okanagan Lake,) BC - 2009:** Comprehensive EIA performed to review a riparian construction project on Okanagan Lake. EIA for the project was approved by RDCO and MoE.

**Construction Environmental Monitoring Vernon, BC with Naito Environmental, 2010:** Provided daily monitoring during the demolition of a bridge over Vernon Creek. Including on-site technical support, mitigation measure design and implementation, creek condition monitoring, regulatory liaison and reporting.

**Construction Environmental Monitoring Okanagan, (Kalamalka Lake) BC Parks with Naito Environmental, 2010:** Daily Monitoring during the installation of two wharf structures in Kalamalka Lake with bedrock drilled piers in an area of high quality fish habitat. Services included onsite technical support, environmental mitigation measures, reporting, and regulatory liaison.



**Construction Environmental Monitoring for - Katchmar Construction, (Sheridan Lake, Staley Lake, Staley Lake Ck) BC - March 2008 to April 2008:** Provided on-site environmental monitoring for a wetland crossing road construction project. Duties included: daily monitoring, daily log, reporting, regulatory liaison, onsite advice and restoration design

## Skills and Certifications

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### Fieldwork

- Stream surveys & Riparian Areas Assessment
- Freshwater, groundwater, and marine water sampling
- Monitoring well and drill sampling supervision
- Soil texturing, profiling and sampling
- Soil vapour sampling
- Sediment sampling
- Site assessment, descriptions and mapping
- Spill response, investigation, assessment and remediation
- Orienteering and survival knowledge

### Equipment

- Experience with various field meters, multi meters, monitoring apparatus, high flow and low flow purging and sample pumps
- GPS field operator
- SCBA, and SCUBA
- ATV, snowmobile and helicopter awareness
- Small engine use and repair
- Boating 200+ hours (marine and freshwater)

### I.T.

- GIS, CAD
- Web page development
- Office suite competency
- Statistical analysis software
- Data base development
- Data analysis applications

### Courses and Certificates

- Contaminated Site Investigation
- Soil Bioengineering
- Soil Vapour Assessment
- Environmental Monitoring for Construction
- Erosion and Sediment Control
- Riparian Area Regulation Training
- Pleasure Craft Operator
- Streamkeeper Training
- Level 1 First Aid
- Radio telephone operator certificate
- P.A.D.I. advanced open water diver
- R.I.C. certified level 3 GPS field operator
- Class 5 drivers license
- Defensive driving course
- Ecological Control for Invasive Species



## **CATHERINE ORBAN, MSc, PAG**

*ENVIRONMENTAL PLANNER/INSPECTOR & SOIL SPECIALIST*

1977 HARLEQUIN CRES  
NANOOSE BAY, BC, V9P 9J2  
OFFICE: 250-468-7959  
CELL: 250-612-2166  
catherineo@telus.net

### **EDUCATION**

- **M.Sc., Physical Geography (Specializing in Soils) 1990**  
University of Calgary, Calgary, Alberta
- **B.Sc., Physical Geography, 1985**  
University of Calgary, Calgary, Alberta
- **Fine Art - General Studies, 1980**  
Alberta College of Art, Calgary, Alberta

### **SPECIALIZED TRAINING**

- Standard First Aid & CPR  
St John's Ambulance
- H2S Alive
- WHMIS
- ATV – 4x4 Training Course
- Riparian Area Regulation (BC).  
Malaspina University College (2006)
- Remediation Processes for Contaminated Soil and Groundwater.  
EPIC Educational Program Innovations Centre (2001).
- Environmental Regulation in the Oil & Gas Industry.  
Canadian Association of Petroleum Landmen (1996).
- Decommissioning and Reclamation of Small Oil & Gas Sites.  
Petroleum Industry Training Service (1996).
- Introduction to Avalanche & Backcountry Safety

### **PROFESSIONAL AFFILIATIONS**

- British Columbia Institute of Agrologists (P. Ag.)
- Qualified Environmental Professional (QEP)
- Canadian Land Reclamation Association (CLRA)
- Columbia Mountains Institute (CMI)



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## **EMPLOYMENT HISTORY**

**2002 - Environmental Planner/Inspector/Soil Specialist (Independent Consultant)**

**Present** Selected Clients:

TERA Environmental Consultants  
Calgary, Alberta

C&F Land Resource Consultants Ltd.  
Victoria, BC

Spectra Energy (formerly Duke Energy Gas Transmission & Westcoast Energy Inc.)  
Prince George, BC

**2001 - Part Time Instructor (Short Courses)**

**Present** **Various courses in soil management, erosion & sediment control, environmental monitoring & inspection, and planning for pipeline construction projects**  
ENFORM Canada (formerly the Petroleum Industry Training Service [PITS])  
Calgary, Alberta

Vancouver Island University (VIU), Natural Resources Extension Program  
Nanaimo, BC

**1996 - Project Manager/Staff Agrologist**

**2002** Matrix Solutions Inc.  
Calgary, Alberta

**1992 - Consulting Soil Specialist/ Environmental Inspector (Independent Consultant)**

**1996** Soils & General Environmental Expertise  
Oil & Gas Sites, Pipelines & Related Projects  
Alberta & BC

**1990 - Project Consultant**

**1992** AGRA Earth & Environmental Ltd.  
Calgary, Alberta

**1986 - Project Coordinator**

**1990** Small Island Research Group (SIRG)  
Calgary, Alberta & St Vincent, WI

**1986 - Graduate Student/Teaching Assistant**

**1990** University of Calgary,  
Department of Geography  
Calgary, Alberta

**1982 - Interpretive Naturalist (Seasonal)**

**1984** Alberta Provincial Parks  
**&1990**

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## **CAREER AND PROJECT EXPERIENCE**

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### **Soil Surveys, Agricultural Land Capability & Terrain Assessments**

- Conducted soils and terrain assessments and prepared reports for various pipeline, wellsite and access road construction projects.
- Conducted detailed soil surveys on government and private properties, and prepared reports for submission to the Agricultural Land Commission (ALC).
- Prepared soil survey and construction as-built reports including; environmental overviews, soil descriptions and classifications, soil handling and reclamation recommendations/plans, and monitoring information.
  - West Wapiti Pipeline Project – Central Alberta Midstream (2005)
  - Lougheed Loop - Southern Mainline Expansion - Duke Energy (2002-2003)
  - Goodrich Acid Gas Re-injection Pipeline - Duke Energy (2003)
  - Calgary-Cochrane Wastewater Pipeline – Stanley Engineering (1999)
  - Empress Gas Plant Expansion (1998)
  - Savona Loop – Westcoast Energy (1995)
  - Alexandria Loop – Westcoast Energy (1995)
  - McLeod Lake Loop – Westcoast Energy (1995)
  - Wolf 16" Pipeline – Westcoast Energy (1994)

### **Contaminated Sites**

- Developed, managed and implemented a variety of environmental assessment, remediation and reclamation projects, from individual leases to an active gas plant site, and a pipeline gathering system.
- Conducted pre-construction as well as Phase I & II assessments and prepared reports for oil and gas sites and facilities.
  - Carstairs-Crossfield Gas Plant – Anderson Exploration Ltd. (1996 – 2002)
  - Midale Oil Pipeline Gathering System – Shell Canada Ltd & Enbridge Pipelines Inc (1999 – 2000)
  - South Elkton Gas Plant – Anderson Exploration Ltd. (1996 – 2002)
  - Wildhay Gas Plant – Berkley Petroleum (2001)

### **International Work Experience**

- CIDA Agronomy Training Projects for farmers, teachers, government personnel and extension officers, St Vincent, WI.
  - Shared responsibility for development and implementation of Agronomy Training Projects (3½ years total), based in St. Vincent, West Indies (completed thesis research concurrently).
- CIDA Angele-Bolhamo irrigation feasibility study, Awash Valley, Ethiopia.
  - Conducted a Socio-Economic Impact Assessment for this irrigation feasibility study in Ethiopia.

### **Project Management/Leadership/Training**

- Updated and delivered the following short courses:
  - "Soils and the Planning Process" ½ day module (Enform)
  - "Soil Handling for Pipeline Construction" 1/2 day module (Enform)
  - "Environmental Planning for Linear Development" 2 day course (Enform)
  - "Pipeline Environmental Inspection" 3 day course (Enform)
  - "Environmental Monitoring for Construction Projects" 3 day course (VIU, NREP)
  - "Erosion & Sediment Control" 3-day course (VIU, NREP)
  - "Aboriginal Environmental Technician Training Program" 5 day course
- Worked with and supervised contractors, consultants and summer students in all areas of expertise (outlined above).
- Acted as liaison with representatives from various regulatory agencies during implementation of various oil and gas projects.
- Prepared a Pest Management Plan for a pipeline corridor in south-central BC.
- Landmark Education - Leadership & Communications – Core Curriculum & Seminars
- Eastern Caribbean Islands - Student Leader - 6-wk field school – U of C Geography



### Pipeline Inspection (Environmental & Soils)

- Supervised implementation of general environmental protection measures during pipeline construction and reclamation activities.
- Conducted liaison with various regulatory agencies during pipeline construction project planning, audits and inspections.
- Supervised soil salvage and handling during pipeline construction, clean-up and reclamation activities.
- Prepared daily progress and as-built reports for environmental protection measures on pipeline construction projects.
  - Joffre CO<sub>2</sub> Pipeline - Penn West (2007)
  - Bullmoose Development Project – Tumbler Ridge, BC – Shell Canada Ltd. (2006-2007)
  - TMX Pump Station Upgrades – Kinder-Morgan (2006)
  - Hythe SW Loop – Encana (2005)
  - Pine Pass Replacement – Duke Energy (2003)
  - Fort St John Replacement – Westcoast Energy (1995)
  - Savona Loop – Westcoast Energy (1995)
  - Alexandria Loop – Westcoast Energy (1995)
  - Wolf 16" Pipeline – Westcoast Energy (1994)
  - South Okanagan Natural Gas Pipeline – BC Gas (1994)
  - Blue Hills Pipeline – Westcoast Energy (1993)

### Environmental Planning

- Carried out coordination, review and management activities for environmental impact assessments and environmental protection plans for various pipeline construction projects in BC, Alberta and the Northwest Territories.
- Conducted environmental orientations, audits and inspections for various pipeline construction projects throughout BC.
- Shared responsibility for development and preparation of the Pest Management Plan (PMP) for Duke Energy Mainline – Southern Region (2003)
- Carried out mapping and data analysis for the purposes of evaluating and selecting sites and routing corridors for natural areas preservation, transmission lines and pipelines.
- Shared responsibility for the development and preparation of environmental and socio-economic impact assessments.
- Responsible for advertising, interviewing, hiring, coordinating & evaluating work for the Aboriginal Environmental Inspector Apprentices on two pipeline construction projects in BC.
  - Access Pipeline Project - Access Pipeline Ltd. (2004)
  - Goodrich Acid Gas Re-injection Pipeline - Duke Energy (2003)
  - Southern Mainline Expansion - Duke Energy (2002-2003)
  - Grizzly Valley Extension - Duke Energy (2003)

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### PUBLICATIONS AND PRESENTATIONS

- Orban, C.M.**, Gayle, J.E., Smith, B.S. and Leggett, S.A. 2000. "Use of Statistical Methods to Assess Soil Conditions Related to Linear Property Transactions." Matrix Solutions Inc., Shell Canada Ltd., Enbridge Pipelines Inc., September 2000.
- Orban, C.** 1990. "Patterns of Variations in Selected Soil Properties, St. Vincent, West Indies." University of Calgary, Master's Thesis.
- Orban, C.**, and W. Matadial. 1989. "Fertilizer Trials on Selected Root Crops in St. Vincent." Paper presented at the 25th Annual Caribbean Food Crop Society Meeting, Guadeloupe, July, 1989.



# CITY OF KELOWNA MEMORANDUM

<b>ATTACHMENT</b>	<b>F</b>
This forms part of application # A19-0018	
Planner Initials	BC
 City of <b>Kelowna</b> DEVELOPMENT PLANNING	

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**Date:** November 26, 2019  
**File No.:** A19-0018  
**To:** Land Use Planning Manager (BC)  
**From:** Development Engineering Manager (JK)  
**Subject:** 982 Old Vernon Rd A1

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The Development Engineering Branch has the following comments with regard to this application for non-farm use to allow for tree service operations on the subject property.

General

1. This application does not compromise any City of Kelowna municipal infrastructure.

  
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James Kay, P.Eng.  
Development Engineering Manager

JKH





**ATTACHMENT** G

This forms part of application  
# A19-0018

Planner Initials BC



City of  
**Kelowna**  
DEVELOPMENT PLANNING

November 25 2019

File: A19-0018

City of Kelowna  
1435 Water Street  
Kelowna BC V1Y 1J4  
E-mail: [planninginfo@kelowna.ca](mailto:planninginfo@kelowna.ca)

Re: ALC Non-Farm Use Application A19-0018 at 982 Old Vernon Road

To the City of Kelowna,

Thank you for providing the B.C. Ministry of Agriculture the opportunity to comment on the Agricultural Land Commission non-farm use application at 982 Old Vernon Road. I have reviewed the documents you have provided. From an agricultural perspective I can provide the following comments for your consideration:

- The parcel is located within the Agricultural Land Reserve (ALR), a provincial zone in which agriculture is recognized as the priority use; where farming is encouraged, and non-agricultural uses are restricted.
- Ministry staff acknowledge the apparent efforts by the property owner in undertaking the rehabilitation of the property. The provided referral details describing how the tree chipping business's proposed operations may be advantageous in removing the existing wood debris are recognized. Ministry staff however have concerns regarding the business's potential amount of introduced additional material, the duration of the activity, and long-term impact on the parcel's agricultural viability.
- In addition, given the history of a sawmill on site, Ministry staff also have concerns regarding the potential for any pre-existing contamination and note that a Ministry of Environment (MOE) site profile has not been included in this referral. As described in the provincial *Environmental Management Act*, a site profile would be deemed required with the cease of sawmill operations post-1997 onward. There are other conditions requiring one as well, such as for soil removal and providing it to a municipality under certain circumstances. Ministry staff encourage the applicant to contact MOE staff to confirm if a site profile is required in accordance with provincial legislation, and for Kelowna staff to contact MOE staff to confirm any municipal administrative requirements.

If you have any questions, please contact me directly at [christina.forbes@gov.bc.ca](mailto:christina.forbes@gov.bc.ca) or 250-861-7201.

Sincerely,

Christina Forbes, P.Ag  
Regional Agrologist  
B.C. Ministry of Agriculture – Kelowna  
Office: (250) 861-7201  
E-mail: [christina.forbes@gov.bc.ca](mailto:christina.forbes@gov.bc.ca)

Email copy: ALC Planner, [ALC.Okanagan@gov.bc.ca](mailto:ALC.Okanagan@gov.bc.ca)

Colleen Delaney, MOE Contaminated Sites Officer, [Colleen.Delaney@gov.bc.ca](mailto:Colleen.Delaney@gov.bc.ca)