ALUC AGENDA

ADVISORY LAND USE COMMISSION

Agenda for the Advisory Land Use Commission Meeting of the Village of Pemberton to be held Monday, May 29, 2017 at 5:00pm at 7400 Prospect Street.

	Total Pages
1. CALL TO ORDER	
2. MINUTES	
• Minutes of the ALUC Meeting of January 05, 2017	4
3. REZONING APPLICATION (OR122)	
• Referral Package	192
4. NEW ZONING BYLAW UPDATE	
5. NEW BUSINESS	
6. NEXT MEETING	
7. ADJOURNMENT	

ADVISORY LAND USE COMMISSION

ADVISORY LAND USE COMMITTEE MINUTES

Minutes for the Advisory Land Use Commission of the Village of Pemberton held January 6, 2017 at 5:00 pm at 7400 Prospect Street.

IN ATTENDANCE:	Amica Antonelli Annie Miller Niki Vankerk Richard Nott
REGRETS:	Kathy Jenkins Kirsten McLeod
APPLICATION REPRESENTATIVE:	Kristina Salin
STAFF IN ATTENDENCE:	Lisa Pedrini, Village Planner Suzanne Bélanger, Project Coordinator
PUBLIC IN ATTENDENCE:	One member of the public (Plateau Resident)

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1) CALL TO ORDER

At 5:10 pm the meeting was called to Order.

2) ELECTION OF CHAIR and VICE-CHAIR

Election of Chair and Vice Chair was held as there was a quorum in attendance.

Moved/Second
THAT Niki Vankerk be re-elected as the Chairperson of the Advisory Land Use Commission.
CARRIED

Moved/Second
THAT Kirsten McLeod be re-elected as Vice-Chairperson of the Advisory Land Use Commission.
CARRIED

3) MINUTES

Moved/Seconded
THAT the minutes of the ALUC meeting held November 24, 2016 be approved as circulated.
CARRIED

4) TUP008-PEMBERTON MUSIC FESTIVAL

The Village Planner gave an overview of the application:

- This new Temporary Use Permit application is for 2017-2018-2019 for a multi-day event.
- The renewal request includes ten (10) parcels in the Village boundaries, which is a fewer number of parcels than the previous years.
- Commission Members should focus comments on the land use for the properties within the Village Boundaries.
- No new public roads are requested.
- The request is for up to 60,000 participants.
  The previous festival attendance numbers were as follow:
  - 2014- 19,669
  - 2015- 28,623
  - 2016- 41,000
- A "*Memorandum of Understanding*" (MOU) among the Agricultural Land Commission (ALC), the Village of Pemberton and the SLRD is in place to set intentions for agricultural enhancements. The MOU was a key part of the Commission's decision to permit the Non-Farm Use in the ALR until the end of 2019. This MOU will require amending to add the Phare and Ayers properties (SLRD) that were included last year as per the ALC's approval.
- Some of the economic benefits of the Festival are: jobs, local spending, increased tourism, increased provincial tax money, etc.
- The hearsay of the festival having a longer event (over two weekends) has not been requested by the applicant.

The Commission members discussed the application and even though all members recognize the economic benefits, they nevertheless had the following concerns:

- Land & water usage impact with the possible increase of attendees (up to 60,000).
- Safety of pedestrian and cyclers during the event.
- Parking impact on ALR lands
- Lack of detail from HUKA as to the agricultural benefits reaped from the Pemberton Music Fund.
- Festival equipment that remains on the sites following the event (i.e. fencing, storage materials, etc.)
- Lack of follow through on some aspects of their communication (i.e. Plateau residents)
- Lack of washroom facilities (i.e. shuttle stops/parking areas, etc.)
- Attendees use of lake & streams for bathing
- Lack of details with respect to the type of attractions proposed (i.e. Zipline)

The Representative for the Applicant was able to communicate with David Buttrey and supply answers to some of the Commission's questions.

- In terms of agricultural enhancements, HUKA is meeting with the Pemberton Farmer's association and with Pemberton Chamber of Commerce to better communicate what we have done and synergies moving forward. They have a call setup next week with them.

- HUKA has increased hay production year over year, invested in $500,000 worth of irrigation, built a drainage channel in I.R.2 and are now looking at ways to partner with VOP and ALC for larger infrastructure projects throughout the area.
- In terms of improving safety for pedestrians and cyclists, HUKA is looking at smaller lighting equipment options along the highway which create light without blocking the pedestrian's ability to walk along the shoulder of the road. We are speaking with MOTI on improvements and there is also talks of a cycling path being built along the highway which we would support if it goes through
- In terms of improving community engagement, especially with residents of the Plateau, Michelle LeRoux will be sending out an invite to meet with Plateau residents again at the end of this month. HUKA will be adding security to the entrances to their neighborhood as well as signage at each entrance and offering the option of local's only vehicle passes to keep out unwanted cars or traffic.
- In terms of decreasing the number of vehicles travelling up the Sea to Sky, HUKA is partnering with a 3rd party bus ride share company this year that allows patrons to request a bus trip (much like Uber).
- In terms of ensuring agricultural land is not sterilized (i.e. not used for farming because of the Festival use), Ayers/McLeod is rotational crop grazing for cattle. Oats were put down last year and the hay yield will increase this year.
- And with respect to the main festival grounds, HUKA does not allow cars to park on the grass there. HUKA is hoping to be able to offer the ability for micro farming to happen seasonally on the main property in the off-season but we are still working out the details with Chamber and Local Farmer's Institute as it will take the right approach to ensure it is done well and is sustainable.
- In terms of adding more portable toilets to parking areas, HUKA uses a ratio of one (1) toilet for every 150 attendees in the bowl (main concert area) but we plan to add many more portables, hand washing stations, trash and recycling areas in the parking area,
- In terms of adding more showers and bathrooms in town, the Chamber is looking to increase the number in town,
- In terms of keeping festival patrons from using lakes and rivers to bathe, HUKA is also working with bylaw officers to increase the price of the fine for going in the river. Also HUKA is increasing the number of flushable toilets in the main property and increasing the number of shower heads in each of the campgrounds.

Following this, the Commission passed the following recommendation:

Moved/Seconded

***THAT** the ALUC recommends that Council support the renewal of the three year Temporary Use Permit (TUP 00*) to authorize the Pemberton Music Festival on ten (10) Village properties subject to the following conditions:*

- *That water usage by the PMF does not negatively impact the water needs of the community at large.*
- *That the Community Fund continues as per the current contribution ($3/ticket), that these funds continue to be used in large part to support agricultural initiatives, and that the list of recipients & supported projects be made public.*
- *That the PMF identifies and continues to support farming initiatives.*
- *That the Post Event Closure Report be made public.*
- *That the PMF conduct a minimum of 1 pre and post-event engagement or town hall session each year, with separate sessions for Plateau residents and that the PMF public concerns raised and their responses to those concerns.*

- *That the PMF made efforts to substantively reduce the amount of parking on ALR lands, by use of transit, shuttles or other measures.*
- *That an improved and detailed Pedestrian and Cycling Plan be submitted, that is practical, enforceable and safe.*
- *That increased portable toilets be provided in parking areas, and other locations such as One Mile Lake park, downtown and shuttle stops.*
- *That the PMF consider including a local entrance at the rear of the Plateau area with secured bike parking for use by locals.*
- *That all structures are appropriately permitted as required by VoP Bylaws i (i.e. the Portable on the Sunstone property).*
- *That storage of festival materials, including temporary fencing, does not occur on ALR Lands post festival, as required by ALC regulations.*
- *That new on-site attractions (i.e., zip-line, water slide, etc.) be reviewed & approved by Village staff in advance.*

CARRIED

5) NEW BUSINESS

- The Village is undertaking a review of the Zoning Bylaw and have contracted KWC Planning Services to assist with the Review. This initiative will be brought to the ALUC for their consideration later this year.
- Village Staff mentioned that 2017 is expected to be very active with many anticipated developments & new constructions.

6) NEXT MEETING

The Commission will be notified when the next meeting will be held.

7) ADJOURNMENT

At 7:05 p.m. the meeting was terminated.

This is a true and correct copy of a
meeting of the Advisory Land Use
Commission of the Village of Pemberton,
held January 05, 2017.

_____

CHAIR Signature

PO Box 100
7400 Prospect St.
Pemberton
British Columbia
CANADA
V0N2L0

P. 604.894.6135
F. 604.894.6136

www.pemberton.ca

To: Chief Administrative Officer - Nikki Gilmore
Finance Manager - Lena Martin
Corporate & Legislative Services Manager - Sheena Fraser
Fire Chief - Robert Grossman
Manager of Operations & Development Services -Tim Harris
Village Engineer - Graham Schulz
Public Works Supervisor - Jeff Westlake

Re: Rezoning Application-OR122
BC Hydro Site-Lot 5, DL 203, KAP31658, LLD (1363 Aster Street)

The Village has received a rezoning application from WSP Canada Inc. on behalf of BC Hydro. The objective of the application is to allow a site specific amendment to the C-1 zone to permit a Public Utility use on Lot 5, DL 203, KAP31658, LLD only, in order to allow BC Hydro to make upgrades to its facility. The current use of the site, occupied by BC Hydro since the early 1960's, became legal non-conforming with the adoption of Zoning Bylaw No. 466, 2001; therefore a zoning bylaw amendment is required in order to redevelop the site.

Please review the attached documents and provide your comments to the Planning Department by May 30, 2017. Should you have any questions, please do not hesitate to contact me at lpedrini@pemberton.ca or at 604-894-6135 ext. 234.

Yours Truly,

Lisa Pedrini

Lisa Pedrini
Village Planner

cc: Operations & Development Services Coordinator – Suzanne Belanger

Attachment: Zoning Amendment Summary & Draft Bylaw

Referral Summary

Project: OR122-BC Hydro Field Office

Civic Address	**1363 Aster Street, Pemberton**			
Legal Description	**Lot**	**District Lot**	**Plan**	**L.L.D.**
	5	**203**	**31658**	**Lillooet Land District**
Owner's Name(s)/Address		**Agent's Name:** David Mate		
BC Hydro, c/o Sean Rodrigues		WSP Canada Inc.		
333 Dunsmuir Street		Phone: 604-455-5376		
Vancouver BC V6B 5R3		Cell: 778-229-1510		
		E-Mail Address: david.mate@wspgroup.com		

Application Request	Rezoning to allow BC Hydro to redevelop their existing Field Office Building
Existing OCP Designation	Downtown
Existing Zoning Designation	C-1 Town Centre Commercial
Proposed OCP Amendment	N/A
Proposed Zoning Amendment	Amend the C-1 Zone to permit a site specific Utility Works Yard

Proposed Lots	N/A

Village Planning Staff Comments:

BC Hydro would like to upgrade its field office/works yard located at the northeast corner of Aster and Dogwood. The facility no longer meets BC Hydro's operational needs and safety standards and the field office is in poor condition and contains building code issues. The facility was built in the 1960's and it does not conform to any of the permitted uses in the C-1 Zone of the Village's Zoning Bylaw No. 466, 2001. For this reason, it is considered a legal non-conforming use.

With respect to non-conforming status, the *Local Government Act* stipulates that a non-conforming use cannot be extended (enlarged) but may remain only if the use does not change or cease to exist for longer than six months. Therefore, in order for BC Hydro to redevelop the site, the applicants must seek an amendment to the Village Zoning Bylaw to either amend the C-1 zone to explicitly permit the public utility use at this location, or rezone the property from C-1 back to P-1. Once informed of this, BC Hydro sought other alternatives to rezoning. BC Hydro's site selection process included screening prospective properties in accordance with a comprehensive list of requirements to operate as post-disaster, including:

1. Outside of the ALR
2. Outside of the floodplain
3. North of "suicide hill" and south of Mt. Currie
4. Fully serviced lot (water, sewer, power, etc)
5. Fit within overall project budget, including an analysis of selling the existing property, and re-building on an alternative property
6. Good geotechnical soils
7. Free of environmental contamination
8. Outside of Federal and Provincial lands, including Reserve lands
9. Outside of residential areas
10. Level site with access for trucks
11. 1.5 acres and fairly rectangular

54 properties initially identified and as the attached map demonstrates, after applying the first five (5) criteria, 51 of the 54 were eliminated, and the balance of the remaining three (3) property areas shown in

orange failed to meet the test of the other requirements listed. BC Hydro concluded that all properties, including their current property, had "issues" but that the current site was best able to meet their requirements. As a result, BC Hydro has submitted a rezoning application for their current site.

A historical review of the Village records revealed that this use was conforming in the previous Zoning Bylaw No. 247, 1989 (the site was then zoned **P1** – **Public Use**) as well as in the original Zoning Bylaw No. 152, 1983. With the adoption of Bylaw 466, 2001, the subject property's zoning changed from Public (P-1) to Town Centre Commercial (C-1), to eventually cease the public utility works use in this location in the future, and facilitate its future redevelopment into a permitted use.

The intent of the C-1 Zone is to accommodate uses usually found in a town centre. When Zoning Bylaw No. 466, 2001 was adopted, the following commercial/light industrial uses were not carried forward:

- "Sign Shop";
- "Tire Dealer";
- "Appliance and Repair Store";
- "Car Wash" and
- "Combined Hardware and Covered Building Supply".

However, other similar commercial/light industrial uses in the downtown core were grandfathered on a site-specific basis. The four specific uses that were intentionally allowed to continue in the C-1 Zone were:

- "Auto Repair Shop" (currently Black's Tires);
- "Equipment Servicing, Rental and Repair Shop" (Valley Chainsaw);
- "Glass & Mirror Repair Shop" (Mountain Glass) and
- "Gasoline Service Station" (currently AC Gas).

The request needs to be reviewed in the context of the OCP and the Downtown Enhancement Strategy. The application does not require an Official Community Plan (OCP) Amendment, as the property is designated **Downtown** which includes '*a diversity of uses such as residential, commercial, services, mixed use, civic, institutional, assembly, parks and open spaces, light industrial and transportation and utilities uses*.' The property is also located within the Downtown Revitalization Development Permit Area No. 4, whereby the Village encourages enhancements and redevelopment of the downtown area to provide a more vibrant environment for businesses, residents and visitors. If the property is successfully rezoned, the redevelopment of the site will require a form and character DP to be issued.

In terms of the 2009 Downtown Enhancement Strategy, it prioritizes a mix of land uses at increased densities, a strong sense of arrival, pedestrian friendly streetscapes, focused and designed open spaces/landscaping. Opportunities to provide public art, streetscape furniture and lighting that share Pemberton's authentic identity and landscaping features that showcase natural assets are encouraged.

Staff recommends that this request be contemplated by permitting a Public Utility use in the C-1 Zone on a site-specific basis and thus amending Zoning Bylaw No. 466, 2001, to:

(1) Add a definition of "Utility Use" to **Section 104 - Definitions**; and
(2) Add "Utility Use" to "**Section 306.1 - Permitted Land Uses**" of the C-1 Zone**,** with a notation that "This use shall only be permitted on Lot 5, Plan 31658, D.L. 203, LLD, and is not permitted on any other lands in this zone."

The attached draft bylaw presents the proposed zoning amendment.

Lisa Pedrini	**May 2, 2017**
Planning Department Signature	Date

Appendix 1

N

Non Suitable Property Includes:
- Floodplain
- ALR
- Non-Serviced Utility
- Crown (Federal and Provincial)
- First Nation
- Inaccessible and Grade Restricted
- Lot Size and Shape

Legend

- Highway
- Major Road
- Local Road
- Resource Road
- Historical Floodplain
- Agricultural Land Reserve

Cadastral

- Crown Federal
- Crown Provincial
- Municipal
- Private
- Unknown

- Existing District Office
- Potential Property (Private Lot)
- Non Suitable Property
- Indian Reserve
- River and Lake
- Wetland

Cadastral data provided by ICIS and is current to April 4, 2017.
Historical Floodplain, Road, and Water data provided by the BC Government.

Pemberton Site Location

0 250 500 1,000 Metres

Date: 2017-04-05
Mapped: CW
Coordinate System: NAD 1983 UTM Zone 10N
Scale: 40,000

D:\Requests\20170404_BreJordanPembertonFloodMap\FloodMapPembertonMap2.mxd

4/5/2017 - 2:54:20 PM

Appendix 2

PROJECT NO. : 151-14182-00

BC HYDRO PEMBERTON FIELD OFFICE- REZONING APPLICATION

MARCH 14, 2017

BC Hydro
Power smart

TABLE OF CONTENTS

1

BC HYDRO WITHOUT PREJUDICE LETTER

BC Hydro
Power smart

17 February 2017

Village of Pemberton
Box 100 – 7400 Prospect Street
Pemberton, BC V0N 2L0

Attention: Tim Harris, Manager of Operations & Development Services

Subject: BC Hydro's Project at 1363 Aster Street, Application for Rezoning.

Dear Mr. Harris:

Please find attached BC Hydro's application in respect for Rezoning of our property located at 1363 Aster Street. We are committed to supporting the long term needs of the community and value our continued relationship. As such, we have put our best foot forward.

We confirm BC Hydro's application in respect of rezoning is made without prejudice to any powers, rights and immunities BC Hydro may have under the Hydro and Power Authority Act (RSBC 1996) Chapter 212, or otherwise. BC Hydro also advises that based on these powers, rights and immunities this application should not be construed as an ongoing agreement by BC Hydro to apply for similar permits or any other regulatory permits of the Village of Pemberton with respect to the subject project/ development or any other projects/developments of BC Hydro.

We look forward to working with you and the community, shoulder to shoulder, towards receiving your final approval of our application.

Respectfully Yours,

Sean F. Rodrigues Architect AIBC MRAIC
Project Manager
604-699-9004
sean.rodrigues@bchydro.com

Encl. Rezoning Application

2 DEVELOPMENT – GENERAL INFORMATION

Village of PEMBERTON

Box 100 | 7400 Prospect Street
Pemberton BC V0N 2L0
P: 604.894.6135 | F: 604.894.6136
Email: admin@pemberton.ca
Website: www.pemberton.ca

DEVELOPMENT-GENERAL INFORMATION

Application:
- ☑ OCP Bylaw Amendment &/or Zoning Bylaw Amendment **(Form OR13)**
- ☐ Development Permit **(Form MDP13)**
- ☐ Major or Minor Development Permit **(Form Minor DP)**
- ☐ Development Variance Permit **(Form DVP13)**
- ☐ Temporary Use Permit **(Form MDP13)**
- ☐ Subdivision, Bare Land Strata Approval & Strata Title Conversion **(Form SUB13)**
- ☐ Antenna System Siting Review **(Form ANT 13)**

All Applications **Please include Application Requirements Form (Checklist)**

SITE

Civic Address: 1363 ASTER STREET

Legal Description:
PID: 003-621-791 Lot: 5
District Lot(DL): 203 Plan: 31658

OWNER(S)

Owner Name(s): BC HYDRO
ATTN: SEAN RODRIGUES
Mailing Address: 333 DUNSMUIR ST 13th FLOOR
VANCOUVER BC V6B 5R3

Home:
Work: 604 699 9004
Cell: 604 219 0802
Email: Sean.Rodriguese bchydro.com

OWNER(S) AGENT IF APPLICABLE

Agent's Name: WSP CANADA INC
ATTN: DAVID MATÉ
Mailing Address: 20339 96th AVE UNIT 100
LANGLEY BC V1M 0E4

Work: 604 455 5376
Fax: 604 533 0768
Cell: 778 229 1510
Email: david.mate@wspgroup.com

☐ *If applicable* **Please include Owner's Authorization**

X *Owner Signature* per Date 14 FEB 2017

X *Authorized Agent Signature* Date 14 FEB 2017

COMMENTS:

Application No

Fee: $ 7,650.

3

AMENDMENT TO THE OCP AND/OR ZONING BYLAWS (0R13)

APPLICATION REQUIREMENTS FOR AN OFFICIAL COMMUNITY PLAN BYLAW AMENDMENT AND/OR ZONING BYLAW AMENDMENT

1. **Pre-Application Meeting**

It is strongly recommended that prior to submitting an application to amend the Official Community Plan and/or the Zoning Bylaw, an applicant should meet with the Village of Pemberton's Development Services Department to review application requirements. The intent of the pre-application will be to confirm specific submission requirements for each proposal.

It is important to have the Village identify the information required for the application since any applications deemed incomplete by the Development Services Department will not be accepted and subsequently returned to the applicant.

2. **Submission Checklist**

- ☑ Complete Application Form *(Form OR13)*
- ☑ Application Fee *(in accordance with Development Procedures Bylaw No. 725, 2013)*
- ☑ Certificate of State of Title or of Indefeasible Title *(dated no more than thirty (30) days prior to submission of the application must accompany the application as a proof of ownership)*
- ☐ Copy of Charges on Title *(i.e. covenants, rights of way, statutory building schemes, etc)*
- ☑ Owners Agent Authorization *(if applicable)*
- ☑ Site Profile (*as per* http://www.env.gov.bc.ca/epd/remediation/site_profiles/index.htm)

3. **Property Information**

Legal Description: LOT 5 D.L. 203 LILLOOET DISTRICT PLAN 31658

PID#: 003-621-791

Civic Address: 1363 ASTER STREET

Property Size*: 0.517ha.

Current OCP Land Use Designation *(Schedules A and B of the OCP Bylaw)*:

C-1 TOWN CENTRE COMMERCIAL

Proposed OCP Land Use Designation *(Schedules A and B of the OCP Bylaw)*:

M-1 INDUSTRIAL

Existing Use/Development on the Property: BC HYDRO FIELD OFFICE

Proposed Use/Development of the Property: BC HYDRO FIELD OFFICE

Lands within Agricultural Land Reserve: N/A

4. **Project Summary Information Checklist** *(provide in written format)*

- ☑ Description of Proposed Development
- ☑ Rationale in Support of the Proposed Development
- ☑ Overview of the Proposed OCP and/or Zoning Bylaw Amendment(s)
- ☐ Consistency with OCP Policies and Maps
- ☐ Proposed OCP Policy Amendment(s)
- ☐ Proposed OCP Map Amendment(s)
- ☐ Proposed Zoning Regulation Amendment(s)
- ☐ Proposed Zoning Bylaw Map Amendment(s)

5. **Supporting Plans and Illustrations Checklist**
(hard copies include full size plans and reductions as well as a digital copy)*

- ☑ Location Context Plan
- ☐ Conceptual Site Plan *(indicating development footprints, approximate density, parks/playgrounds, preservation areas, access roads, trails. parking, transit stops, watercourses, agricultural lands, etc.)*
- ☐ Site Development Statistics *(approximate area, unit count, building coverage, area, height, parking, loading, bike racks, etc.)*
- ☑ Environmental Review *(refer to Schedule B of the OCP)*
- ☑ Geotechnical and Slope Stability Study *(by a qualified professional)*
- ☑ Viewscape Analysis
- ☑ Archeological Overview *(by a qualified professional)*
- ☑ Lot Grading Plan
- ☑ Stormwater Management Plan
- ☑ Traffic Impact Study
- ☐ Photographs of the property
- ☐ Existing Subdivision (Legal) Plan
- ☐ Proposed Subdivision Plan
- ☑ Existing and Proposed Slope Analysis
- ☐ Aerial Photo Map
- ☐ Additional Information _____

6. **Servicing Information**
(written text and hard copies of plans to include full size plans and reductions as well as a digital copy)*

- ☑ Location Plan for Road Access Points
- ☑ Description of Existing or Proposed Storm Drainage flows
- ☑ Description of Existing or Proposed Water Service Connections
- ☑ Description of Existing or Proposed Available Sewer Service Connections
- ☑ Description of Existing or Proposed Road Access
- ☑ Location Plan of Existing and Proposed Water and Sewer connections
- ☐ Information to be provided regarding development for the Village to perform an independent evaluation of the water and sanitary requirements in context of the existing systems:
    - AutoCAD based base plan illustrating the onsite collection/distribution system of each utility. Base plan must be referenced to legal cadastral.
    - Sanitary catchment plan complete with calculations and expected pipe inverts.
    - Water system plan complete with all expected fixtures (fire hydrants, air valves etc. if applicable) and load calculations. Fire Underwriters Survey fire flow calculation sheet under a Professional Engineer's seal.

- Proposed onsite and offsite works in AutoCAD format for each utility as supported above.
- Preliminary ground elevations within the development.

VILLAGE OF PEMBERTON
DEVELOPMENT APPLICATION REQUIREMENTS AND FORMS

APPLICATION FORM FOR AN AMENDMENT TO THE OFFICIAL COMMUNITY PLAN AND/OR ZONING BYLAWs (OR13)

I/We hereby make application under the provisions of Part 26 of the *Local Government Act* and the Village's Development Procedure Bylaw No. 725, 2013 for:

- ☐ An Amendment to the Official Community Plan Bylaw and/or
- ☑ An Amendment to the Zoning Bylaw

to permit development on lands legally described as:

Lot: 5, Plan: 31658, District Lot: 203, LLD.

THIS APPLICATION IS MADE WITH MY FULL KNOWLEDGE AND CONSENT

per

Registered owner's signature

14 FEB 2017

Date

Where the applicant is NOT the REGISTERED OWNER, the application must be signed by the REGISTERED OWNERS designated AGENT and proof thereof must be registered in the office of the Village of Pemberton.

FOR OFFICE USE ONLY:

Application/File No.: _____

Application Fee received $_____ Receipt No.: _____

Date received: _____

_____

Signature of Official

4

SCHEDULE A-3 APPLICATION FOR ZONING AMENDMENT

SCHEDULE "A-3"

APPLICATION FOR ZONING AMENDMENT

I/We hereby apply for an amendment to the text of the Zoning Bylaw No. 466, 2001 to change the Land Use Designation of the property described as (legal description):

Lot: 5, Plan: 31658, DL: 203, LLD.; and located at: (street address or general location)

1363 ASTER STREET

from (current designation) C-1 to (proposed designation) M-1.

The required application fee of $ 7,650 and completed Rezoning Information Form Schedule A-4 are hereby are attached.

THIS APPLICATION IS MADE WITH MY FULL KNOWLEDGE AND CONSENT!

Registered owner's signature

14 FEB 2017
Date

Where the applicant is NOT the REGISTERED OWNER, the application must be signed by the REGISTERED OWNERS designated AGENT and proof thereof must be registered in the office of the Village of Pemberton.

FOR OFFICE USE ONLY:

Date received: _____

Application/File No.: _____

Application Fee received $_____

Receipt No.: _____

_____
Signature of Official

5

SCHEDULE A-4 ZONING AMENDMENT INFORMATION FORM

SCHEDULE "A-4"

Zoning Amendment Information Form

THE INFORMATION REQUESTED IN THIS FORM IS REQUIRED TO EXPEDITE THE APPLICATION AND ASSIST THE STAFF IN PREPARING A RECOMMENDATION.

This form is to be completed in full and submitted with all requested information, Zoning Amendment Application, Application Fee and Certificate of State of Title or of Indefeasible title for the subject property.

1. **APPLICANT AND REGISTERED OWNER**

a) Applicants/Contact name: DAVID MATÉ WSP CANADA INC.

Please note: The name noted above will be considered to be the **main contact person** on all issues related to the application.

Mailing Address: UNIT 100

Street Address: 20339 96th AVE LANGLEY BC V1M 0E4

Email Address: david.mate@wspgroup.com

Telephone No.: 604 455 5376 (Business) 6045330768 (Fax) 7782291510 (Cell)

b) Registered Owner's Name: BC HYDRO - SEAN RODRIGUES

Address: 333 DUNSMUIR ST.

Mailing Address: 13th FLOOR

Street Address: 333 DUNSMUIR ST. VANCOUVER BC V6B 5R3

Email Address: Sean.Rodrigues@bchydro.com

Telephone No.: 604 699 9004 (Business) _____ (Fax) 604 219 0802 (Cell)

c) A copy of the State of Title Certificate, or a copy of a Certificate of Indefeasible Title, dated no more than 30 days prior to submission of the application must accompany the application as a proof of ownership.

2. **APPLICATION FEE**

An Application Fee as set out in Schedule A shall be made payable to the Village of Pemberton and shall accompany the application.

3. **TEXT AMENDMENT**

(a) Proposed Text Amendment:

PUBLIC UTILITY WORKS YARD.

(b) Section to be amended: _____

4. **PROPERTY TO BE REDESIGNATED**

(a) Legal Description: Lot: 5, Plan: 31658, DL: 203, LLD.

(b) Civic Address: 1363 ASTER STREET.

(c) Property Size: 0.517 ha

(d) Present Designation: C-1 TOWN CENTRE COMMERCIAL

(e) Proposed Designation: M-1 INDUSTRIAL

(f) Existing Use/Development: BC HYDRO FIELD OFFICE

(g) Proposed Use/Development BC HYDRO FIELD OFFICE

(h) Existing Services or Readily Available Services (✓

SERVICES	EXISTING		READILY AVAILABLE	
	Yes	No	Yes	No
Road Access	✓	–	–	–
Water Supply	✓	–	–	–
Sewage Disposal	✓	–	–	–
Storm Drainage	✓	–	–	–

(i) Proposed Water Supply Method: CIVIC CONNECTION. 150ϕ

(j) Proposed Sewage Disposal Method: CIVIC CONNECTION 200ϕ

(k) Proposed Storm Run-off Method: CIVIC CONNECTION 250ϕ

(k) Commencement Date of Project: JANUARY 2018

5. **APPLICATION SUPPORT**

Comments in support of application: REZONING RATIONALE, ARCHITECTURAL DRAWINGS, SITE GRADING, SWMP, AIA, AOA, FCL, TRAFFIC IMPACT, ENVIRONMENTAL PSI.

6. **ATTACHMENTS** (Four sets of plans to be provided)

At the time of providing application and information forms to the applicant, the Director of Development Services shall indicate which of the following attachments are required or not required for this application. The Director of Development Services may require more information.

(a) Architectural Drawing of the exterior of the building (elevations drawings) to a scale of _____ to _____ showing the parcel(s) or part of the parcel(s) to be rezoning and the location of the existing buildings, structures and uses.

REQUIRED: Yes _ **No** _

(b) A dimensional Site Development Plan drawn to a scale of _____ to _____ showing the proposed use, buildings and structures including front, rear, and side elevations, highway access, etc.

REQUIRED: Yes _ **No** _

(c) A Lot Grading Plan drawn to a scale of _____ to _____ if warranted by the topographic condition (of the subject site).

REQUIRED: Yes _ **No** _

(d) A dimensional Sketch Plan drawn to a scale of _____ to _____ of the proposed subdivision, where subdivision (small or large) is contemplated.

REQUIRED: Yes _ **No** _

(e) A dimensional Landscape Plan drawn to a scale of _____ to _____ showing the type and quality of landscaping materials.

REQUIRED: Yes _ **No** _

_____ _____

Applicants Signature Date

FOR OFFICE USE ONLY
Forms duly completed and received

_____ _____

Officials Signature Date

6

BC HYDRO REZONING RATIONALE

28 February 2017

BC Hydro Pemberton Field Building Rezoning Application

For almost 60 years, BC Hydro has been a proud member of the Pemberton community as an employer, a customer, a service provider, a neighbor and a financial contributor. We look forward to continuing a strong and collaborative relationship with the community on this project and those that follow.

Project Drivers

BC Hydro has a commitment to deliver reliable, clean and affordable power to all of our customers. We take this mandate seriously and endeavour to instill these principals in all facets of our business so that we can offer the best possible value to our customers, the rate payers.
Our existing facility was first built in the early 1960's and no longer meets the operational needs of the business. Key issues driving this redevelopment include:

- insufficient indoor and outdoor space;
- poor condition of the buildings including limited structural capacity and building code issues;
- workplace safety concerns, and
- operational challenges that impede timely service to customers.

Site Review Process

The Pemberton field building works in concert with our Whistler, Squamish and Lillooet facilities to support a regional response to operational requirements for a population of approximately 38,000 in the Sea to Sky corridor, Bridge River Valley and Lillooet. Part of this strategy requires BC Hydro to have a presence north of "suicide hill" and south of Mt. Currie so that we can maintain coordinated service through all seasons. While this operational strategy has not changed over the half century, the equipment and technology of power distribution have changed as the needs of the communities we serve along the corridor have also evolved. For example, our trucks are larger, equipment is bigger and our operational requirements and safety standards are more robust.

In addition, our new standards also require our field buildings to remain operational after natural disaster strikes so that we can respond to crises in a timely fashion. Our post-disaster response plan requires that, where possible, our field buildings to be out of the flood plain, out of areas with soils susceptible to liquefaction and away from fractured, talus rock slopes.
Further, in the interest of maintaining high value and affordability for all rate payers, BC Hydro has a defined project budget. This requires a holistic view of all project costs to be measured against risk-value registers.
Following a comprehensive analysis of over fifty potential sites, BC Hydro determined that the existing site best satisfied all of the requirements listed above.

Compatibility with the Neighborhood

Since this office was originally sited and constructed, the Village of Pemberton has updated the Official Community Plan (OCP). The new OCP designates this as a Mixed Use site, requiring buildings in this area to be situated up front on the street with a "zero lot line".
The operations of BC Hydro's field building is a combination of commercial and light industrial activities and not entirely consistent with the intent of the OCP for this site. Recognizing this, the BC Hydro design places the building at the rear of the site, away from the street so as not to

confront the streetscape with large format overhead garage doors which would be out of scale with the street. Instead, BC Hydro is interested in pursuing the development of a landscape design that features an exterior that is more of an aesthetic fit to the existing and future streetscape. The building itself would be screened and recede in the background, therefore maintaining an appropriate scale by giving the landscape design greater prominence.
BC Hydro is also intending to follow Crime Prevention Through Environmental Design (CPTED) principles which is defined as a multi-disciplinary approach to deterring criminal behaviour through environmental design.

Building Design
The new Field Building is designed to the current building code standards for most components but will exceed the current building code to seismically meet the higher standards for Post-Disaster dictated in the next building code. From an energy perspective, the building will be designed to meet an energy intensity of 75kWh/m2/year and shadow LEED™ certification, which also exceeds the current building code requirements.

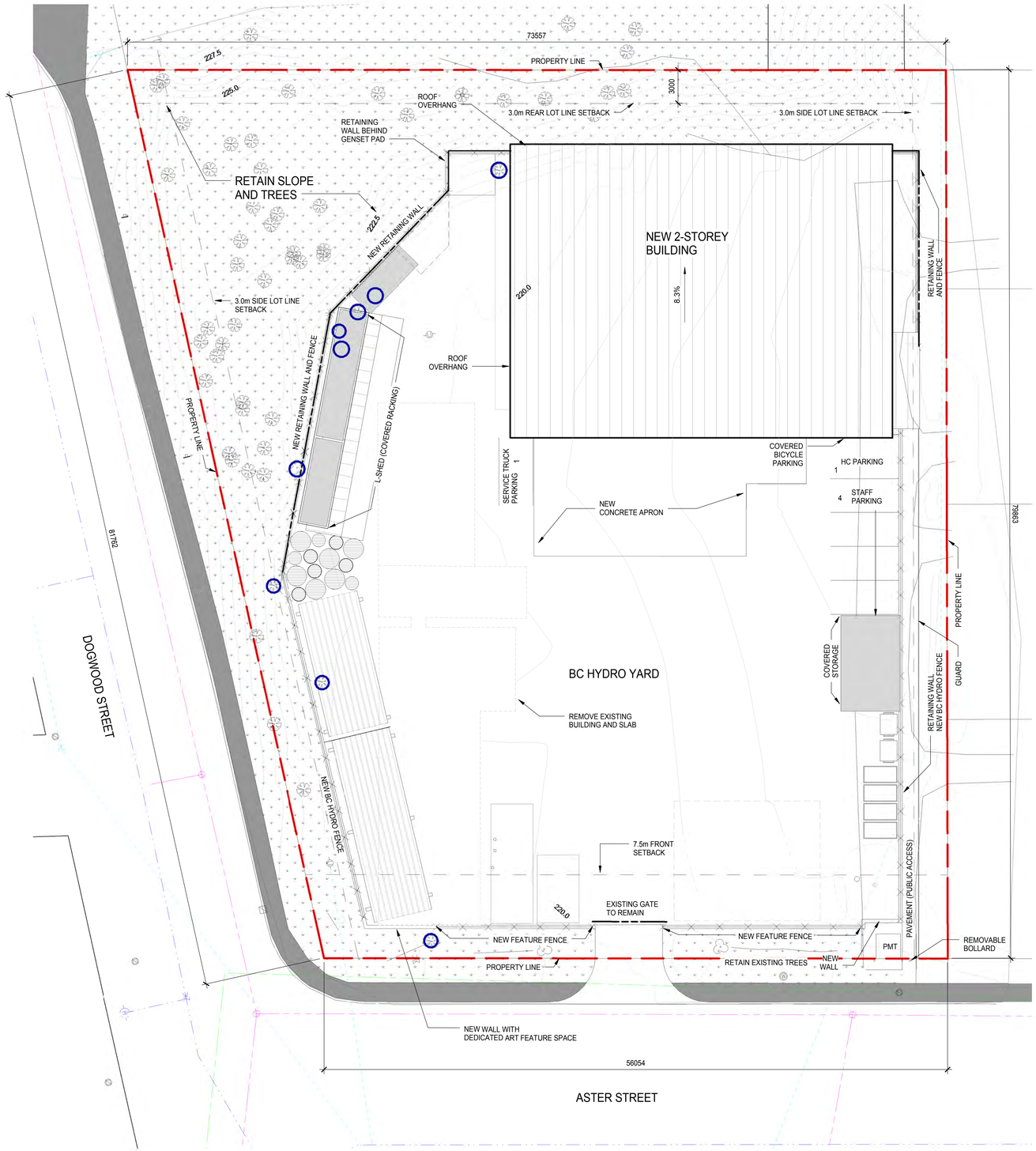
Flood Control Level
In accordance with the OCP and rezoning guidelines, and attached to this application, BC Hydro has conducted a Flood Control Level assessment. This analysis has identified the site to be in the alluvial fan of Pemberton Creek. Meeting the requirements of the 1:500 year flood, the building must be raised to a geodetic elevation of 220.6 meters; an elevation approximately 1m above the Aster Street vehicle entrance. This further supports the desire to place the building at the rear of the site so that vehicles can enter the site.

Storm Water Management
As part of BC Hydro's design, all storm water will be collected and managed on site utilizing a slow percolation cistern in combination with an oil-water separator that recharges the ground water. By not tying into the Village's storm system, BC Hydro is reducing its environmental footprint and its load on the Village's infrastructure.

Traffic Impact
In accordance with the rezoning guidelines and attached to this application, BC Hydro has conducted a Traffic Impact Study. Typical of many of our smaller field buildings, the Pemberton field building has a fulltime crew of 6 people which can increase by 1-3 staff throughout the week. Further, we have changed our operations and have eliminated the delivery of the very large, 100 foot poles to this site. The much shorter 40 and 50 foot poles will continue to be delivered in standard sized trucks. As a result, we will have only 8 parking stalls on the site, deliveries will be made into one of three truck bays and there is no significant impact to existing traffic patterns in the community because all truck manoeuvering can be accommodated off the street and within the site.
As part of the Traffic Impact Study, BC Hydro commissioned its consultant to also review four options for addressing the intersection of Dogwood Avenue and Aster Street put forward by the Village of Pemberton's Planning Department. A copy of this study has been included in our application for further evaluation and discussion.

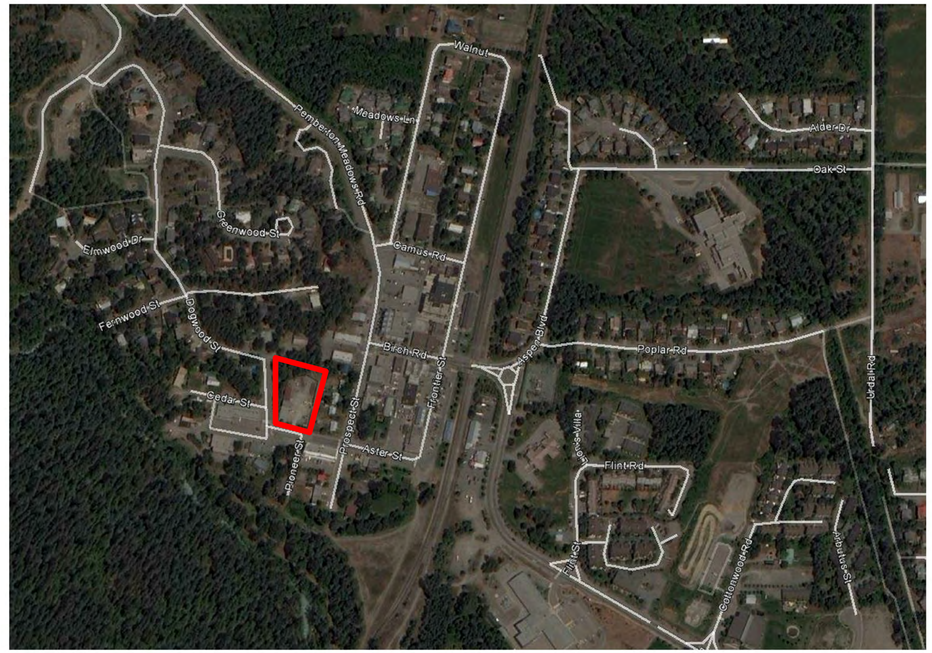
7

ARCHITECTURAL DRAWINGS



SITE PLAN

SCALE: 1 : 200



SITE LOCATION PLAN

PROJECT DATA

PROPOSED ZONING: M-1 INDUSTRIAL
LOT SIZE: 5,174 S.M.

SETBACKS:
7.5m from front parcel line
3.0m from interior side parcel line
3.0m from exterior side parcel line
3.0m from rear parcel line for principal building
3.0m from rear parcel line for accessory structure

BUILDING HEIGHT:

Maximum Height of Principal Building:	10.5 m
Maximum Height of Accessory Structures:	4.5 m
Proposed Building Height:	9.4 m

BUILDING FLOOR AREAS:

Proposed Main Building	956 sm
Level 1 753 sm	
Level 2 203 sm	
Proposed Floor Area Ratio:	18.5% (0.2 FAR)

SITE COVERAGE:

Proposed Main Building (including west canopy)	893 sm
Proposed Transformer Storage	54 sm
Proposed Staging Storage	40 sm
Total Building Area (Coverage):	987 sm
Proposed Coverage :	19%
Maximum Lot Coverage:	50%

PARKING PROVISION:

Workspace/office gross floor area	152 sm
Required stalls (1 stall per 28 sm of gross area)	6
Provided stalls: 6	
H/C PARKING: 1 required	

LOADING PROVISION:

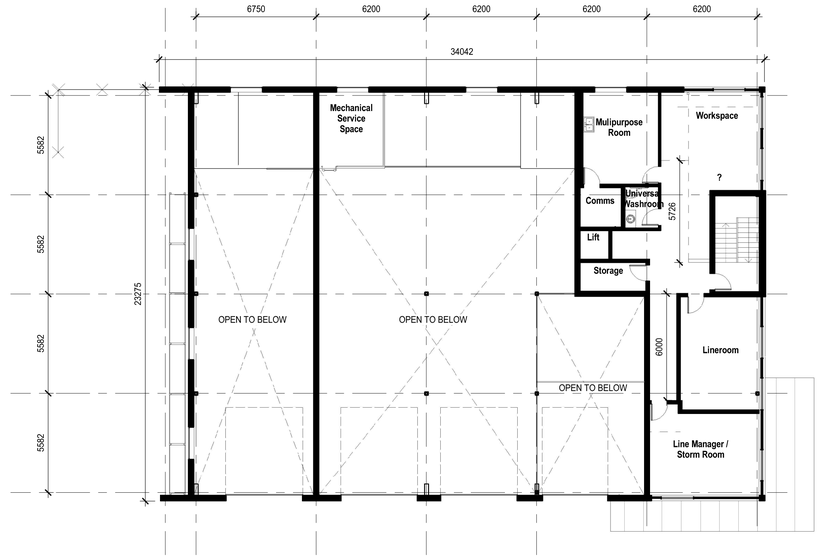
Required Loading	2
(Industrial: 2 for 500 m2 to 2,500 sm of gross floor area)	
Provided Loading Bays (including truck bays)	4

BC Hydro Power smart

REZONING CONTEXT AND SITE PLAN
PEMBERTON BC HYDRO FIELD OFFICE
1363 ASTER ST, PEMBERTON, BC, CANADA

RZ-101
2017-02-20
PROJECT 180283

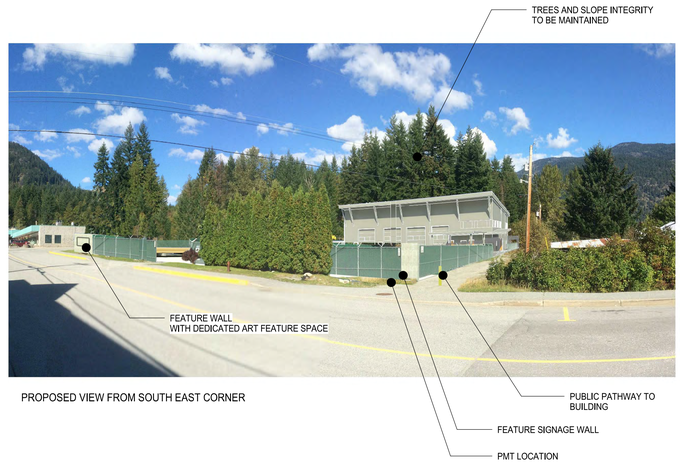
WSP kasian



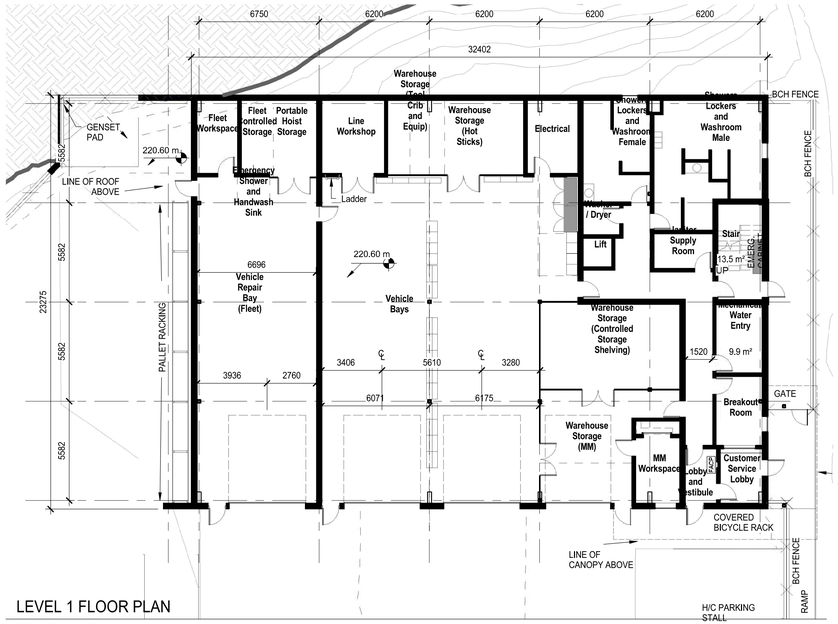
LEVEL 2 FLOOR PLAN

SCALE: 1 : 150

EXISTING VIEW FROM SOUTH EAST CORNER



PROPOSED VIEW FROM SOUTH EAST CORNER



LEVEL 1 FLOOR PLAN

SCALE: 1 : 150

EXISTING VIEW FROM SOUTH WEST CORNER

PROPOSED VIEW FROM SOUTH WEST CORNER

BC Hydro Power smart

REZONING FLOOR PLANS AND CONTEXT PHOTOS

PEMBERTON BC HYDRO FIELD OFFICE

1363 ASTER ST, PEMBERTON, BC, CANADA

RZ-102

2017-02-20

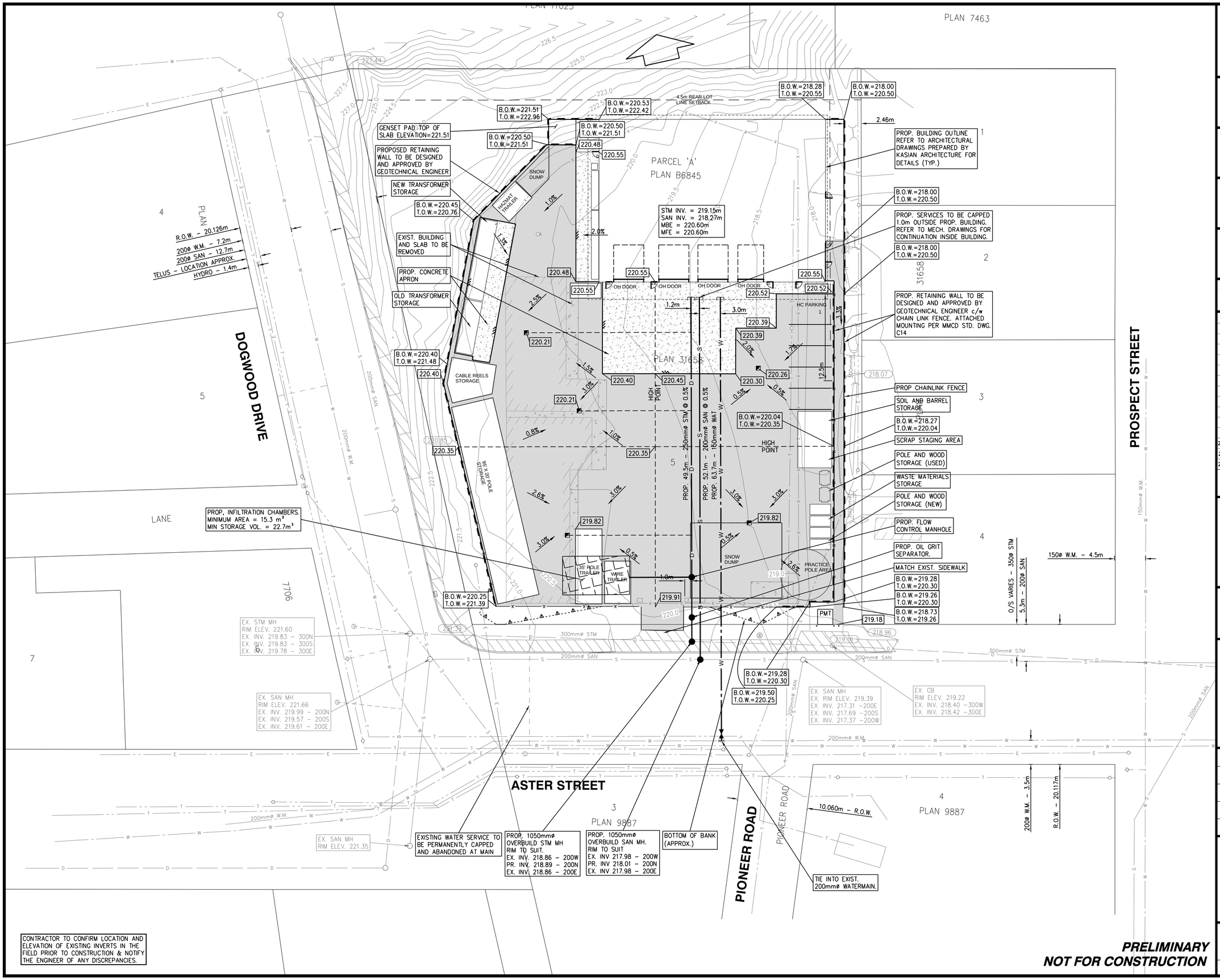
PROJECT 180283

WSP

Kasian

8

PROPOSED SITE PLAN



CONTRACTOR TO CONFIRM LOCATION AND ELEVATION OF EXISTING INVERTS IN THE FIELD PRIOR TO CONSTRUCTION & NOTIFY THE ENGINEER OF ANY DISCREPANCIES.

PRELIMINARY NOT FOR CONSTRUCTION

BENCHMARK:

ELEVATIONS ARE IN METERS AND ARE REFFERED TO GEODETIC DATUM CVD28

SURVEYED BY:

MCELHANNEY ASSOCIATES
LAND SURVEYING
LTD.

CIVIC ADDRESS:

1470 ASTER STREET
PEMBERTON BC
V0N2L1

LEGAL DESCRIPTION:

LOT 5
D.L. 203 LILLOOET DISTRICT PLAN 31658

SCALE:

0 1:250 12m

ISSUED: M/D/Y	REVISION	DESCRIPTION
2017-02-27	2	REVISED SITE PLAN
2017-02-02	1	ISSUED FOR CLIENT REVIEW
2016-11-03	0	ISSUED FOR 50% SCHEMATIC DESIGN

PROJECT:

PEMBERTON BC HYDRO FIELD OFFICE

CLIENT:

WSP CANADA LIMITED

BINNIE
Your Challenges. Our Solutions. Build with Binnie.
R.F. BINNIE & ASSOCIATES LTD.
201 - 40147 Glenalder Place,
Squamish, BC V8B 0G2
TEL 604 892 8222
BINNIE.com

DATE: 10/31/16	SEAL:
DRAWN: SF	
DESIGN: SB	
CHECKED: BL	
SCALE: 1: 250m	

SHEET TITLE:

SITE GRADING PLAN

DRAWING NO.:	REV.
SG	2
RFB JOB No. 16–0906	SHEET 1 OF 3

9

STORMWATER MANAGEMENT PLAN

10

HERITAGE SCREENING TECHNICAL MEMORANDUM

TECHNICAL MEMORANDUM

DATE	5 December 2016		
TO	David Mate	**AMEC FOSTER WHEELER PROJECT #**	VE13507.0056
CC	Sterling Pearce		
FROM	Michael Fox		
RE	Pemberton Field Operations Facility Expansion Heritage Screening		

1 INTRODUCTION & METHODS

This Technical Memorandum presents the results of a desktop Heritage Screening conducted by Amec Foster Wheeler for the Pemberton Field Operations Facility Expansion, located within the town of Pemberton, BC (Figure 1). BC Hydro is proposing to redevelop their facility to include a new main building and out-building covered storage. Preliminary designs were available when this report was written. Ground and vegetation disturbance will be associated with construction activities. The desktop Heritage Screening was undertaken at the request of BC Hydro.

The research for this review assessed site disturbance history and archaeological potential for the project location. Specific research steps included:

- Review of topographic information pertaining to the project location;
- Review of the Provincial Heritage Register via the *Remote Access to Archaeological Data* (RAAD) online application;
- Keyword search of the *Provincial Archaeological Report Library* (PARL) online application;
- Review of Pemberton Field Operations Facility documents provided by WSP (BC Hydro contractor);
- Review of satellite imagery; and,
- Preparation of this Heritage Screening describing methods and results of the research.

Amec Foster Wheeler's professional opinion provided in **Section 3**, below, is based on the above research and sources.

2 RESULTS

Summarized screening results are presented in Table 1.

Table 1. Summary of Heritage Screening Results

Source		Results					
RAAD	**# Arch sites:**	**0.5 km**	1	**# Heritage sites:**	**1 km**	0
		3 km	7		**3 km**	0
		5 km	12		**5 km**	0
RAAD	**Potential Model:**	Squamish Forest District (1997)		**Potential Rating:**	Moderate	
PARL	**# of documents:**	235		**Keywords used:**	Pemberton	
Google Earth ™	**Image Dates:**	2009-2016		**Results:**	Imagery depicts the field operations facility in a mixed rural/commercial setting. A concrete pad added 2013-2015 and periodic yard grading occurs, but no major changes apparent within the substation fence line from 2009 to 2016.	
Street View ™	**Image Dates:**	2016		**Results:**	Imagery depicts the existing field operations facility as being surrounded by a chain-link fence and trees. Terrain has been artificially levelled for the existing facility. Several buildings on western side of the facility, with pole and storage in the northern and eastern sections. There is a gravel alley between facility and residences to the east.	
BC Hydro Topographic Survey Plan	**Plan Date:**	2016		**Results:**	Contour lines indicate terrain within the facility fence slopes gently west-east. Elevated terrain beyond fence to the north and west is present, as are steeper slopes. Depicts two existing buildings and a training pole on the eastern side of the facility. Concrete slabs are located at the access gate and in the southeast corner.	
BC Hydro Schematic Presentation	**Report Date:**	2016		**Results:**	Describes current plans: new main building to have 820 m² footprint, 167 m² outbuilding, and a 550 m² yard. Indicates that site has been partially graded with 5% west-east slope and that natural topography exists on north and west sides. Proposed site plan shows expansion of facility footprint to the west, north and east. Establishment of a paved public access planned on the eastern facility boundary.	

2.1 Terrain Description

The project area is located within the Pemberton Valley, 1.0 km northwest of One Mile Lake, 180 m north of Pemberton Creek, and 1.1 km southwest of the Lillooet River (Figure 1). The area is situated in the Coastal Western Hemlock Dry Submaritime (CWHds1) subzone. Zonal forests in this subzone are characterized by Western hemlock, amabilis fir, Douglas-fir, and western redcedar. However, the area has been logged in the past and is now comprised of immature stands. The BC Hydro property is located on terrain between 217-227 m above sea

level and which consists of elevated terrain in the north and northwest sections overlooking gently sloping terrain to the east.

2.2 Archaeological Resources

Twelve registered archaeological sites fall within 5 km of the project area (Figure 2). The closest is EbRq-14, approximately 265 m to the southeast. EbRq-14 consists of five cultural depressions (housepits, cache pits) located approximately 50 m east of Pemberton Creek. Sites with multiple cultural depressions within 5 km of the project area are strongly associated with aquatic features, such as the Lillooet River and Green River. EbRq-1 (housepits, cache pits) is located approximately 2.4 km southeast of the Project on the left bank of Green River. EcRq-21 (housepits, cache pits, historic structure, historic burial) is on the left bank of the Lillooet River, approximately 4.2 km to the northeast.

Rock art sites consisting of pictographs and petroglyphs are also found in the Pemberton Valley, mainly in elevated terrain where rock outcroppings occur. EbRq-20 and EcRq-17 are both pictograph sites and are located 1.8 km southeast and 3.1 km northeast from the project area. EbRq-15 (petroglyph) is located on steep terrain 4.9 km to the west-northwest.

Culturally modified trees are also present, although the likelihood of any being located in the project area is low due to the presence of immature forest stands. EbRq-18 and EbRq-19 consist of culturally modified trees and one cultural depression located on the left bank of the Lillooet River, approximately 1.4 km to the northwest. EbRq-13 consists of a single culturally modified tree 1.4 km south-southeast of the project area near One Mile Lake. EcRq-18 consists of a culturally modified tree located near two alpine lakes 4.3 km to the northeast. EcRq-30 consists of a single culturally modified tree located in proximity to the Lillooet River 1.8 km to the north-northeast.

EbRq-21 is a subsurface lithic site located approximately 4.1 km to the east of the Project and is located in similar environmental conditions (proximity to a drainage, presence of elevated terrain overlooking lower lying area).

2.3 Archaeological Potential Evaluation/Rationale

The Pemberton Field Office Expansion project area is considered to have moderate potential for undocumented archaeological sites, based on the following findings:

- The project area is located in similar environmental settings to that of known archaeological sites within 5 km, namely valley contexts less than 200 m from a drainage;
- Portions of the project area have not been subject to substantial ground-altering activities by construction of the existing Pemberton Field Office facility, and;
- The area is modeled as having moderate potential on RAAD.

3 RECOMMENDATIONS

This Heritage Screening of the Pemberton Field Office Expansion project shows that there are landscape characteristics associated with moderate archaeological potential present within the project area. It is thus recommended that:

1. An archaeological overview assessment be conducted for this project.

4 DISCLAIMER

The results of this time-limited research and the recommendations made apply exclusively to the specific project area described above. The quality of information, conclusions, and estimates contained herein is consistent with the level of effort involved in Amec Foster Wheeler Heritage Screening services and based on: (i) information available at the time of preparation, (ii) data supplied by outside sources, and (iii) the assumptions, conditions, and qualifications set forth in this document.

This screening is not intended to identify, assess or address traditional land use or other heritage concerns of the First Nations with traditional territories in the study area and should not be relied on for those purposes. This Heritage Screening was written without prejudice to Aboriginal rights and title.

This Heritage Screening was prepared for the exclusive use by BC Hydro and/or consultants acting on BC Hydro's behalf and is intended to be for internal use only. Do not disclose this screening to third parties (including First Nations) without first contacting the Land Program in Environmental Risk Management. The purpose of this Heritage Screening is to assist BC Hydro in determining the requirement, if any, for heritage studies (such as Archaeological Overview Assessment or Archaeological Impact Assessment) for a project or maintenance activity, and the scope of such studies. If any unanticipated archaeological or historical resources protected under the Heritage Conservation Act are encountered prior to or during any maintenance or development activities BC Hydro's Stop Work Procedures must be followed.

We appreciate the opportunity to conduct this desktop archaeological review for BC Hydro. Please contact us if you have any questions about the work completed for this study or the recommendations we have made.

Amec Foster Wheeler Environment & Infrastructure
a division of Amec Foster Wheeler Americas Limited

Prepared by:

Michael Fox, BA.
Archaeologist
michael.fox@amecfw.com

Reviewed by:

Richard Brolly, B.A., RPCA
Senior Associate Archaeologist
richard.brolly@amecfw.com

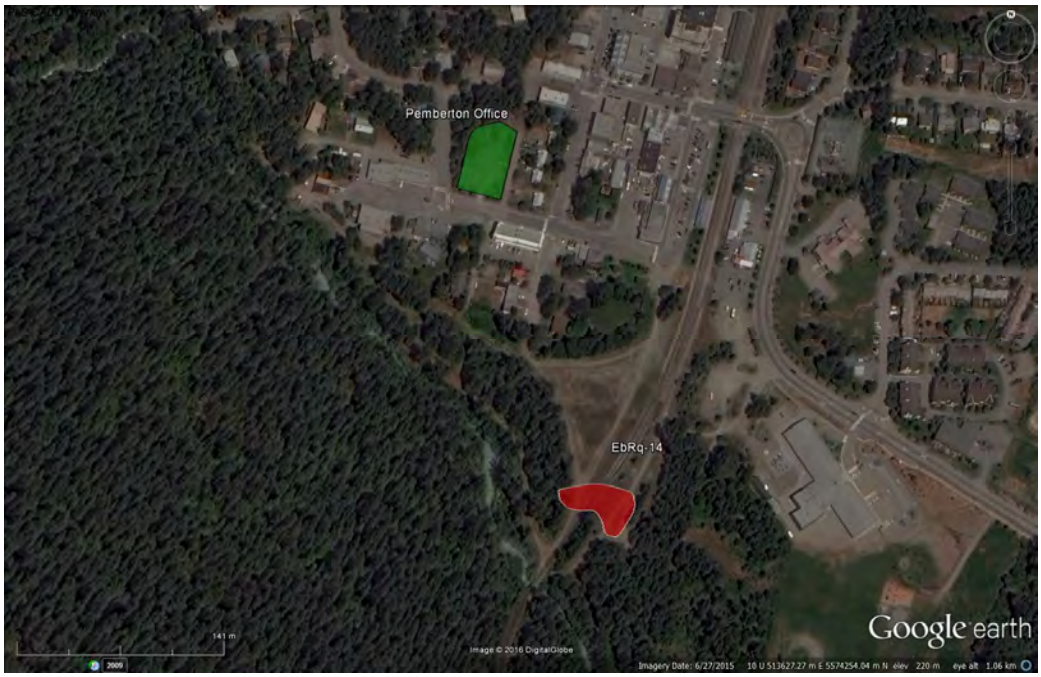


Figure 1. Pemberton Field Operations Facility and surrounding environment (Google Earth)

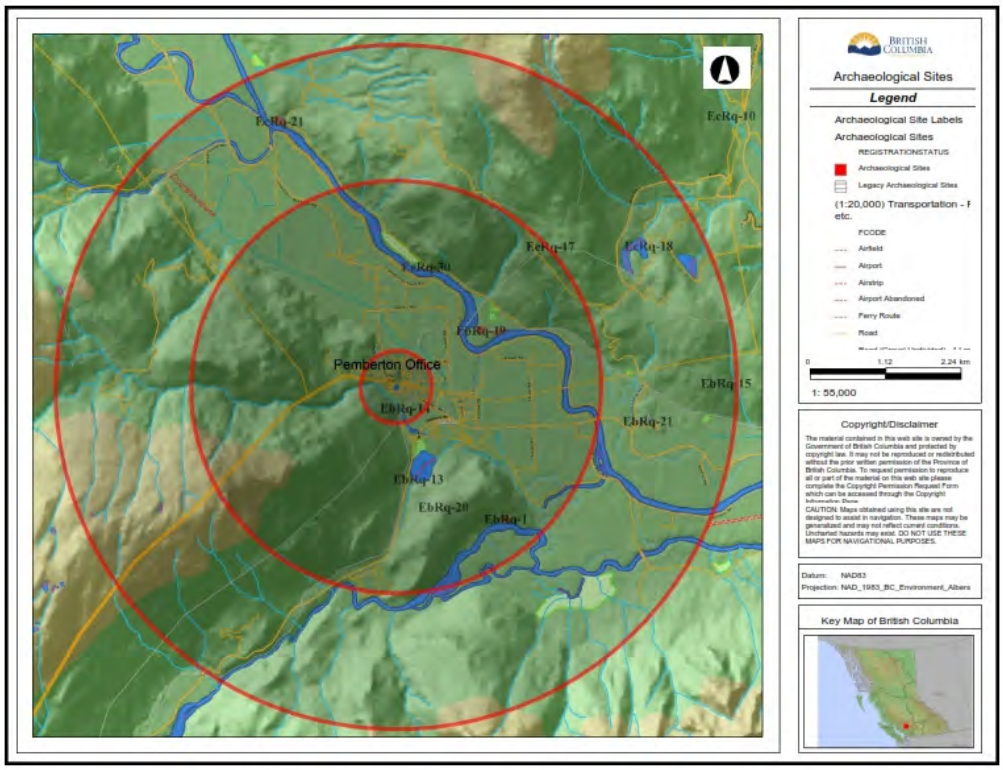


Figure 2. Archaeological sites within 0.5, 3.0, and 5.0 km of the project area (Remote Access to Archaeological Data image)

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ARCHAEOLOGICAL OVERVIEW ASSESSMENT TECHNICAL MEMORANDUM

TECHNICAL MEMORANDUM

To	David Mate		
From	Michael Fox		
CC:	Richard Brolly Sarah Smith Sterling Pearce	**Amec Foster Wheeler File No.**	VE13507.0056
Date	1 March 2017		
Subject	Pemberton Field Operations Facility Expansion Project Archaeological Overview Assessment		

1 INTRODUCTION

This report summarizes the results of an archaeological overview assessment (AOA) conducted by Amec Foster Wheeler on behalf of BC Hydro for the Pemberton Field Operations Facility Expansion, located within the town of Pemberton, BC (the Project).

The purpose of the study is to assess archaeological potential of the subject property and identify any conflicts with archaeological resources in support of an application to rezone the subject property and upgrade existing facilities (e.g., structures, outdoor storage areas). The AOA included a site visit conducted by an Amec Foster Wheeler archaeologist and a representative of the Líl'wat Nation to observe modern landscape integrity on and around the subject property and layout of existing facilities.

1.1 Project Description

BC Hydro is proposing to redevelop their field operation facility located at 1363 Aster Street, Pemberton, BC, to include a new main building (820 m² footprint) and out-building covered storage areas (167 m²). A preliminary design was available when this study was done. The subject property is located in a multi-use commercial-residential area and is approximately 6,320 m². Elevation in the project area varies between 217 and 227 m above sea level.

2 ARCHAEOLOGICAL SITE PROTECTION

Archaeological sites in British Columbia are protected by the *Heritage Conservation Act* (RSBC 1996, c.187). The *Act* states that no site, nor any part of a site, may be altered or disturbed in any way without a Permit issued by the Archaeology Branch (Ministry of Forests, Lands and Natural Resource Operations). Sites are protected by the *Act* whether located on public or private lands. Archaeological sites are protected if they have been designated as "provincial heritage sites" in accordance with Section 9 of the *Act*, or through automatic protection under Section 13 by virtue of particular historical or archaeological values.

Sites automatically protected in BC include:

- Archaeological sites occupied or used before AD 1846
- Aboriginal rock art with historical or archaeological value
- Burial places with historical or archaeological value
- Heritage ship and aircraft wrecks
- Sites of unknown attribution that could have been occupied prior to AD 1846.

Protected archaeological sites may not be altered or disturbed in any manner without a Permit issued under Sections 12 or 14 of the *Heritage Conservation Act.*

3 STUDY OBJECTIVES

The subject of this report represents an AOA as defined in the *British Columbia Archaeological Impact Assessment Guidelines* (Archaeology Branch 1998). According to the *Guidelines*, the objectives of our overview are to:

- Identify lands that have the potential to contain archaeological resources within the project development area.
- Identify potential conflicts between archaeological resources and the proposed development.
- Recommend additional studies or other measures to protect archaeological resources, as required.

Because no archaeological sites were altered during this study and no surface or subsurface inspection was undertaken, a provincial Heritage Inspection Permit was not required for the AOA.

4 METHODS

The AOA research involved the following tasks:

- Background research, involving a review of available heritage documents and biophysical mapping for the project area.
- Search of the Provincial Heritage Register (PHR) via the Remote Access to Archaeological Data (RAAD) online application, to obtain geospatial and other information about documented archaeological and heritage sites in proximity to the project area.
- Search of the PHR via RAAD to ascertain what archaeological potential model(s), if any, are present in the project area.
- A review of historic aerial photographs available for the project area obtained from Geographic Information Centre at the University of British Columbia.
- An assessment of archaeological resource potential based on the in-office research and observations made during a site visit.
- Preparation of a report (this document) describing the results of the assessment.

4.1 Evaluation of Archaeological Resource Potential

"Archaeological resource potential," as defined by this study, refers to the capability of a landscape (or portion thereof) to have supported the kinds of past cultural activities that would have resulted in the formation and preservation of archaeological remains. Some types of cultural activities (e.g., medicinal plant collecting) do not result in the formation of physical remains, and usually cannot be considered when evaluating archaeological potential. The same applies to places of cultural significance (e.g., spirited places); however, where traditional land use data is available, this information can assist with the assessment of archaeological potential.

As used here, potential ratings are not synonymous with probability, which is a quantifiable measure of site occurrence, but simply identify lands that should be examined by qualified archaeologists in advance of land-altering development activities.

Because archaeological site locations are often correlated with particular landscape attributes, their presence or absence can be used to identify lands with greater or lesser archaeological potential. Therefore, the assessment of archaeological potential is based upon a consideration of topographical and biophysical characteristics that favour or inhibit the distribution of archaeological resources (in addition to the locations of documented sites, ethnographic data, and historical settlement information). The attributes considered for this study included:

- Modern and historic vegetation patterns/forest cover
- Soil texture and drainage quality
- Proximity to significant aquatic features (e.g., streams, wetlands, open water)
- Traditional use data
- Proximity of documented archaeological and/or historic resources
- Environmental setting of documented archaeological sites
- Integrity of the modern landscape as a reflection of historic land use practices.

Lands that could be affected by proposed development activities are categorized as having "High", "Moderate", or "Low" archaeological resource potential. The varying classes of potential ratings affect the scope and level of effort recommended as follow-up actions. In general, the higher the potential class, the greater is the level of effort expected by regulatory authorities. For the present study, the potential values are defined as follows:

- **High Potential**: Lands exhibiting topographic and biophysical attributes highly supportive of traditional cultural activities in the past, that would have left archaeological evidence. These lands exhibit the highest archaeological sensitivity within a particular landscape.
- **Moderate Potential**: Lands exhibiting fewer attributes that would have supported traditional cultural activities, than the preceding category.
- **Low Potential**: Lands that exhibit few characteristics supportive of traditional cultural activities. Further field investigations are not recommended for lands categorized as having low archaeological potential.

4.2 Reporting

This report was prepared in accordance with the format outlined in the *British Columbia Archaeological Impact Assessment Guidelines* (Archaeology Branch 1998).

5 BIOPHYSICAL SETTING

Environmental conditions, both past and present, govern the availability of natural resources for human utilization, and as such, are the principle factors determining land use, settlement, and the subsistence patterns of Aboriginal and other peoples. In this section, background information on past and present resource characteristics that may influence human occupation and land use is summarized to provide the framework for assessing archaeological resource potential.

The development location is situated in the Pemberton Valley, approximately 1.0 km northwest of One Mile Lake, 160 m northeast of Pemberton Creek, and 1.1 km southwest of the Lillooet River. While the geology of the Pemberton Valley is complex, Kuurne (1980) indicates that the project area is underlain by gravelly, coarse-textured fluvial sediments that are well drained.

The proposed Project is located within the Eastern Pacific Ranges ecosection of the Pacific Ranges Ecoregion, according to the Ecoregion Classification System used to classify British Columbia's terrestrial and marine ecosystems (Demarchi 2011). Furthermore, the project area falls within the Southern Dry Maritime subzone of the Coastal Western Hemlock biogeoclimatic zone (CWHds1), as defined by Pojar et al (1996).

6 CULTURAL SETTING

6.1 Ethnographic Background

The project area is situated within the Plateau culture area, for which a generalized summary of traditional culture is found in Ray (1939). Specifically, the project is located within the traditional territory of the Líl'wat Nation, which is centered on the Pemberton Valley and Lillooet River. The Líl'wat Nation territory extends from Rubble Creek, located south of the Resort Municipality of Whistler, north to just below Carpenter, Downton and Anderson Lakes, east to Duffy Lake, Little Lillooet Lake, and the Upper Stein Valley, and west to the coastal inlets. The village of Mount Currie, located 30 km north of Whistler and 6 km west of Pemberton, is the present-day home of the Líl'wat people.

The Líl'wat Nation is a part of the larger group of St'at'imc, or Lillooet, people. The St'át'imc is composed of the Upper Lillooet and Lower Lillooet groups, both of which speak slightly different variations of the same language (Teit 1906). This language is an Interior Salish branch of the Salishan linguistic (Boas 1891; Bouchard and Kennedy 2003; Teit 1906). The Líl'wat make up the Lower Lillooet and, today, most Líl'wat people are members of the Mount Currie Indian Band.

Early ethnographic descriptions of the Lillooet were made by Hill-Tout (1978) and Teit (1906). Hill-Tout's focus was on settlement sites and social customs, and he confined himself to describing the villages distributed along the Lillooet-Harrison River system. His ethnography focuses on descriptions of Lillooet customs, beliefs, traditional stories and material culture. There is little to no emphasis as to where on the land the Lillooet were hunting, fishing, trapping and resource collecting.

Teit (1906) provides a broader perspective on land use. Unlike Hill-Tout, he does not map village sites, but rather shows the full extent, as he understood it to be, of the hunting territory. Specifically, Teit notes that the hunting territory of the Líl'wat extended west to the upper reaches of the Squamish River, and the headwaters of the Lillooet River (Teit 1906:196). Teit provides a map illustrating the extent of St'át'imc and Líl'wat territory.

More recent ethnographic work was undertaken by Randy Bouchard and Dorothy Kennedy, who conducted interviews with Líl'wat Elders Charlie Mack, Slim Jackson, and Baptiste Ritchie between 1969 and 1988. This information is presented in *Lillooet Stories* (1977), a collection of traditional Líl'wat stories. These stories provide information about the Líl'wat peoples' ties to the landscape of their traditional territory. The following discussion is based on the work of the above authors.

Lillooet culture was characterized by a semi-sedentary, predominantly egalitarian, lifestyle dependent upon hunting, fishing, and plant gathering for subsistence. The primary socio-economic unit of Interior Salish society was the village group, which consisted of several family groups. Residence was usually with the man's family ("patrilocal") while descent was reckoned bilaterally (Walker 1998). Lillooet villages had a hereditary chief and Teit (1906) states that important resource gathering areas of individual villages were supervised by a "clan chief". The Lower Lillooet also had hereditary resource stewards who "directed the use of specific hunting grounds and some fisheries" (Kennedy and Bouchard 1998:182). Bouchard and Kennedy (1977) state that there was no form of inter-village government.

In addition to economic pursuits, individuals undertook spirit quests throughout this region to acquire guardian spirits. Spirit-quest sites leave little trace of their presence—in comparison to resource exploitation sites like fish-harvesting camps or forest utilization sites—and are thus frequently overlooked by archaeologists. In contrast, transformation sites are frequently highly- visible points in the landscape with ceremonial and/or spiritual significance.

Traditionally, Interior Salish people were fishers, hunters, and gatherers who lived, from early spring to autumn, a nomadic existence in small family groups followed by winter residency at permanent villages in major river valleys. The annual cycle of subsistence activities and settlement locations was dictated primarily by the seasonal availability and abundance of food resources. Low-elevation habitats (e.g., river valleys like the present-day setting of Pemberton) would have been utilized for fishing and as locations both for winter villages and base camps for hunting and gathering of plant foods in adjacent mid and high-elevation environments.

Lillooet people hunted several species of animals as part of their seasonal round. Large game predominantly included wapiti and deer, but black bears, bighorn sheep, and mountain goats would also have been hunted when and where available. Smaller mammals such as rabbits, beaver, ground squirrel, marmot, and porcupine were hunted as opportunity afforded, occasionally as food supplements but more typically for their fur. Birds that were hunted included upland species like grouse and waterfowl such as ducks, geese, and swans.

Fishing was an important activity in rivers, streams, and lakes. Most importantly, the Lillooet River and its tributaries supported anadromous salmon runs that were harvested. In addition, resident rainbow trout, sturgeon, and coarse fish in these waters were also caught, though none were as important as salmon. Fish were trapped or netted in streams and rivers, and fished with

harpoons and hooks in deeper waters. Kennedy and Bouchard (1998) report that the Líl'wat people around Pemberton and Lillooet Lake were less dependent on salmon than the Upper Lillooet who lived around the Fraser River and instead relied more on hunting game.

Many plant resources were utilized by Lillooet people (Turner 1975). The more important food plants include soapberry, saskatoon berry, chokecherry, biscuit root, balsamroot, and avalanche lily, together with numerous other, less-favoured varieties of food plants. Western redcedar, Douglas-fir, and other conifers were utilized for timber and bark, while cottonwood trees growing in riparian settings were used for making dugout canoes. Other plants, such as rushes and tall grasses, were also exploited for artifact manufacture and weaving, and a diverse assemblage of additional species were utilized for medicinal purposes.

Lillooet material culture was typified by tools of wood, bone and antler, and chipped and ground stone. "Fabric" artifacts, such as basketry, tule rush mats, and birch bark containers were also abundant. Dugout canoes were the principal watercraft, and were locally made from red cedar or cottonwood. The bow and arrow was the primary hunting weapon in late pre-Contact times; earlier, darts propelled by throwing-sticks (or "atlatls") and spears would have been used. Game was most often killed from ambush, though deadfalls were used for bears and brushwood enclosures or fences were built to corral deer, and occasionally, bighorn sheep. Trade was also undertaken with interior and coastal groups via well-established trails to obtain resources not available locally.

The traditional winter dwelling was the distinctive semi-subterranean pithouse, which after abandonment and natural infilling, leave sub-rectangular to circular depressions. Small to large village clusters of pithouses were often located near main waterways or fishing stations. However, Teit (1906) indicates that plank houses were also used amongst the Lower Lillooet people in addition to pit houses. According to the Heritage Conservation Branch (1980) "over half of the Pemberton band lived in rectangular, communal plank houses ten to twenty meters long". During other seasons of the year, residence was in lodges, plank houses, and temporary pole-and-tule mat structures called matlodges. Matlodges would usually have been found along lake shores, on the banks of rivers and streams, or associated with seasonal resource harvesting camps. Other constructed features used in the day-to-day life of Lillooet people included hearths, meat-drying racks, storage pits, and food roasting ovens.

A number of authorities have compiled lists of Aboriginal settlements (villages/house-sites and/or seasonal camps) and traditional place names for Pemberton Valley area. Unfortunately, translations of place names were not available at the time of this report's publication. However, one of the places, *Sk,nkenam* or *Sh-KIN-kin-im*, is mentioned in a story recorded by Bouchard and Kennedy (1977). It takes place at a waterfall located 330 m to the west-northwest of the Project on Pemberton Creek and indicates that salmon where caught in the creek and that pithouse dwellings were located in the area. Traditional place names located in proximity to the project area include:

- *Sk,nkenam*
- *Spul'*
- *Snent'*

It is important to note that not all aspects of traditional First Nation cultures are recorded in the anthropological and ethnohistoric literature. Additional knowledge of traditional culture and lifeways still exists in many contemporary First Nation communities. Furthermore, Aboriginal societies underwent significant changes as a result of their contact and engagement with Europeans, and some cultural aspects reported in the literature may not accurately reflect that culture prior to contact.

6.1.1 Historic Background

The earliest contact between the St'át'imc and Europeans was in 1808 with Northwest Company explorer Simon Fraser. Fort Kamloops was established subsequently in 1812 and this lead to increased trade between the Upper Lillooet and Europeans, primarily for dried salmon. However, it was not until 1827 that Lower Lillooet people encountered Europeans as a result of the formation of Fort Langley by the Hudson's Bay Company (Kennedy and Bouchard 1998).

More sustained contact with Europeans began in the late 1850's when gold was discovered in the lower Thompson River area. In 1858, Governor James Douglas sent an exploration party up the Squamish River to find an easier route to the Cariboo Gold Fields. By the 1860's, the development of one route, the Pemberton Trail from Squamish north to Pemberton, facilitated European expansion into the area (Armitage 1997). This resulted in thousands of miners passing through St'át'imc territory, as well as the employment of St'at'imc people as boatmen and packers. This introduced changes to traditional lifestyle, as well as exposure to infectious diseases. Christianity was also introduced during this period as missionaries came into the area. Clashes with miners and other encroaching Europeans led to the formation of Reserves by Governor Douglas starting in 1860. By 1871, at least seven Lillooet Reserves had been created (Bouchard and Kennedy 1998). Farmers also settled in the Pemberton Valley to supply the miners, but it wasn't until the 1920's and 1930's that settlers arrived in greater numbers (Elliot 1977). A cattle trail from Lillooet to the Lower Mainland via Pemberton was established in 1877, but was not often used as it proved a very arduous trail for livestock. Pemberton would remain accessible from Squamish only by trail until the first Pacific Great Eastern (PGE) passenger train in 1914. It wouldn't be until the 1960's that a driveable road was established from the Lower Mainland (Elliot 1977).

6.2 Archaeological Background

An archaeological site is a location that contains physical evidence of past human activity that can be studied by archaeological methods of investigation, including site survey, excavation, and data analysis. Records of archaeological sites in B.C. are maintained by the Archaeology Branch, the provincial government agency responsible for the management of archaeological resources under the *HCA*. Most archaeological sites are attributable to precontact settlement and land use by First Nations' people, though locations of Euro- or Asian-Canadian settlement pre-dating 1940 are often recorded as historic archaeological sites. Local government and municipal heritage committees also record sites, (e.g., structures, streetscapes, landmark trees), and some of these appear in the Provincial Heritage Register.

Archaeological and historical sites are numbered according to the Borden Site Designation Scheme used throughout Canada (Borden 1952). This scheme is based on the maps of the National Topographic System and uses latitude and longitude to define the location of a site. The

four alternating upper and lower case letters (e.g., EfQn) designate a unique "Borden unit" measuring 10 minutes of latitude by 10 minutes of longitude. Sites are numbered sequentially within a Borden unit, based (usually) on their date of discovery; therefore, EfQn-1 would be the first site recorded in the "EfQn" Borden unit.

6.2.1 Archaeological Site Types

Archaeological sites are defined according to the types of archaeological remains (e.g., artifacts and features) present, and according to the types of traditional activities suspected to have taken place. A particular site can be comprised of more than one of these types of archaeological resources and, generally speaking, it is expected that larger sites will be more complex than smaller ones. Typical archaeological resources found in Pemberton Valley environmental settings include:

- **Ancestral Burials:** Burial places are locations that were used by First Nations' people to inter their dead. Through most of prehistory in this region, sub-surface burials at or near village sites were favoured for interments. However, by about 900 years ago, First Nations' communities were mostly disposing of their dead in above-ground settings, which leave few remains for the archaeological record. Between the abandonment of subsurface burial and full-adoption of surficial interment, some aboriginal communities buried their dead in earthen mounds that sometimes covered a stone substructure.
- **Habitation Sites:** Typically comprised of one or more circular to sub-rectangular housepit depressions, the remains of semi-subterranean pit houses. Archaeological site EbRq-14 is located approximately 265 m southeast of the project area and consists of five cultural depressions (housepits, cache pits). Village sites frequently include smaller pits used for food preparation and storage, burials, and the remains of activities undertaken outside the houses, including deposits of rubbish removed from the houses, butchered animal bones, and the waste products of stone tool manufacture. Villages are usually found in environmental settings characterized by good solar exposure, protection from winter winds, and proximity to potable water, though very secluded locations were sometimes selected as defensible positions.
- **Artifact scatters:** These sites are usually comprised exclusively of artifacts, mostly made of stone, representing transitory occupation of riparian or inland environmental settings, oriented toward the exploitation of particular resources. The most common archaeological remains at such sites are chipped or ground stone tools, along with the waste products of tool manufacture ("debitage"). Fire-altered rocks and localized spreads of charcoal and ash from cooking fires are sometimes present.
- **Ceremonial/Spiritual Sites:** A class of cultural heritage sites that may or may not contain physical evidence of past land use, but are nevertheless of considerable importance to contemporary communities. They include: (i) **Transformer sites**, which are "stone people" (e.g., prominent boulders) or places associated with the actions of the Transformers; (ii) **spirited places**, or those which are inhabited by spirits; (iii) **ceremonial sites**, places or locations which are important to past and present ceremonial life, and; (iv) **cultural resource sites**, or places where materials used for ceremonials or spiritual activities are collected.

- **Trails:** Represent traditional routes used by Aboriginal people for access to resource-harvesting areas and for long-distance trade and communication with neighbouring First Nations. Many traditional trails became historically known routes during the colonial period and were used later still for contemporary roads. CMTs and rock art sites are characteristically found within a short distance of traditional and more recent trails.
- **Forest Utilization Sites:** These sites consist of one or more culturally modified trees (CMTs), which have been intentionally altered by First Nations' people as part of their traditional use of the forest (Archaeology Branch 2001). Examples include trees with scars from bark stripping, stumps and felled logs, trees tested for soundness, trees chopped for pitch, and trees delimbed for firewood. The majority of CMTs will occur within about 300 m of a major watercourse, on level ground or hillsides with less than a 50 degree slope, and in mature forest stands. Remnants of aboriginally-logged trees, particularly stumps, may be found in settings which were logged in historic times. The likelihood of any being located in the project area is low due to the presence of immature forest stands.
- **Historic Sites:** These sites are comprised of post-contact remains, including artifacts, structures, and features of Euro-Canadian or Asian-Canadian manufacture, and denote settlement and land use in the historic period.
- **Rock Art:** Locations where First Nations' people painted designs (pictographs) in red ochre on bedrock faces or upon large boulders. Typically found on bedrock outcrops or large boulders, often along steep shorelines and traditional trails, or at locations of strong spiritual significance to First Nations' people. The nearest recorded pictograph site, EbRq-20, is located 1.8 km southeast of the project area.

6.2.2 Regional Cultural Chronology

The project area situated in a setting transitional between the Northwest Coast Culture Area, which encompasses the west coast of North America, from southeastern Alaska to southern Oregon (Matson and Coupland 1995; Ames and Maschner 1999), and the Interior Plateau Culture Area, which includes lands between the Coast Mountain and Rocky Mountain Ranges, from the Chilcotin-Cariboo plateaus to northeastern Oregon-central Idaho (Chatters and Pokotylo 1998). Recent summaries of Northwest Coast prehistory are Ames and Maschner (1999), Matson and Coupland (1995), and Mitchell (1990). Comparable studies for the Plateau include Richards and Rousseau (1987), Pokotylo and Mitchell (1998), Stryd and Rousseau (1996), Prentiss and Kuijt (2004), and Rousseau (2004).

The pre-Contact cultural (archaeological) sequence for southwestern BC is based on archaeological site investigations along the lower Fraser River and the southern Strait of Georgia, as well as research in the Squamish-Pemberton corridor and on to Lillooet. This archaeological research has recovered evidence for nearly 10,000 years of human occupation in both regions. This evidence has been organized into a sequence of archaeological periods on the Coast and Plateau (Table 1 & 2). Each archaeological period is marked by distinctive artifact styles and technologies, as well as inferred economic, social, and other cultural traits.

The prehistory of the lower Squamish Valley seems to resemble a localized sequence developed for the Fraser Canyon (e.g., Mitchell 1990), and most archaeologists would agree that sites in the Lillooet River Valley should exhibit a mix of coastal and interior characteristics.

The archaeological periods of the Strait of Georgia – Squamish Valley region, from oldest to youngest, are named **Old Cordilleran** (9000-5500/4500 BP), **Charles** (5500/4500-3300 BP), **Locarno Beach** (3300-2400 BP), **Marpole** (2400-1000 BP) and **Gulf of Georgia** (1000-200 BP) culture types. These terms primarily refer to coastal cultures, whose relationship to those of the lower Squamish Valley is somewhat unclear.

The Interior Plateau sequence begins with an unnamed early tradition that appears to represent a mixture of early periods from surrounding regions, including the coastal **Old Cordilleran** culture type, then progresses to the **Nesikep Tradition** (7000-4500 BP), which is followed by the **Lochnore Phase** (4500-3500 BP), and then the **Plateau Pithouse Tradition**, divided into the **Shuswap** (3500-2400 BP), **Plateau** (2400-1200 BP), and **Kamloops** (1200-200 BP) horizons. All three horizons are represented in cultural materials recovered from archaeological excavations throughout the Interior Plateau (Richards and Rousseau 1987; Sanger 1970), including the few investigated sites in the Lillooet River valley (e.g., Hudson and de Paoli 1999; Witt 2001). Both Interior and Coastal cultural sequences are terminated at AD 1800, after which, it is usually agreed, European culture came to influence First Nations' cultures throughout southwestern BC

Table 1: Archaeological Culture Types of the Southern Strait of Georgia Region

Culture Type	Dates*	Cultural Characteristics (selected)
Old Cordilleran	9000 to 5500/4500 years BP	• initial adaptation to marine coastal environments • terrestrial resources are more important than later times • shellfish and sea mammals locally important; salmon and eulachon were caught but not yet dominant • no evidence for ranked social organization • no evidence of permanent villages
St. Mungo	5500/4500 to 3300 years BP	• fully adapted to marine coastal environments • very localized evidence for ranked social organization • localized evidence for intensive harvesting of salmon and herring; inferred presence of resource storage • permanent houses present in the central Fraser Valley • burials in middens widespread
Locarno Beach	3300 to 2400 years BP	• large permanent villages and plank houses absent or at least rare • ascribed status may occur; achieved status widespread; head deformation used to denote social standing • resource mass-harvesting and food storage widespread
Marpole	2400 to 1000 years BP	• large, permanent villages widespread • plank houses present • ascribed status present (but localized); achieved status widespread • long-range trading networks present • salmon is most important food resource at this time
Stselax	1000 years BP to ca. 150 years BP	• ethnohistoric village pattern established • artifacts identical or similar to those used by ethnographic Coast Salish communities • subsistence activities identical to those recorded by ethnographers • switch from midden to mound burials, then to surface burials
Historic (Ethnographic) Period	About 150 years BP to present	• gradual abandonment of traditional house styles and artifact types • adoption of European house styles and tools • subsistence activities become oriented to European cash economies
* Following scientific convention, dates are expressed as radiocarbon years BP (Before Present), where present = AD 1950		

Table 2: Archaeological Culture Types of the Interior Plateau Region

Culture Type	Dates*	Cultural Characteristics (selected)
Early	10,000 - 7000 BP	• associated with warmer/drier environmental conditions • subsistence pattern characterized by a reliance on hunting and a broad foraging spectrum with increasingly-efficient exploitation of small animals and plants • often associated with mid-elevation Holocene grassland environments • low-elevation valley settings away from rivers and lakes would have been extremely arid, and some modern game species may have been absent, though bison and perhaps pronghorn antelope were present (predominantly to the SE) • no evidence for social ranking • no evidence of permanent villages or habitation structures
Middle	7000 - 3500 BP	• coincides with onset of cooler, moister conditions • correlated with the 6800 BP ashfall from Mt. Mazama (Westgate *et al.* 1970) • subsistence was still based primarily on hunting game animals and gathering plant foods, although salmonid populations available in some watersheds, freshwater mussels are more important in sites of this age than at later times (Prentiss and Kuijt 2004). • Lochnore Phase represents a riverine-adapted society able to exploit stabilized salmon populations • no evidence for ranked social organization • no evidence for presence of resource storage • a few permanent houses known (e.g., South Thompson River valley) • a few burial places known, but rare
Late	3500 - 200 BP	• Plateau Pithouse Tradition represents a more sedentary way of life focused on resource mass-harvesting and systematic food storage subsistence activities identical to those recorded by ethnographers • semi-subterranean pithouse in general use as winter residence • matlodges may begin to replace pithouses in latest pre-Contact times • permanent villages present, some of large size (especially around Lillooet) • artifacts identical or similar to those used by ethnographic communities • long-range trading networks present • achieved status widespread; localized evidence for ascribed status (Lillooet) • burial places within pithouse floors (Shuswap Horizon), prominent landscape features, talus slopes (winter interments), occasionally within cairns or cists
Historic (Ethnographic) Period	About 150 years BP to present	• gradual abandonment of traditional house styles and artifact types • adoption of European house styles and tools • subsistence activities become oriented to European cash economies
* Following scientific convention, dates are expressed as radiocarbon years BP (Before Present), where present = AD 1950		

6.2.3 Previous Archaeological Research in the Project Area

The first site inventory survey in the Lillooet River valley was conducted by Paul Sneed and Mary-Margaret Smith (Archaeological Sites Advisory Board) in the mid-1970s (Sneed and Smith 1977). Most archaeological studies in this region have been conducted in the context of development-driven impact assessments, typically for BC Hydro transmission and run-of-river hydroelectric developments (e.g., Bussey 1992; Campbell and Witt 2000; Witt 2002, 2003a), forestry operations (e.g., Witt and Howard 1998, 2000), and local infrastructure/residential developments (e.g., Quirolo and Hudson 1996; Hudson and de Paoli 1999; Witt and Hall 1999; Witt 2003b). The Líl'wat Nation, through its subsidiary Creekside Resources, has carried out a considerable number of cultural heritage studies throughout traditional Líl'wat lands (e.g., Hall 2002; Creekside Resources 2003).

7 ARCHAEOLOGICAL OVERVIEW RESULTS

Documentary research included a review of: (i) modern and historic vegetation information; (ii) soil characteristics; (iii) proximity of project area to aquatic features; (iv) ethnographic and archaeological literature, as well as databases, and; (v) the landscape integrity of the subject property. Information pertaining to biophysical, topographical, and hydrological information is presented in Section 5. Information pertaining to the pre-Contact land use patterns through the review of traditional use and ethnographic data is described in Section 6.1 and Section 6.2. Results of the review are summarized in Section 7.1 and evaluated in Section 7.5.3.

7.1 Previously Recorded Archaeological Sites

According to the PHR, there are 12 recorded archaeological sites within 5 km of the project area (Table 3; Figure 1). The closest site (EbRq-14) is approximately 265 m to the southeast. EbRq-14 consists of five cultural depressions (housepits, cache pits) located approximately 50 m east of Pemberton Creek. Sites with multiple cultural depressions within 5 km of the project area are strongly associated with aquatic features, such as the Lillooet and Green Rivers.

Table 3: Recorded Archaeological Sites within 5 km of the Subject Property

Site	Site Type	Date Recorded	Comments
EbRq-1	Habitation Feature	1965	2 housepit depressions and 6 other cultural depressions.
EbRq-13	Culturally Modified Tree	1997	Rectangular bark-stripped cedar tree.
EbRq-14	Habitation Feature	1999	3 housepit depressions and 2 cache pit depressions.
EbRq-15	Petroglyph	2003	Two anthropomorphic designs.
EbRq-18	Cultural Depression; Culturally Modified Tree	2008	1 cache pit and 5 CMTs.
EbRq-19	Culturally Modified Tree	2008	4 CMTs (2 bark-stripped, 1 sap collection, and 1 kindling collection).
EbRq-20	Pictograph	2008	1 panel.

Site	Site Type	Date Recorded	Comments
EbRq-21	Subsurface Lithic Scatter	2009	Stone artifacts (flakes, biface).
EcRq-17	Pictograph	1997	5 panels.
EcRq-18	Culturally Modified Tree	1997	2 bark-stripped CMTs.
EcRq-21	Habitation Feature; Historic Material; Human Remains	2000	6 housepits and 2 cultural depressions; 1 post-contact cemetery; 2 historic cabins.

7.2 RAAD Potential Modelling

The project area is covered by the Squamish Forest District Potential Model (Millennia 1997) and indicates that it is located within terrain with a moderate potential rating for habitation sites.

7.3 Historic Sites and Properties

No protected historic sites or properties will be affected by the proposed development or are located within 5 km of the subject property.

7.4 Historical Aerial Photograph Interpretation

Aerial photographs supplied by the Geographic Information Centre (Department of Geography, UBC) portray land use in the vicinity of the BC Hydro Pemberton Field Facility since 1947. The examination of air photos taken over seven decades was undertaken to identify historic disturbances that occurred in the project area and assess the landscape integrity of the proposed development area. Table 4 summarizes the results of the historic aerial photograph review.

Table 4. Pemberton Field Operations Facility - Historic Aerial Photograph Interpretation.

Flight : Frame	Date	Observations
BC 409: 23	1947	• Project area appears to be part of a rural settlement. Buildings may exist on subject property. • Pacific Great Eastern railway (PGE) right-of-way visible to the east. • Pemberton town site established. • Pemberton-Squamish trail visible. It trends north from Pemberton Creek through or close to the subject property and terminates at the Pemberton Meadows road, which is now the intersection of Prospect Street and Birch Road.
BC 1272: 79	1950	• One residence and two outbuildings visible in proximity to the subject property, which is partially cleared. • Pemberton-Squamish trail visible and appears to pass through the subject property at east side of residence. • P.G.E. “wye” moved from east to west side of tracks. • Dirt road in the present location of Aster Street.
BC 2431: 92	1958	• Residence and outbuildings in project area no longer extant.

Flight : Frame	Date	Observations
		• Two large buildings present side-by-side on the western portion of the subject property. The eastern building appears to be in the present location of the BCH field facility's southeastern-most building. • Two smaller buildings present on the eastern portion of the lot. The western and eastern building clusters are separated by a large open space. • Aster Street better developed; St. David's Lane and Dogwood Street present. • More clearing of trees in the northern portion of the subject property. Heavy equipment or large trucks may be present. • Residences are located east of the subject property.
BC 4071: 137	1962	• Majority of trees cleared on subject property, except in vicinity of northern property boundary. • Dogwood Street and Aster Street do not appear paved, but are wider. • A structure or a log decking area present in northern portion of the subject property.
BC 5316: 139	1969	• Western-most building within the subject property removed and replaced with a structure northwest of the remaining building. • Large vehicles or heavy machinery present. • Roads surrounding the subject property appear paved.
BC 5655: 085	1975	• Structures on the subject property close to modern configuration of Field Office Facility. • Large piles of gravel or fill present east of facility buildings. • Buildings that were on eastern subject property boundary no longer present. Storage sheds may be located in southeastern portion of subject property. • Logs or power poles stacked in north portion of subject property. • Additional clearing and landscaping on western and northeastern areas of subject property.
BC 81117: 1	1981	• Minimal change since 1971. Imagery poor. • Logs or power poles no longer present within subject property. • Field Office Facility yard lighter in colour. Likely piles of gravel or fill observed in 1975 imagery were used to level the yard.
BC 86066: 238	1986	• Little change in subject property discernible. • Logs or power poles stacked in northeastern area of Field Office Facility.
30BCB 90106: 3	1990	• Vegetation growing on perimeter of Field Office Facility. • A pad or fenced area present in north section of Field Office Facility where hydro poles were stockpiled in 1986.
30BCC 94157: 122	1994	• Site nearly in modern configuration. • Hydro poles stockpiled at north end of Field Office Facility.
30BCC 05086: 106	2005	• Subject property in modern configuration. New building installed on eastern portion of Field Office Facility or roof of an existing building replaced. • Field Office Facility fenced. • Various open storage areas of materials or equipment visible.

7.5 Assessment of Archaeological Potential

7.5.1 Modern and Historic Vegetation Patterns

No reports discussing native vegetation within the project area were located, though the aerial photograph review permits a degree of interpretation. The native vegetation has been modified by over 120 years of Euro-Canadian settlement and urban development. In 1947, the area north

of Pemberton Creek and west of the Pemberton town site is largely undeveloped. Some rural development is present and the review of historic aerial photographs indicated the subject property had been partially cleared of forest cover by then (see Section 7.4; Table 4). Biophysical data for this area indicates that the dominant species would have been Douglas-fir, western hemlock and western redcedar. Modern vegetation cover within the subject property consists of regrowth fir, cedar, spruce, alder and willow (Photos 1, 4 & 5). Ground vegetation was not identifiable during the January 2017 site visit due to snow cover.

7.5.2 Proximity to Aquatic Features

The subject property is located 160 m northwest of Pemberton Creek, 1.0 km northwest of One Mile Lake, and 1.1 km southwest of the Lillooet River (Figure 1). Archaeological sites in the vicinity of the Project, particularly cultural depressions, are strongly associated with aquatic features such as creeks and rivers.

7.5.1 Soil Texture and Drainage Quality

Surficial geology mapping for the Pemberton Valley indicates that native soils within the project area are gravelly, coarse textured fluvial sediments that are well drained (Kuurne 1980). This suggests that the project area is located in well-drained terrain, a setting with which archaeological sites are most often associated.

7.5.2 Documented Traditional Land Use Patterns and Cultural Geography

Many traditional settlements and geographic place names are recorded from the Pemberton Valley, three of which are located in proximity of the project area (Creekside Resources 2003). The proximity of the Pemberton-Squamish Trail may also indicate the potential importance of the project area to First Nation communities in the past.

7.5.3 Proximity and Environmental Setting of Documented Heritage Resources

Twelve documented archaeological sites are recorded within 5 km of the subject property. Table 3 identifies the types of archaeological sites recorded near the subject property. Of the twelve sites recorded, nine are located in proximity (~200 m) to major waterways on elevated, well-drained terrain, similar to the terrain within the subject property.

7.5.4 Integrity of the Modern Landscape as a Reflection of Historic Land Use

Landscape integrity is considered to be the most critical variable for assessing archaeological resource potential within the project area. The BC Hydro Pemberton Field Operations Facility is located in a commercial-residential setting. The footprint of the project has been affected by land clearing associated with settlement since at least 1947. As indicated by the aerial imagery, disturbance may have occurred prior to 1947 from the Squamish-Pemberton Trail, although resulting landscape alterations would have been minimal. The most significant alterations to the property have occurred since 1950, after which time the project area appears to have been used as an infrastructure yard. Subsequent clearing, grading, construction and road improvements would have also impacted the integrity of the landscape. BC Hydro design plans available indicate that terrain outside of the current Field Office Facility fence represents the natural landscape.

7.5.5 Site Visit

A site visit was conducted on 26 January 2017 by Amec Foster Wheeler archaeologist Michael Fox accompanied by Lex Joseph, a representative of Líl'wat Nation. The site visit confirmed that the majority of the subject property is currently being used as a BC Hydro Field Office Facility. The facility's yard has been partially graded, capped with gravel fill and has a gentle east aspect slope (Photo 1 & 2). The level of disturbance to native sediments within the yard is difficult to assess. Two structures are located on the west margin of the yard and several open air storage areas are present. East of the fenced yard is St David's Lane and residences located on a gentle east aspect slope (Photo 3). In the southwest portion of the subject property, generally level terrain is bounded by the facility buildings and the toe of a steep east aspect slope extending from Dogwood Street (Photo 4). In the northwest, the steep slope from Dogwood Street is broken by a level bench. The bench is bounded to the north by a rocky outcrop and to the west by moderate-steeply sloping terrain with a south aspect. The bench is well defined, elevated 2 m above the Facility, and is approximately 10 m wide at its widest point (Photo 5). This bench is similar to other landforms on which archaeological sites have been identified within the Pemberton Valley. A historic concrete structure is present on the bench, built into the rocky outcropping (Photo 6). Another bench is also present northeast of the facility yard, but is less well-defined, sloping and outside of the BC Hydro property (Photo 7).

During the site visit, Lex Joseph, the Líl'wat representative for this work, indicated that an unrecorded cultural depression (a small housepit or a roasting pit) was destroyed with the construction of the RCMP detachment approximately 110 m southwest of the subject property. The detachment is located on similar terrain to the Facility in that it is gently sloping, elevated and within 200 m of Pemberton Creek.

8 RESULTS SUMMARY

The desktop research and the 26 January 2017 site visit conducted for the AOA of 1363 Aster Street (the subject property) determined that areas of low and moderate archaeological potential are present. The subject property is located in an area modeled as having moderate archaeological potential for habitation sites and has landscape characteristics similar to that of recorded archaeological sites within 5 km (Millennia 1997; Section 7.1; Table 3). The historic aerial photograph review indicated that the Pemberton-Squamish Trail likely passed through or close to the subject property and that, by 1947, the subject property had at least been partially cleared by homesteading. The construction of structures, grading and clearing of the subject property has occurred sporadically until the present, with some areas subject to greater disturbances than others (Section 7.4; Table 4). The locations of the existing Field Operations Facility structures are considered to be low potential as they have been more extensively disturbed than the rest of the subject property. Moderate potential exists in areas that do not have structures located on them like the proposed location of the new facility building and the bench located in the northwest corner of the subject property (Figure 5).

9 RECOMMENDATIONS

This archaeological overview assessment of the Pemberton Field Operations Facility Expansion shows that there are landscape characteristics associated with low and moderate archaeological potential within the BC Hydro Pemberton property. The site visit occurred in winter conditions with snow present and therefore a surface inspection for cultural material was not feasible. Based on the results of the AOA and observations made during the site visit, it is recommended that:

1. A review geotechnical reports by undertaken, if available, to determine if native soils with the potential to contain archaeological materials or deposits are present.
2. A pre-construction archaeological impact assessment (AIA) be undertaken in snow free conditions of moderate potential terrain located outside of the Field Operations Facility fence line to identify any archaeological resources that may be present.
3. Depending on the results of the pre-construction AIA, monitoring and spot-screening of excavated sediments may be required concurrent with construction of the Pemberton Field Operations Facility to identify any archaeological materials that may be present.

10 DISCLAIMER

Information on archaeological resources and resource potential in the proposed development area presented in this report are based on a review of relevant documents, a search of relevant databases housing recorded sites-specific data, an historical aerial photograph review, and a field visit. Efforts were made to verify the accuracy of the data produced or provided by others and extracted from the literature and databases.

This assessment of archaeological potential is based on current understanding of the distribution of archaeological resources (sites and artifacts) in the general project area. Amec Foster Wheeler acknowledges that data and interpretations which shape the understanding of the archaeological record continues to be produced, and that as such, ideas about site locations and distribution may change over time.

The findings and conclusions documented in this report have been prepared for the specific application to this project, and have been developed in a manner consistent with that level of care customarily exercised by archaeological professionals currently practising under similar conditions in this region. This study was conducted without prejudice to First Nations treaty negotiations, Aboriginal rights, or Aboriginal title. Participation by Aboriginal communities in this study does not indicate support of the proposed development by those communities.

We trust that this report has provided you with the information you require. If you have any questions or comments, please contact Richard Brolly at 604-295-8246 or richard.brolly@amecfw.com.

Amec Foster Wheeler Environment & Infrastructure
a division of Amec Foster Wheeler Americas Limited

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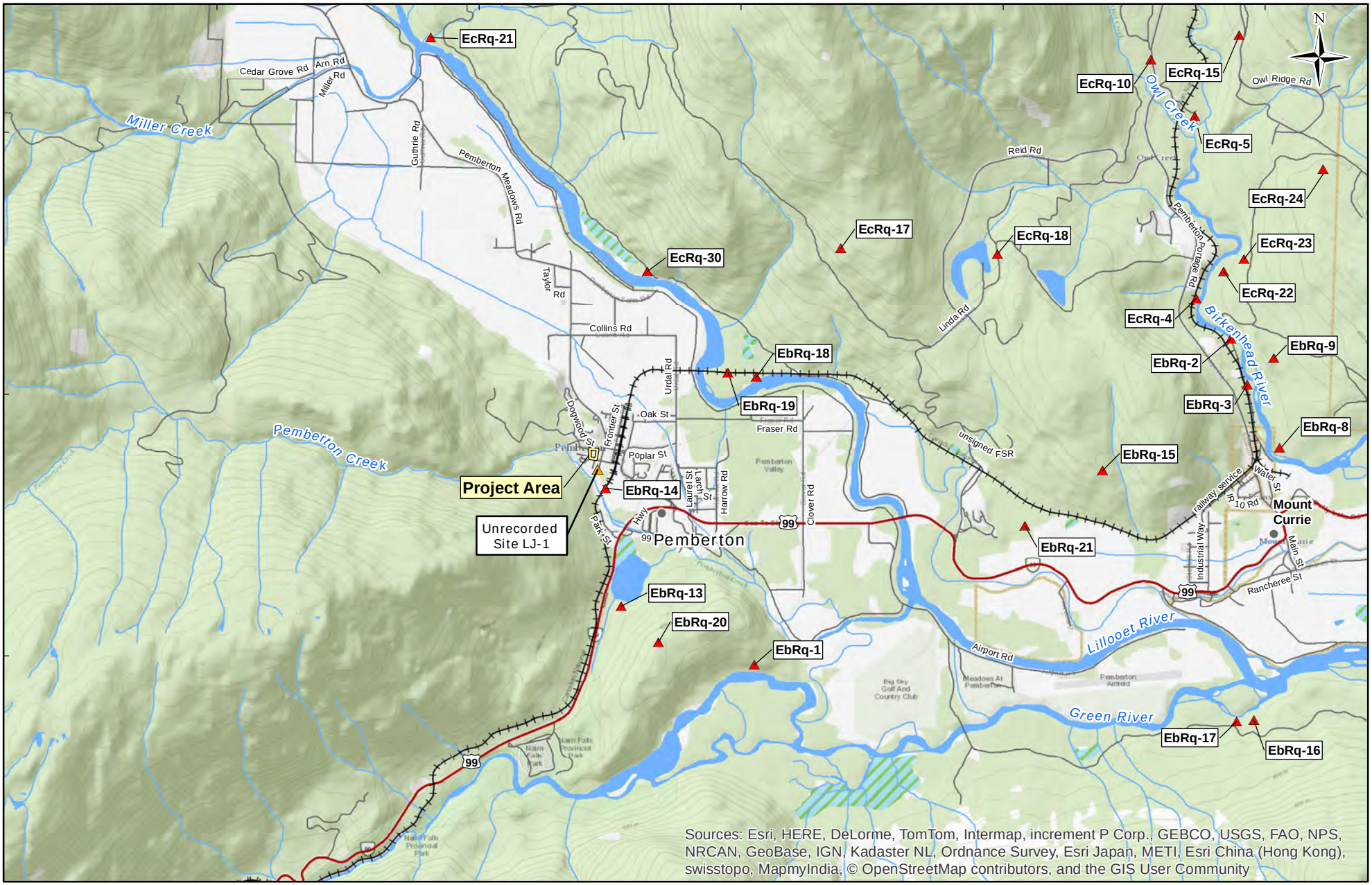

Legend

- Project Area
- Unrecorded Site LJ-1
- Previously Recorded Archaeological Site
- Populated Place
- Railway
- Road
- Highway
- Watercourse
- Waterbody
- Wetland

0 0.5 1 km

Scale 1:50,000

References:
DataBC Data Distribution Service
Open Government License
(http://www.data.gov.bc.ca/)
Geogratis/Geobase
Open Government License - Canada
(http://data.gc.ca/eng/about-datagcca)
MFLNRO - Archaeology Branch
Archaeological Sites RAAD
(Remote Access to Archaeological Data)

CLIENT: BC Hydro Power smart

TITLE: Project Area and Proximity to Recorded Archaeological Sites

PROJECT: Pemberton Field Operations Facility Expansion Project AOA

DATE:	ANALYST:	QA/QC:	
February 06, 2017	RDM	MF	**Figure 1**

Fig_1_Pemberton_Facility_Expansion

JOB No: VE13507-56

COORDINATE SYSTEM: NAD 1983 UTM Zone 10N

amec foster wheeler

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Legend

- Project area
- Unrecorded Site LJ-1
- Previously Recorded Archaeological Site
- Road
- Watercourse

Archaeology Potential

- High
- Moderate

0 25 50 m

Scale 1:3,000

References:
DataBC Data Distribution Service
Open Government License
(http://www.data.gov.bc.ca/)
Geogratis/Geobase
Open Government License - Canada
(http://data.gc.ca/eng/about-datagcca)
MFLNRO - Archaeology Branch
Archaeological Sites RAAD
(Remote Access to Archaeological Data)

CLIENT: BC Hydro Power smart

PROJECT: Pemberton Field Operations Facility Expansion Project AOA

TITLE: Project Area

DATE: February 06, 2017 | ANALYST: RDM | QA/QC: MF

Figure 2

GIS FILE: Fig_2_Pemberton_Facility_Expansion

JOB No: VE13507-56

COORDINATE SYSTEM: NAD 1983 UTM Zone 10N

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0 5 10
m
Scale: 1:500

References:
McIhanney Associates Land Surveying Ltd.

CLIENT: BC Hydro Power smart

PROJECT: Pemberton Field Operations Facility Expansion Project AOA

TITLE:

Topographic Survey Plan and Existing Stuctures

DATE:	ANALYST:	QA/QC:	
February 06, 2017	RDM	MF	**Figure 3**

GIS FILE: Fig_3_Pemberton_Facility_Expansion

JOB No: VE13507-56

COORDINATE SYSTEM: NAD 1983 UTM Zone 10N

amec foster wheeler

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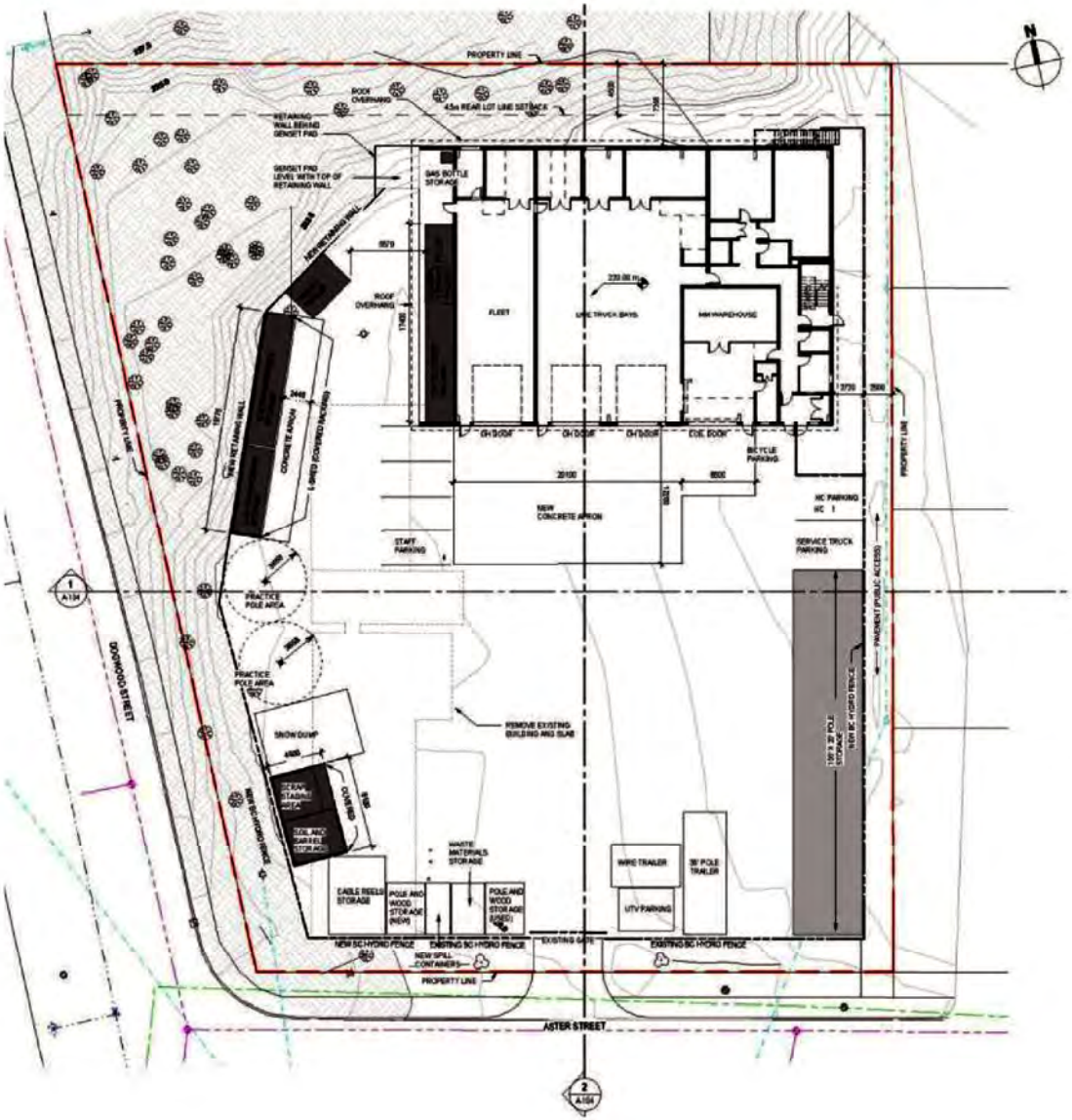
8 Planning & Design – Site Plan



LEGEND

- PROPERTY LINE
- SETBACK LINE
- FENCE
- EXISTING STORM PIPE (UNDERGROUND)
- EXISTING OVERHEAD LINE
- EXISTING WATER PIPE (UNDERGROUND)
- EXISTING SANITARY PIPE (UNDERGROUND)

WSP Kasian

0 7 14 m

Scale 1:650

References:
WSP Kasian

CLIENT: BC Hydro Power smart	PROJECT: Pemberton Field Operations Facility Expansion Project AOA			
TITLE: Proposed Field Facility Upgrades	DATE: February 06, 2017	ANALYST: RDM	QA/QC: MF	**Figure 4**
	GIS FILE: Fig_4_Pemberton_Facility_Expansion			
	JOB No: VE13507-56			
	COORDINATE SYSTEM: NAD 1983 UTM Zone 10N			

amec foster wheeler

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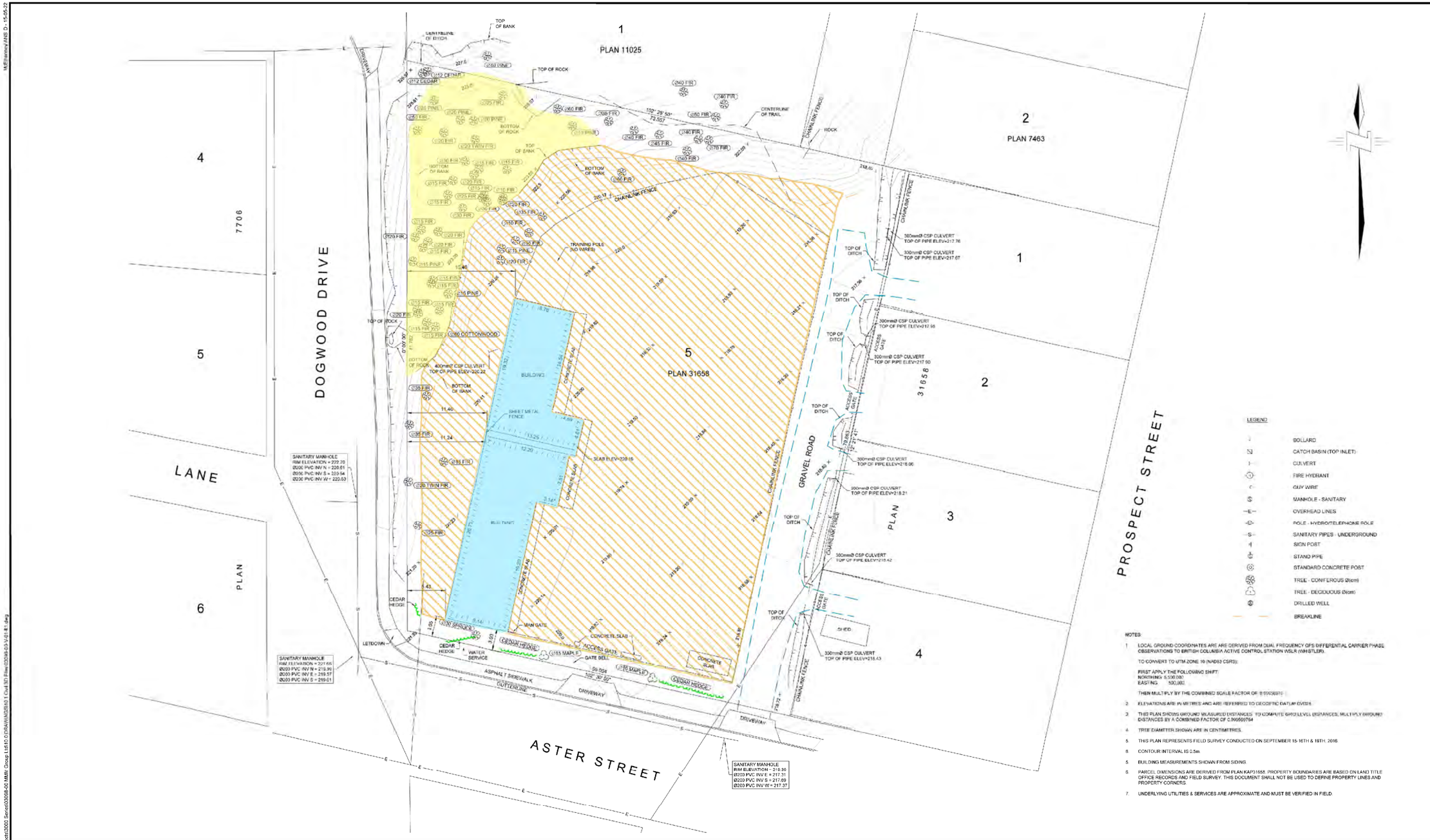

Legend

- Moderate Potential to be assessed under a pre-construction AIA
- Low Potential
- Moderate Potential to be assessed concurrent with construction dependent on pre-construction AIA results

0 5 10 m

Scale: 1:550

References:
McIlhanney Associates Land Surveying Ltd.

CLIENT: Prepared for BC Hydro	PROJECT: Pemberton Field Operations Facility Expansion Project AOA
TITLE: In-field Potential Assessment	DATE: March 01, 2017 | ANALYST: PK | QA/QC: MF | **Figure 5**
	GIS FILE: Fig_5_Pemberton_Facility_Expansion
	JOB No: VE13507-56
	COORDINATE SYSTEM: NAD 1983 UTM Zone 10N

amec foster wheeler

Photo 1. View north-northeast over the facility yard to elevated terrain in background.

Photo 2. View south-southeast over the facility yard from elevated terrain north of fence.

Photo 3. View south to east subject property boundary and St. David's Lane.

Photo 4. View north-northeast to level terrain between facility buildings and Dogwood Street.

Photo 5. View west to level bench in northwest portion of property.

Photo 6. View east-northeast to historic concrete feature.

Photo 7. View east-northeast to sloping bench northeast of BC Hydro property.

12

FLOOD CONSTRUCTION LEVEL REPORT

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www.wspgroup.com

On Behalf of BC Hydro

January 20th 2017

Re Flood Construction Level Recommendation
BC Hydro Post- Disaster Building
1363 Aster Street, Pemberton, BC

P. K. READ ENGINEERING Ltd.
PO Box # 1014, Mt. Currie, BC V0N 2K0
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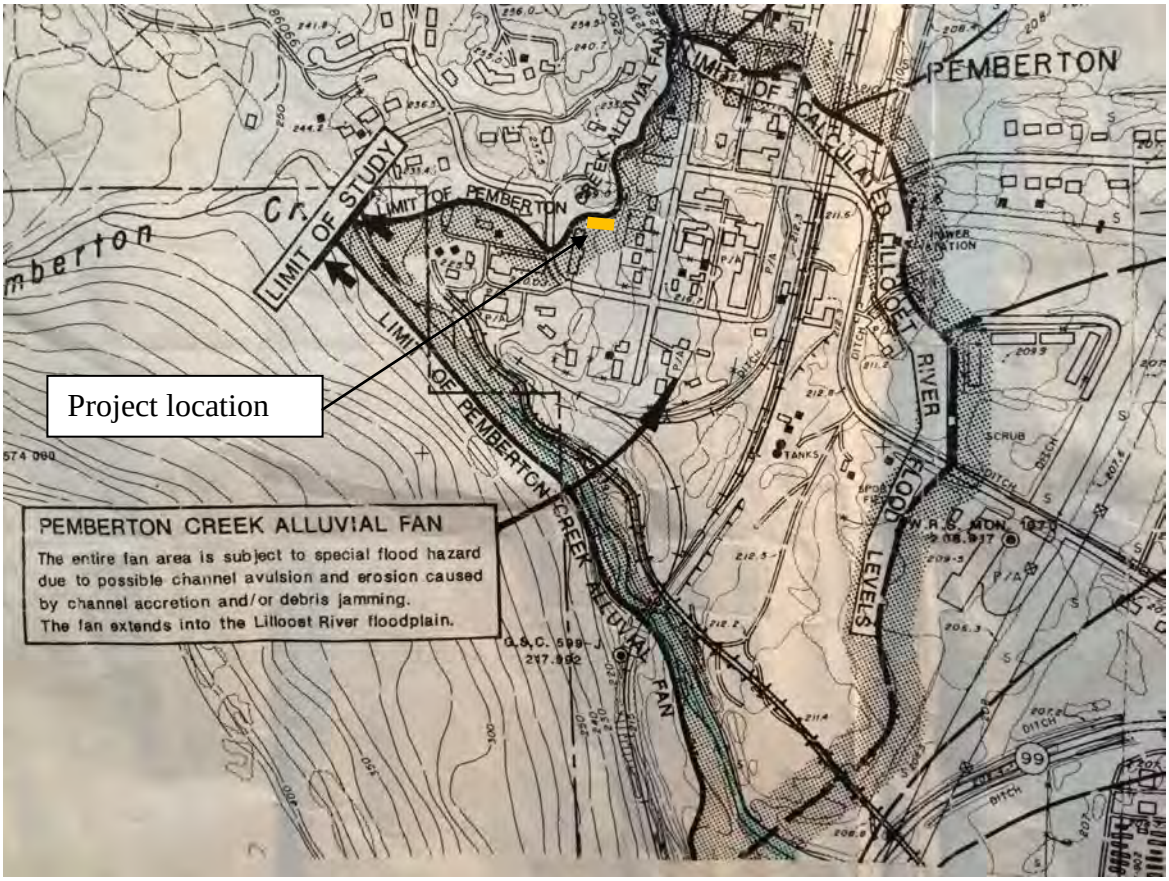
Report Scope

It is understood that a new building is proposed to be constructed upon the BC Hydro Yard at 1363 Aster Street in Pemberton. PK Read Engineering Ltd is retained to provide a recommendation for the Flood Construction Level. It is the scope of this report to provide recommendations to protect the building from potential flood events.

Introduction

The project site at 1363 Aster Street is situated within the town of Pemberton, within the Pemberton Valley, 160km north of Vancouver within the British Columbian Southern Coastal Mountains. The property lies on the northern fringe of the Pemberton Creek Alluvial Fan as shown in figure 1 below; Pemberton Creek is incised behind a rock ridge near the fan apex and flows against the south fringe of the fan. The project site is within the jurisdiction of the Village of Pemberton (VOP).

Figure 1 – Section from Sheet 5 of 11 of the 1990 Environment Canada Floodplain Mapping of the Lillooet River



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Means & Methods

The following means and methods were adopted:

- Site reconnaissance - carried out by the author on January 6th 2017, this included traversing the Zones upslope from the property to the Pemberton Creek.
- Study of the previous work completed in relation to Flood assessments of the Pemberton Creek and its fan. See references for list.

General Background, Creek Description & Information

The BC Hydro works yard and project location is above the Lillooet River Floodplain; typical FCL's for the Lillooet in this reach are 211m geodetic, whereas survey data provided by McElhanney indicates the building site has elevations of 218m geodetic, as a minimum. Therefore the site is at least 7m above 200 year flood events thought possible from the Lillooet River. The proposed building is threatened solely from an avulsion of Pemberton Creek. The hazard posed by flooding of Pemberton Creek has been assessed by several groups, particularly over the past 2 decades. Detailed descriptions of the watershed are available within the references listed. This report offers a summary information list below:

- Pemberton Creek drainage extends from the toe of the Ipsoot Glacier approximately 9 km east of the apex of the Pemberton Creek fan. The watershed is roughly 31km^2.
- Average creek grade is 35% in the Glacier Reach, 5% in the Depositional Reach and 18% in the Waterfall Reach. (Ref. (c) NHC 2001)
- A 200 year flood event for Pemberton Creek is considered as in the order of 100 m^3 per second.
- Dikes protect the present fan from the Apex and continue downstream to its confluence with the Lillooet River. Dykes are maintained by the Pemberton Valley Dyking District.
- "*Pemberton Creek has been upgraded from the apex of the fan near the fire hall downstream to the railway bridge, a distance of about 450 m – this upgrade was completed in 2003 and included adding riprap along the channel side of the dike, thickening the dike and at some sections, raising the crest of the dike (NHC Ref (b))"*.
- The fan apex is roughly at 230m geodetic elevation, the fan slopes at roughly 3.6% to the rail tracks some 500m in horizontal distance, and at an elevation of 212m geodetic. The BC Hydro yard is roughly halfway between the fan apex and rail tracks.

With reference to previous studies, of Pemberton Creek, for flood hazard mitigation, it has generally been accepted to note the Flood Hazard Area Land Use Management Guidelines (Ministry of Water, Land & Air Protection, British Columbia, 2004) section 3.3.1 - which states typically to situate habitable floors 1m above "natural grades".

Site Specific Flood Hazard Discussion

In our particular case we require to interpret the typical recommendations in terms of planned and existing site grades. The property, as cut, slopes from west to east over the building footprint; with geodetic elevations shown as 220m on the high side and 218.2 on the low side near the fence.
The yard has been cut out from the slopes at the fan fringe and the rocky outcrops of the Pemberton "Bench lands". To some extent, the ramp of Dogwood Street, on the west side of the yard protects

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against direct flood flows. Building designs are noted to include for approach ramps to the main floor slab level. Geotechnical recommendations by Geopacific require a 0.6m foundation cover.

In acknowledgement of the relatively smaller flows likely, and the lateral location, upon the fan, of the proposed building, it is recommended that the habitable floor or slab is designed as a minimum of 0.6m above the potential adjacent flood flow water level. It is possible for avulsed flows to travel along Aster Street. For this purpose I believe using the Aster Street entrance grade is an appropriate reference. This grade is assumed as 220.00 m geodetic. The recommended slab height would be **220.6m** geodetic. Surface slopes, down to 220.0m, should be available on all sides of the building. It is noted a retaining structure is planned against the existing bank and the northwest building corner, and this is deemed acceptable, as shown on the updated plans.

Conclusion

Based on the information provided, and given adherence of the recommendations herein it is the opinion of the author that the site may be considered safe for the use intended. I trust this report meets with your requirements, please contact if further information is required.

Yours sincerely,

Phill Read,
P.Eng

References

a) Ministry of Water, Land & Air Protection, British Columbia. Flood Hazard Area Land Use Management Guidelines (2004) section 3.3.1
b) Northwest Hydraulic Consultants, "BCR Properties – Signal Hill Homes –Preliminary Flood Hazard Protection Strategy" December 2008
c) Pemberton Creek Fan Flood/Geohazard & Dike Study Final Report Dec. 2001. NHC.
d) Geotechnical Site Investigation Report. Oct 28th 2016. Geopacific (Vancouver).
e) GeoPacific Consultants Ltd. "Geotechnical Review of Flood Hazards and Construction Recommendations, Proposed Sub-Division, Portage Road, Pemberton, BC". December 20th 2013. Prepared for Tiyata Properties Ltd.
f) GeoPacific Consultants Ltd. " Geotechnical Review of Pemberton Creek Debris Flow Hazard, Proposed Comprehensive Subdivision, Portage Road, Pemberton, BC". Dec. 11th 2013. Prepared for Tiyata Properties Ltd.
g) Geotechnical Report for Proposed Subdivision of BCR Properties (AKA Wye Lands), Pemberton. PK Read Engineering Ltd. July 2016.
h) 1358 Aster Street Pemberton. Lot 3, D.L. 203, Plan 9887, Lillooet District. Geotechnical Report. PK Read Engineering Ltd. April 2009.
i) Environment Canada Inland Waters, British Columbia Ministry of Environment Floodplain Mapping Lillooet River File No. 01-000-S.I Drawing No. 88-44-6, Dated September 30, 1990.
j) APEGS BC Practice Guideline for Legislated Flood Assessments in a Changing BC Climate
k) Village of Pemberton Flood Regulation Bylaw No. 716. 2012.

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TRAFFIC IMPACT STUDY

TRAFFIC IMPACT STUDY – FINAL Rev.1

WSP Canada Inc.

BC Hydro and Power Authority Field Office, Pemberton

February 17, 2017

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OQM | Organizational Quality Management Program

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1 INTRODUCTION

1.1 Background

R.F. Binnie & Associates Ltd. (Binnie) was retained by WSP Canada Inc. (the Client) to prepare a traffic impact study for the proposed redevelopment of the BC Hydro and Power Authority (BC Hydro) Field Office in the Village of Pemberton (the Village). The study development is located at 1363 Aster Street and the project location is shown in **Figure 1-1**.

1.2 Study Objectives

The purpose of this study is to review the background traffic conditions within the study area and estimate the potential site generated traffic volumes on the surrounding road network and propose necessary strategies to manage them.

In general, the objectives of this traffic impact study are to:

- Review background information and existing traffic operations available for this development and study area
- Estimate the development generated traffic demands based on trip generation rates published by the Institute of Transportation Engineers (ITE) and its distribution
- Estimate the effects of site generated traffic on the study road network using Synchro 8/SimTraffic or Sidra software
- Review the proposed access to the project site and the Village's suggested improvements at the Aster Street and Dogwood Street intersection

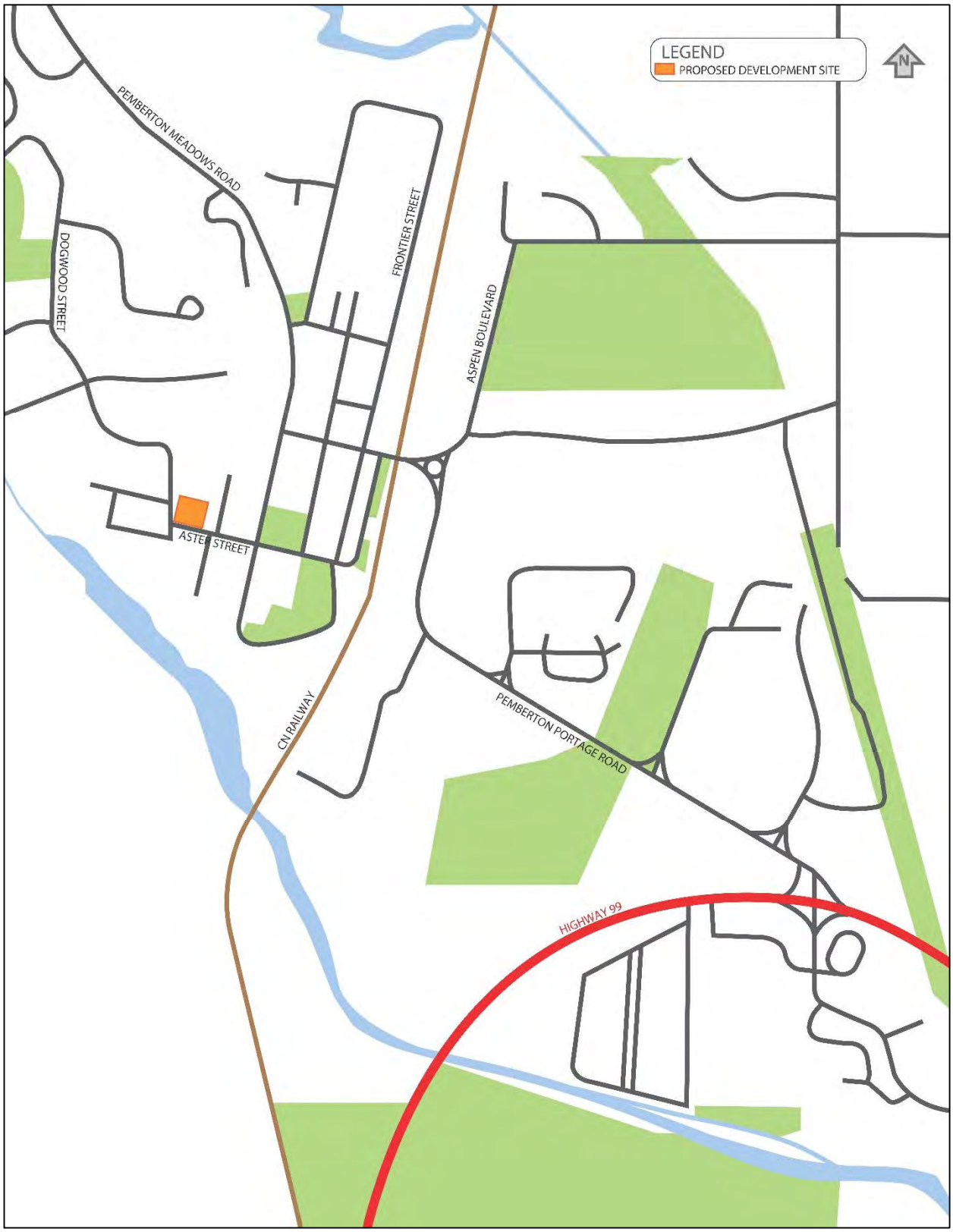

Figure 1-1: Project Location

2 EXISTING CONDITIONS

2.1 Adjacent Road Network

2.1.1 Dogwood Street

Dogwood Street is classified as a local road in the Village and generally runs in the north-south direction on the west side of the Village. It provides access for vehicles from residential properties to the major road network and eventually to the Sea-to-Sky Highway 99. Dogwood Street generally has an unmarked two-way single-lane cross-section.

2.1.2 Aster Street

Aster Street is classified as an arterial road in the Village and generally runs in the east-west direction on the west side of the Village. It provides a connection from the residential properties on Dogwood Street to the major road network and eventually to the Sea-to-Sky Highway 99. Aster Street is generally an unmarked two-way single-lane roadway.

There are currently no signs displaying the speed limit for both roadways, it is assumed that posted speed of study road network is 50 km/hr.

2.2 Study Intersections

2.2.1 Aster Street and Dogwood Street

The intersection of Aster Street and Dogwood Street is a three-legged stop-controlled intersection with a free flowing north approach. For the purpose of this study, the existing configuration will assume that the south approach and east approach of the intersection is Aster Street and the north approach is Dogwood Street. The south approach has one shared through/right-turn lane, the north approach has one left-turn lane and one right-turn lane, and the east approach has one left-turn lane and one right-turn lane. The intersection also provides marked crosswalks on the east and north approaches.

The existing laning configuration and traffic control at the study intersection is shown in **Figure 2-1**.

Figure 2-1: Existing Intersection Laning Configurations

2.3 Traffic Volumes

Existing traffic volumes were collected by TransTech Data Services (TransTech) on January 19, 2017. The AM peak period turning movement data were collected between 7:00 AM and 9:00 AM, and the PM peak period data were collected between 3:00 PM and 6:00 PM.

Based on the traffic volume data gathered at the Dogwood Street and Aster Street intersection, the peak hours were identified to be from 8:00 to 9:00 during the AM peak period and from 3:45 to 4:45 during the PM peak period. Approximately 105 and 134 vehicles entered the intersection during the AM and PM peak hour respectively. The predominant movements for this intersection was observed to be to and from the east approach during both peak periods. Minimal vehicles were observed travelling between the north and south approaches.

The turning movement count data, as provided by TransTech, are attached to this report in **Appendix B**. Please note that the TransTech data assumes Aster Street runs in the east-west direction. Traffic volumes for the study intersection is shown in **Figure 2-2**.

2.4 Transit

Based on the review of BC Transit's website, there are two existing bus routes that operate in the Village of Pemberton. None of the bus routes operate directly on the study road network; however, Route #100 has a stop located at the Pemberton Hotel, which is approximately 200 m east of the study intersection.

Figure 2-2: 2017 Background Traffic Volumes

3 PROPOSED DEVELOPMENT CONCEPT

3.1 Development Concept

The proposed development is located on the north side of Aster Street between Dogwood Street and St. David's Lane. Based on the 50% schematic design provided by the Client, the proposed development will be 1,039 sq. m (11,200 sq. ft.) in size and will consist of the following when complete:

- Three full-sized vehicle bays
- Warehouse and workshops
- Various offices
- Employee amenities
- Support spaces

The proposed development is expected to be constructed in a single phase. The site plan of the proposed field office is attached to this report in **Appendix A**.

3.2 Trip Generation

The forecast trip generation from the study development was derived from the *Trip Generation 8th Edition* published by the Institute of Transportation Engineers (ITE).

3.2.1 Residential Trips

The trip generation rates published under the General Office Building (ITE Ref. 710) land use is assumed to be representatives of the forecast trip generation by the proposed development.

Based on the assumptions outlined in this section, the breakdown of trip generation forecast is shown in **Table 3-1**. It is estimated that the site will generate 18 vehicle trips during the AM peak hour, with 16 vehicles entering and two vehicles exiting the site. During the PM peak hour, it is estimated that 17 vehicle trips will be generated with three vehicles entering and 14 vehicles exiting.

Table 3-1: Trip Generation for the Proposed Development

Description	Size	Unit	ITE Ref.	Avg. Trip Ends per Unit	Generated Trip Ends	% Entering	% Exiting	Vehicle Entering	Vehicle Exiting
AM Peak Hour									
Office									
Office Space	11.2	1,000 Sq.ft	710	1.55	18	88	12	16	2
							Subtotal:	16	2
							Total:	**16**	**2**
PM Peak Hour									
Office									
Office Space	11.2	1,000 Sq.ft	710	1.49	17	17	83	3	14
							Subtotal:	3	14
							Total:	**3**	**14**

3.3 Trip Distribution and Assignment

It is assumed that most of the traffic generated from the proposed development will be heading east from the new development to access Highway 99 via Pemberton Portage Road. In order to provide a

more conservative analysis of the study intersection, trip distribution and assignment in this study were estimated based on the existing traffic patterns as identified in the turning movement count data. All of the site generated traffic will access the proposed development from Aster Street along the southern edge of the development property.

Based on the forecast trip generation summarized in **Table 3-1**, the estimated site generated traffic on the adjacent road network is summarized in **Figure 3-1**.

Figure 3-1: Forecast Site Generated Traffic Volumes

4 TRAFFIC ANALYSIS

4.1 Methodologies

The traffic operational analysis in this report was performed using Synchro 8/SimTraffic software suite, which is generally based on the Highway Capacity Manual (HCM) 2010 methodologies. The traffic operations for each scenario were evaluated to estimate the volume-to-capacity (v/c) ratio, delay, level-of-service (LOS), and 95th percentile queue length at the study intersection.

When reviewing the traffic analysis results, a v/c ratio at or above 1.0 indicates that traffic volumes exceed the intersection capacity. Delay, in terms of seconds, represents the wait time experienced by a driver on the approach to the intersection. LOS is a grading system on intersection operation based on the calculated delay as per the criteria shown in **Table 4-1** for an unsignalized intersection. LOS A indicates that there is minimal delay whereas a LOS F indicates that significant delay is present.

Table 4-1: HCM LOS Criteria for Unsignalized Intersection

Level of Service	Average Control Delay (s/veh)
A	0 - 10
B	> 10 - 15
C	> 15 - 25
D	> 25 - 35
E	> 35 - 50
F	> 50

For the traffic operations review in this study, the target intersection operation thresholds were assumed to be as follows:

- LOS D or better for the overall intersection and individual turning movements
- V/C ratio of 0.85 or lower for individual movements
- Delay less than 35 seconds

Any turning movements not meeting the thresholds in our traffic operation analysis will be identified for improvement recommendations.

Given the existing configuration of the study intersection, the intersection operations were not able to be evaluated using Synchro. As a result, all analyses using the existing configuration were performed using SimTraffic. It is noted that v/c ratio results are not available from SimTraffic. The traffic analysis software output summary reports from SimTraffic are be provided for the final report in **Appendix C.**

4.2 Background Traffic Operations

Background traffic operations were analyzed using data provided by TransTech, summarized in **Figure 2-2**. The values used in the analysis for the Peak Hour Factor (PHF) and truck percentages were also obtained by the turning movement counts for each approach and turning movement respectively.

During both the AM and PM peak hour, the study intersection was found to be operating acceptably at LOS A with minimal delays. All turning movements were found to be operating at LOS A with minimal delays of 4.2 seconds or lower.

The traffic analysis results for the existing traffic scenario are summarized **Table 4-2**.

Table 4-2: 2017 Background Traffic Operations

Intersection	Turning Movement	AM Peak Hour				PM Peak Hour			
		LOS	Delay (s)	V/C Ratio	95% Q (m)	LOS	Delay (s)	V/C Ratio	95% Q (m)
Dogwood St / Aster St *(Unsignalized)*	WBL	A	4.2	N/A	13.1	A	4.0	N/A	14.9
	WBR	A	2.2		13.9	A	2.3		12.4
	NBT/R	A	2.4		11.3	A	2.5		16.9
	SBL	A	0.1		-	A	0.1		-
	SBR	A	0.0		-	A	0.1		-
	Int. LOS	A				A			

4.3 Combined Traffic Operations

The traffic operation analysis results in this section were estimated based on the combined traffic volumes shown in **Figure 4-1**. These volumes were derived by combining the site generated traffic volumes (shown in **Figure 3-1**) with the existing traffic volumes (shown in **Figure 2-2**). Based on the location of the study intersection and the limited growth potential of the area, there was no background growth assumed at the study intersection. In addition, an assumed PHF of 0.92 and 2% of heavy vehicles was used for the opening day analysis.

4.3.1 Opening Day Traffic Operations

During both the AM and PM peak hours, the Aster Street and Dogwood Street intersection is expected to remain operating at LOS A. All turning movements are expected to operate at LOS A with minimal delays of 3.7 seconds or lower.

The Aster Street and site access intersection is expected to operate at LOS A during both the AM and PM peak hours, based on the existing unsignalized configuration.

The Opening Day network traffic operations analysis results are shown in **Table 4-3**.

Table 4-3: Opening Day Combined Traffic Operations

Intersection	Turning Movement	AM Peak Hour				PM Peak Hour			
		LOS	Delay (s)	V/C Ratio	95% Q (m)	LOS	Delay (s)	V/C Ratio	95% Q (m)
Dogwood St / Aster St *(Unsignalized)*	WBL	A	3.7	N/A	13.1	A	3.5	N/A	13.1
	WBR	A	2.4		14.0	A	2.3		14.4
	NBT/R	A	2.3		11.6	A	2.3		14.1
	SBL	A	0.1		-	A	0.0		-
	SBR	A	0.0		-	A	0.0		-
	Int. LOS	A				A			
Site Access / Aster St *(Unsignalized)*	EBL/T	A	0.9	N/A	1.9	A	0.2	N/A	-
	WBT/R	A	0.7		-	A	0.7		-
	SBL/R	A	1.8		3.0	A	4.0		8.6
	Int. LOS	A				A			

Figure 4-1: Opening Day Combined Traffic Volumes

4.4 Internal Traffic Circulation Review

4.4.1 Off-Street Parking Requirements

Based on the Village's Zoning Bylaw (Bylaw No. 466, 2001), the requirements for off-street parking for the proposed development are described below:

- Office parking at 1.0 parking space per 28 sq. m of gross floor area (Section 508 (2))
- Accessible parking at 2.0 space for 21 to 50 parking spaces required (Section 506 (a))

Based on this, a minimum of 38 parking stalls will be required for the proposed development at its full build out. In addition, the proposed development is required to provide 2 marked accessible parking stalls.

It is noted that actual workspace of the proposed office area is 152 sq. m., which results in only six parking spaces required by the development. Also, the full occupant load of the development is expected to have six full-time staff with a few additional part-time staff. As a result, it is requested that the proposed development seek a variance from the Village's Bylaw requirements and provide six off-street parking spaces on the site.

4.4.2 Off-Street Loading Requirements

Based on the Village's Zoning Bylaw (Bylaw No. 466, 2001), the requirements for off-street loading spaces for the proposed development are described below:

- Office loading at 1.0 space for 300 sq. m to 3,000 sq. m of gross floor area and 1.0 for each 3,500 sq. m of additional gross floor area (Section 514)

Based on this requirement, the proposed development is required to provide a minimum of 1 loading space at its full build out. The development is expected to provide 3 truck loading bays at its full build out.

5 PROPOSED INTERSECTION IMPROVEMENTS

As an added analysis, Binnie used the information provided by the Village to produce analysis results for four proposed intersection improvements for the Aster Street and Dogwood Street intersection. While these improvements are not required to accommodate the forecast traffic volumes generated but the proposed development, the analysis was provided as an added bonus for information only to the Village. The analysis results for the four proposed improvement options are attached to this report in **Appendix D**.

6 CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

The purpose of this study is to review whether the forecast traffic generation from the proposed BC Hydro Field Office can be accommodated by the study network, which is namely the Aster Street and Dogwood Street intersection.

The main access of the proposed development is located on the southern edge of the development along Aster Street. Based on the ITE vehicle trip generation rates, the study development is expected to generate 18 vehicle trips during the AM peak hour and 17 vehicle trips during the PM peak hour. This study assumes that the development will be constructed in one phase and there is no significant background traffic growth at the study intersection.

A summary of the study findings are as follows:

- For the background scenario, the study intersection is expected to operate at LOS A based on traffic operational analysis without any new transportation improvements during both the AM and PM peak hours.
- With the site generated traffic added to the study road network, the study intersection is expected to remain operating at LOS A during both the AM and PM peak hours.
- Transportation improvements are not expected to be required to support the proposed development.

6.2 Recommendations

Transportation improvements are not necessary to support the traffic generated by the study development. The study intersection is expected to remain operating at LOS A during both the AM and PM peak hours with the site generated traffic added. Based on the Village's Bylaw requirements, the development will require 38 off-street parking spaces, two accessible parking spaces, and one loading space to be provided. The Village may consider a lower number of off-street parking spaces due to the low number of occupants in the development and the actual size of the workspace and office space.

7 CLOSING

We trust you find the above suitable for your needs. Should you have any questions or comments on the information contained herein, please do not hesitate to contact the Project Manager.

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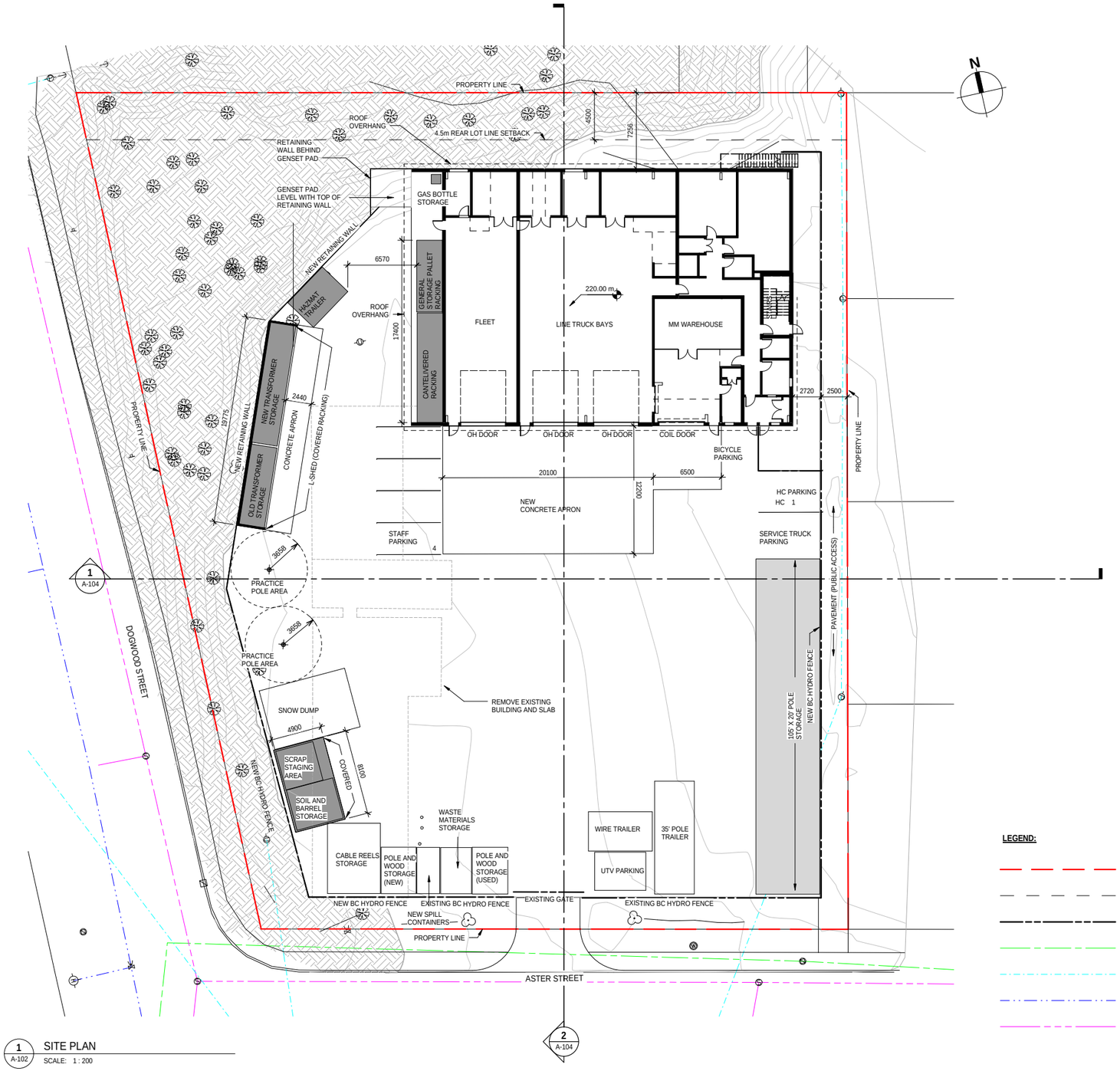
Traffic Engineer

Reviewed by:

Brendan Stevenson, P.Eng., PTOE
Traffic Engineer

APPENDIX A

PROPOSED FIELD OFFICE SITE PLAN



1 SITE PLAN (A-102)
SCALE: 1 : 200

PROJECT DATA

ZONING: C-1 Town Center Commercial

LOT SIZE: 5,174 S.M.

SETBACKS:
0m from front parcel line
0m from interior side parcel line
0m from exterior side parcel line
4.5m from rear parcel line for principal building
3.5m from rear parcel line for accessory structure

BUILDING HEIGHT:

Maximum Height of Principal Building:	10.5 m
Maximum Height of Accessory Structures:	4.5 m
Proposed Building Height:	9.4 m

BUILDING FLOOR AREAS:

Proposed Main Building		1039 sm
Level 1	820 sm	
Level 2	219 sm	
Proposed Transformer Storage		54 sm
Total Buildings Floor Area on Site:		1166 sm
Proposed Floor Area Ratio:		20%
Maximum Density/ FAR:		200%

SITE COVERAGE:

Proposed Main Building (including west canopy)	893 sm
Proposed Transformer Storage	54 sm
Proposed Transformer Storage	40 sm
Total Building Area (Coverage):	947 sm
Proposed Coverage :	19%
Maximum Lot Coverage:	75%

PARKING PROVISION:

Workspace/office gross floor area	152 sm
Required stalls (1 stall per 28 sm of gross area)	6
Provided stalls: 6	
H/C PARKING: 1 required	

LOADING PROVISION:

Required Loading (Industrial: 2 for 500 m2 to 2,500 sm of gross floor area)	2
Provided Loading Bays (truck bays)	3

LEGEND:

- PROPERTY LINE
- SETBACK LINE
- FENCE
- EXISTING STORM PIPE (UNDERGROUND)
- EXISTING OVERHEAD LINE
- EXISTING WATER PIPE (UNDERGROUND)
- EXISTING SANITARY PIPE (UNDERGROUND)

BC Hydro Power smart

SITE PLAN - PROJECT DATA
PEMBERTON BC HYDRO FIELD OFFICE
1363 ASTER ST, PEMBERTON, BC, CANADA

A-102
2016-11-07
PROJECT 180283

WSP Kasian

APPENDIX B

EXISTING TURNING MOVEMENT COUNT DATA

Major Route: Aster Street
Minor Route: Dogwood Street
Municipality: Pemberton
Filename: 1-Aster St @ Dogwood St-Jan 19, 2017.xlsx
Location #: 1

Date: January 19, 2017
Day-of-week: Thursday

East/West Route: Aster Street
Intersection Type: 3-leg north approach
Signalized?: No
Weather: Rain and wet

Vehicle Classifications: Regular Vehicles
Trucks
Bicycles

This data is for All Vehicles Combined

Shift	Start	End	Duration
AM	7:00	9:00	2.00
MD			
PM	15:00	18:00	3.00
Total	**7:00**	**18:00**	**5.00**

Notes: 24-hour clock used for reporting (15-minute increments)
North Approach - southbound vehicles approaching intersection from the north
15x4 - 15 min volume (from maximum 15 minute period of movement/approach in peak hour period [*]) x 4
Pedestrians - N indicates pedestrians crossing north approach (east/west)

Comments: Due to a severe avalance risk, Route 99 north of Pemberton to Lillooet was closed during the AM shift of this study day. The road was opened by the time the PM shift started.

Survey Data
All Vehicles Combined

Aster Street @ Dogwood Street
Thursday, January 19, 2017

Time Period	Dogwood St NORTH Approach				SOUTH Approach				Aster St WEST Approach				Aster St EAST Approach				Total Volume		Peak	Pedestrians			
Begins	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	15-min	Hour		N	S	W	E
7:00	6		0	**6**					1	0		**1**		2	1	**3**	**10**			1		1	0
7:15	16		0	**16**					0	2		**2**		2	3	**5**	**23**			0		0	0
7:30	5		0	**5**					0	2		**2**		1	0	**1**	**8**			0		0	0
7:45	8		0	**8**					0	2		**2**		6	1	**7**	**17**	58		0		0	0
8:00	10		0	**10**					0	7		**7**		7	7	**14**	**31**	79	+	1		1	1
8:15	8		0	**8**					0	4		**4**		7	3	**10**	**22**	78	*	1		0	0
8:30	9		0	**9**					0	5		**5**		7	4	**11**	**25**	95	*	1		0	0
8:45	7		0	**7**					0	3		**3**		7	10	**17**	**27**	105	*	0		0	0
n/a																							
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n/a																							
n/a																							
n/a																							
n/a																							
n/a																							
n/a																							
Total	69		0	**69**					1	25		**26**		39	29	**68**	**163**			4		2	1

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n/a																							
Total																							

15:00	5		0	**5**					0	8		**8**		9	10	**19**	**32**			12		0	0
15:15	3		0	**3**					0	0		**0**		16	7	**23**	**26**			3		0	0
15:30	2		0	**2**					1	7		**8**		9	5	**14**	**24**			2		0	0
15:45	5		0	**5**					0	14		**14**		12	6	**18**	**37**	119	+	2		0	0
16:00	4		0	**4**					0	20		**20**		8	3	**11**	**35**	122	*	3		2	2
16:15	6		0	**6**					0	11		**11**		3	6	**9**	**26**	122	*	0		0	0
16:30	8		1	**9**					0	7		**7**		8	12	**20**	**36**	134	*	4		0	0
16:45	8		0	**8**					0	7		**7**		3	6	**9**	**24**	121		1		0	0
17:00	9		1	**10**					0	10		**10**		3	15	**18**	**38**	124		2		1	1
17:15	9		0	**9**					0	4		**4**		0	13	**13**	**26**	124		2		0	0
17:30	3		0	**3**					0	1		**1**		3	9	**12**	**16**	104		3		0	1
17:45	4		0	**4**					0	3		**3**		1	6	**7**	**14**	94		0		0	0
n/a																							
n/a																							
n/a																							
n/a																							
n/a																							
n/a																							
n/a																							
n/a																							
Total	66		2	**68**					1	92		**93**		75	98	**173**	**334**			34		3	4

Time	Dogwood St								Aster St				Aster St												
Period	NORTH Approach				SOUTH Approach				WEST Approach				EAST Approach				Total Volume		Peak	Pedestrians				Conflict	
Begins	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	15-min	Hour		N	S	W	E	15 min	Hr
7:00	6		0	6					1	0		1		2	1	3	10			1		1	0	10	
7:15	16		0	16					0	2		2		2	3	5	23			0		0	0	21	
7:30	5		0	5					0	2		2		1	0	1	8			0		0	0	7	
7:45	8		0	8					0	2		2		6	1	7	17	58		0		0	0	15	53
8:00	10		0	10					0	7		7		7	7	14	31	79	+	1		1	1	24	67
8:15	8		0	8					0	4		4		7	3	10	22	78	*	1		0	0	18	64
8:30	9		0	9					0	5		5		7	4	11	25	95	*	1		0	0	20	77
8:45	7		0	7					0	3		3		7	10	17	27	105	*	0		0	0	24	86
n/a																									
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n/a																									
n/a																									
Total	69		0	**69**					1	25		**26**		39	29	**68**	163			4		2	1		138
Avg Hr	34.5		0	**34.5**					0.5	12.5		**13**		19.5	14.5	**34**	81.5			2		1	0.5		

Peak hour of the intersection

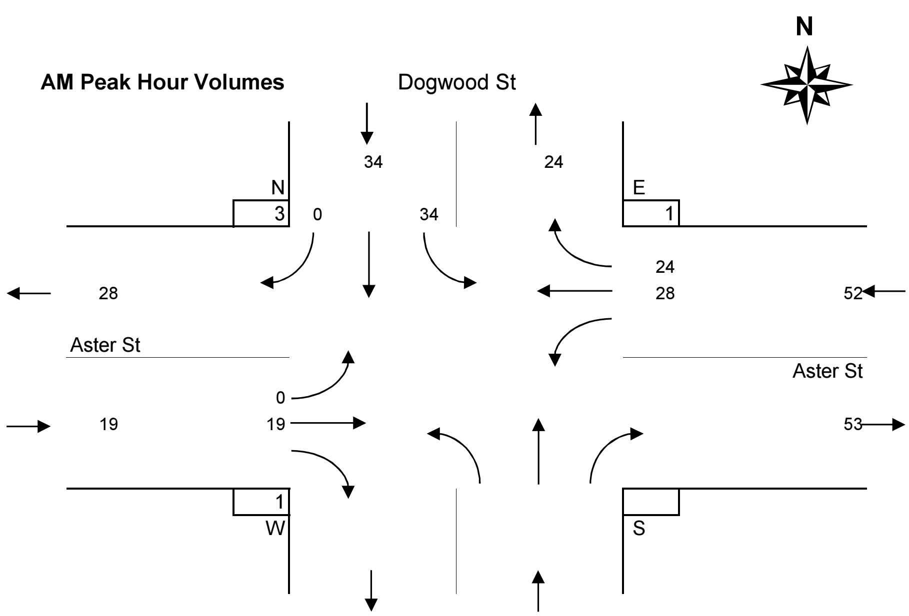
Pk Hr	34		0	34					0	19		19		28	24	52	105	*		3		1	1		86
15x4	40		0	40					0	28		28		28	40	68	124	+		4		4	4		108
PHF	0.85		n/a	**0.85**					n/a	0.68		**0.68**		1.00	0.60	**0.76**	0.85			0.75		0.25	0.25		0.80

Peak hour of conflicting volumes for the intersection

Pk Hr	34		0	34					0	19		19		28	24	52	105	*		3		1	1		86
15x4	40		0	40					0	28		28		28	40	68	124	+		4		4	4		108
PHF	0.85		n/a	**0.85**					n/a	0.68		**0.68**		1.00	0.60	**0.76**	0.85			0.75		0.25	0.25		0.80

** Calculated peak hour occurs during the first or last hour of shift and therefore may be invalid. **

AM Peak Hour Volumes



Time	Dogwood St								Aster St				Aster St												
Period	NORTH Approach				SOUTH Approach				WEST Approach				EAST Approach				Total Volume		Peak	Pedestrians				Conflict	
Begins	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	15-min	Hour		N	S	W	E	15 min	Hr
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n/a																									
n/a																									
n/a																									
n/a																									
n/a																									
Total																									
Avg Hr																									

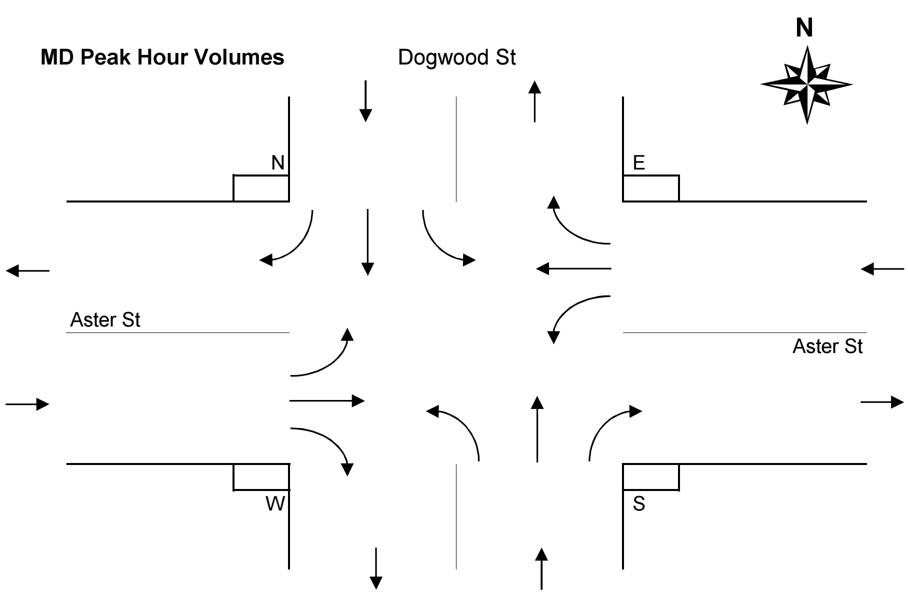
Peak hour of the intersection

Pk Hr																	*						
15x4																	+						
PHF																							

Peak hour of conflicting volumes for the intersection

Pk Hr																	*						
15x4																	+						
PHF																							

MD Peak Hour Volumes



PM Peak Period
All Vehicles Combined

Aster Street @ Dogwood Street
Thursday, January 19, 2017

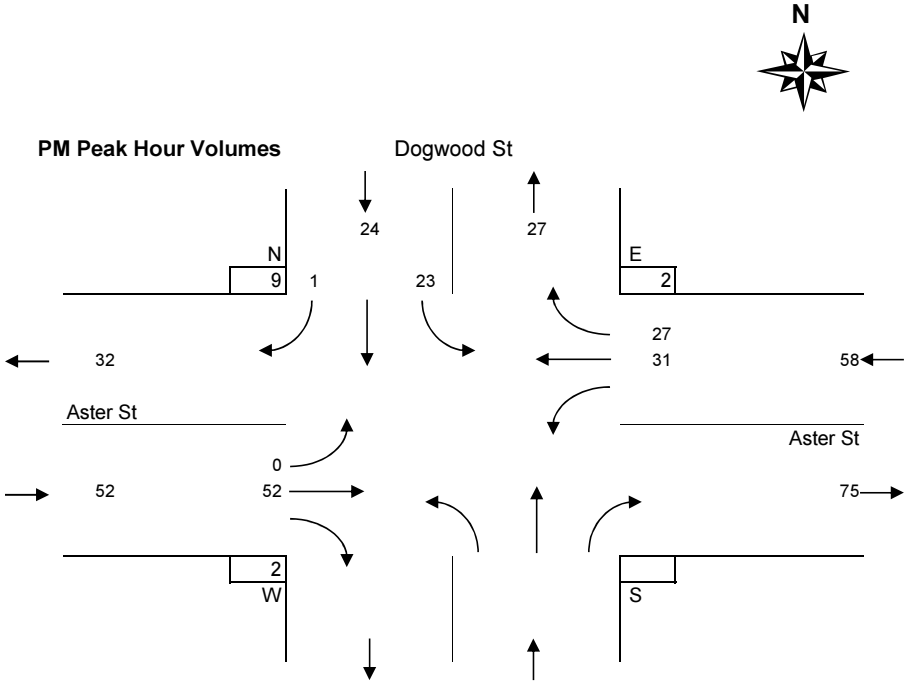
Time Period	Dogwood St NORTH Approach				SOUTH Approach				Aster St WEST Approach				Aster St EAST Approach				Total Volume		Peak	Pedestrians				Conflict	
Begins	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	15-min	Hour		N	S	W	E	15 min	Hr
15:00	5		0	5					0	8		8		9	10	19	32			12		0	0	24	
15:15	3		0	3					0	0		0		16	7	23	26			3		0	0	26	
15:30	2		0	2					1	7		8		9	5	14	24			2		0	0	17	
15:45	5		0	5					0	14		14		12	6	18	37	119	+	2		0	0	23	90
16:00	4		0	4					0	20		20		8	3	11	35	122	*	3		2	2	24	90
16:15	6		0	6					0	11		11		3	6	9	26	122	*	0		0	0	17	81
16:30	8		1	9					0	7		7		8	12	20	36	134	*	4		0	0	28	92
16:45	8		0	8					0	7		7		3	6	9	24	121		1		0	0	17	86
17:00	9		1	10					0	10		10		3	15	18	38	124		2		1	1	27	89
17:15	9		0	9					0	4		4		0	13	13	26	124		2		0	0	22	94
17:30	3		0	3					0	1		1		3	9	12	16	104		3		0	1	15	81
17:45	4		0	4					0	3		3		1	6	7	14	94		0		0	0	11	75
n/a																									
n/a																									
n/a																									
n/a																									
n/a																									
n/a																									
n/a																									
n/a																									
Total	66		2	**68**					1	92		**93**		75	98	**173**	334			34		3	4		240
Avg Hr	22		0.666666667	**22.66666667**					0.333333333	30.66666667		**31**		25	32.66666667	**57.66666667**	111.3333333			11.33333333		1	1.333333333		

Peak hour of the intersection

Pk Hr	23		1	24					0	52		52		31	27	58	134	*		9		2	2		81
15x4	32		4	36					0	80		80		48	48	80	148	+		16		8	8		128
PHF	0.72		0.25	**0.67**					n/a	0.65		**0.65**		0.65	0.56	**0.73**	0.91			0.56		0.25	0.25		0.63

Peak hour of conflicting volumes for the intersection

Pk Hr	34		2	36					0	28		28		14	46	60	124	*		9		1	1		94
15x4	36		4	40					0	40		40		32	60	80	152	+		16		4	4		128
PHF	0.94		0.50	**0.90**					n/a	0.70		**0.70**		0.44	0.77	**0.75**	0.82			0.56		0.25	0.25		0.73



Entire Survey Period

5 Hours

	Dogwood St NORTH Approach				SOUTH Approach				Aster St WEST Approach				Aster St EAST Approach				Total	Pedestrians			
	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Volume	N	S	W	E
Total	135		2	**137**					2	117		**119**		114	127	**241**	497	38		5	5
Avg Hr	27		0.4	**27.4**					0.4	23.4		**23.8**		22.8	25.4	**48.2**	99.4	7.6		1	1

AM Peak Period

2 Hours

Totals	Dogwood St NORTH Approach				SOUTH Approach				Aster St WEST Approach				Aster St EAST Approach				Total	Pedestrians			
	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Volume	N	S	W	E
Period	69		0	**69**					1	25		**26**		39	29	**68**	163	4		2	1
Avg Hr	34.5		0	**34.5**					0.5	12.5		**13**		19.5	14.5	**34**	81.5	2		1	0.5

MD Peak Period

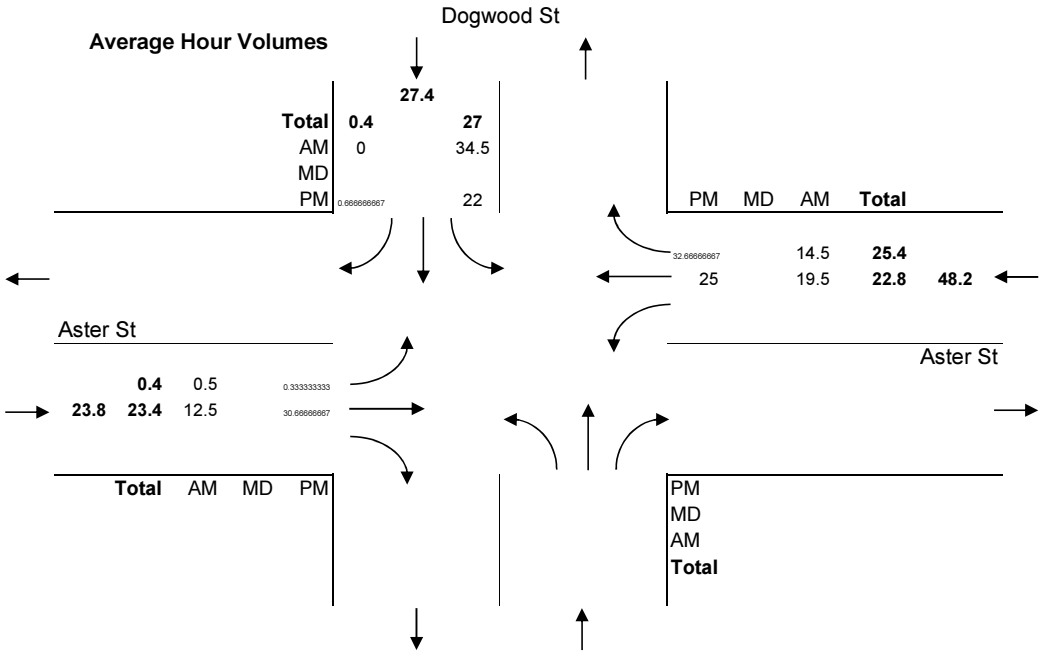
Hours

Totals	Dogwood St NORTH Approach				SOUTH Approach				Aster St WEST Approach				Aster St EAST Approach				Total	Pedestrians			
	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Volume	N	S	W	E
Total																					
Avg Hr																					

PM Peak Period

3 Hours

Totals	Dogwood St NORTH Approach				SOUTH Approach				Aster St WEST Approach				Aster St EAST Approach				Total	Pedestrians			
	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Volume	N	S	W	E
Total	66		2	**68**					1	92		**93**		75	98	**173**	334	34		3	4
Avg Hr	22		0.666666667	**22.66666667**					0.333333333	30.66666667		**31**		25	32.66666667	**57.66666667**	111.3333333	11.33333333		1	1.333333333



APPENDIX C

SIMTRAFFIC ANALYSIS RESULTS

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3: Aster St/Dogwood St Performance by movement

Movement	WBL	WBR	NBR	SBL	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.1
Denied Del/Veh (s)	4.1	0.2	0.1	4.1	2.4
Total Delay (hr)	0.0	0.0	0.0	0.0	0.1
Total Del/Veh (s)	4.2	2.2	2.4	0.1	2.1

Total Network Performance

Denied Delay (hr)	0.1
Denied Del/Veh (s)	2.4
Total Delay (hr)	0.1
Total Del/Veh (s)	2.4

Intersection: 3: Aster St/Dogwood St

Movement	WB	WB	NB
Directions Served	L	R	TR
Maximum Queue (m)	13.6	16.6	9.3
Average Queue (m)	5.4	5.6	4.1
95th Queue (m)	13.1	13.9	11.3
Link Distance (m)		122.8	130.4
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)	20.0		
Storage Blk Time (%)	0	0	
Queuing Penalty (veh)	0	0	

Network Summary

Network wide Queuing Penalty: 0

3: Aster St/Dogwood St Performance by movement

Movement	WBL	WBR	NBR	SBL	SBT	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.1
Denied Del/Veh (s)	4.2	0.1	0.1	4.1	0.4	1.6
Total Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.1
Total Del/Veh (s)	4.0	2.3	2.5	0.1	0.1	2.4

Total Network Performance

Denied Delay (hr)	0.1
Denied Del/Veh (s)	1.6
Total Delay (hr)	0.1
Total Del/Veh (s)	2.7

Intersection: 3: Aster St/Dogwood St

Movement	WB	WB	NB
Directions Served	L	R	TR
Maximum Queue (m)	16.7	10.7	22.1
Average Queue (m)	6.1	5.0	8.7
95th Queue (m)	14.9	12.4	16.9
Link Distance (m)		174.6	130.5
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)	20.0		
Storage Blk Time (%)	0	0	
Queuing Penalty (veh)	0	0	

Network Summary

Network wide Queuing Penalty: 0

3: Aster St/Dogwood St Performance by movement

Movement	WBL	WBT	WBR	NBR	SBL	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	4.1	1.4
Total Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.1
Total Del/Veh (s)	3.7	0.0	2.4	2.3	0.1	1.8

5: Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.1	0.1		0.1	0.1
Total Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	0.9	0.1	0.7	0.0		1.8	0.5

Total Network Performance

Denied Delay (hr)	0.1
Denied Del/Veh (s)	1.4
Total Delay (hr)	0.1
Total Del/Veh (s)	2.4

Intersection: 3: Aster St/Dogwood St

Movement	WB	WB	NB
Directions Served	L	R	TR
Maximum Queue (m)	11.6	17.2	9.3
Average Queue (m)	6.1	5.6	4.5
95th Queue (m)	13.1	14.0	11.6
Link Distance (m)	27.9	27.9	130.8
Upstream Blk Time (%)		0	
Queuing Penalty (veh)		0	
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5:

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (m)	3.7	7.7
Average Queue (m)	0.1	0.4
95th Queue (m)	1.9	3.0
Link Distance (m)	27.9	71.3
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 0

3: Aster St/Dogwood St Performance by movement

Movement	WBL	WBT	WBR	NBR	SBL	SBT	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	4.1	0.1	0.7
Total Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total Del/Veh (s)	3.5	0.1	2.3	2.3	0.0	0.0	2.2

5: Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)		0.0	0.1	0.1	0.1	0.1	0.0
Total Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)		0.2	0.7	0.1	4.0	2.0	0.6

Total Network Performance

Denied Delay (hr)	0.0
Denied Del/Veh (s)	0.7
Total Delay (hr)	0.1
Total Del/Veh (s)	2.9

Intersection: 3: Aster St/Dogwood St

Movement	WB	WB	NB
Directions Served	L	R	TR
Maximum Queue (m)	11.5	15.9	14.8
Average Queue (m)	6.0	6.0	7.8
95th Queue (m)	13.1	14.4	14.1
Link Distance (m)	27.9	27.9	130.8
Upstream Blk Time (%)		0	
Queuing Penalty (veh)		0	
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5:

Movement	SB
Directions Served	LR
Maximum Queue (m)	9.5
Average Queue (m)	2.5
95th Queue (m)	8.6
Link Distance (m)	71.3
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 0

APPENDIX D

PROPOSED INTERSECTION IMPROVEMENTS ANALYSIS

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PROPOSED INTERSECTION IMPROVEMENTS ANALYSIS

As per BC Hydro's request, an analysis of four various options provided by the Village for improving Aster Street and Dogwood Street intersection was conducted. The intersection of Aster Street and Dogwood Street currently has an unconventional configuration which may result in driver confusion and may cause safety concerns for pedestrians and cyclists wanting to cross the intersection. The following four options are proposed improvements from the Village to improve the safety of the intersection for vehicles, pedestrians, and cyclists. For the proposed options, the existing south approach on Aster Street will be modified to become an east approach at the intersection. The drawings of the four proposed improvement options are provided in **Appendix D-1**.

Option 1: All-Way Stop-Control

The All-Way Stop-Control option is anticipated to have pedestrian crosswalks on all three approaches. The north approach is expected to have separate left-turn and right-turn lanes, the west approach is expected to provide a single shared left-turn/though lane, and the east approach will have a right-turn lane as well as a through lane. This option will is expected to provide a safer environment for pedestrians and cyclists to cross the intersection.

During the AM and PM peak hours, all turning movements are expected to operate at LOS A with minimal delays of 7.8 seconds or lower. The maximum v/c ratio is expected to be 0.07 in the eastbound left-turn/through movement during the PM peak hour.

The traffic operational analysis results for this configuration is shown in **Table 1.** The All-Way Stop-Control configuration was provided by the Village and is shown in **Figure 1**.

Table 1: All-Way Stop-Control Traffic Operations

Intersection	Turning Movement	AM Peak Hour				PM Peak Hour			
		LOS	Delay (s)	V/C Ratio	95% Q (m)	LOS	Delay (s)	V/C Ratio	95% Q (m)
Dogwood St / Aster St *(AWSC)*	EBL/T	A	7.6	0.03	N/A	A	7.8	0.07	N/A
	WBL	A	6.7	0.04		A	6.7	0.05	
	WBR	A	5.9	0.03		A	5.9	0.04	
	SBL	A	7.4	0.06		A	7.3	0.04	
	SBR	A	0.0	0.00		A	5.9	0.00	
	Int. LOS	A				A			

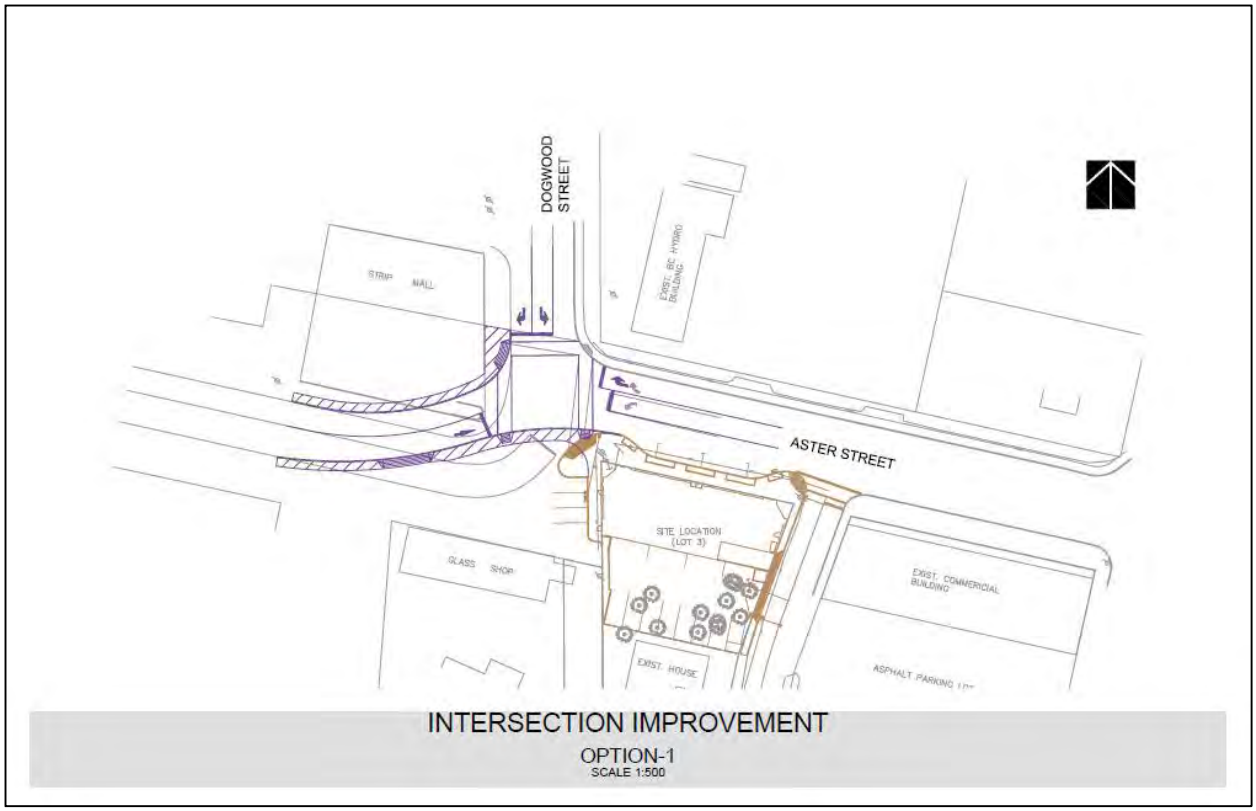

Figure 1: All-Way Stop-Control Configuration

Option 2: Two-Way Stop-Control

The Two-Way Stop-Control option is expected to have the west and east approaches stop-controlled while the north approach will be a free movement. The west approach is expected to have a single through/left-turn lane, the east approach is expected to have a channelized right-turn lane and a through lane, while the free flowing north approach is expected to have a left-turn lane and right-turn lane provided. All three approaches are expected to have pedestrian crosswalks.

During the AM and PM peak hours, all turning movements are expected to operate at LOS A with minimal delays of 9.8 seconds or lower. The maximum v/c ratio is expected to be 0.07 and all turning movements are expected to have minimal queue lengths.

The traffic operational analysis results for this configuration is shown in **Table 2**. The Two-Way Stop-Control configuration was provided by the Village and is shown in **Figure 2**.

Table 2: Two-Way Stop-Control Traffic Operations

Intersection	Turning Movement	AM Peak Hour				PM Peak Hour			
		LOS	Delay (s)	V/C Ratio	95% Q (m)	LOS	Delay (s)	V/C Ratio	95% Q (m)
Dogwood St / Aster St *(TWSC)*	EBT/R	A	9.7	0.03	0.7	A	9.7	0.07	1.7
	WBL	A	9.8	0.04	0.9	A	9.6	0.05	1.1
	WBR	A	8.4	0.02	0.6	A	8.4	0.03	0.7
	SBL	A	7.3	0.03	0.6	A	7.3	0.02	0.4
	SBR	A	0.0	0.00	0.0	A	0.0	0.00	0.0
	Int. LOS	A				A			

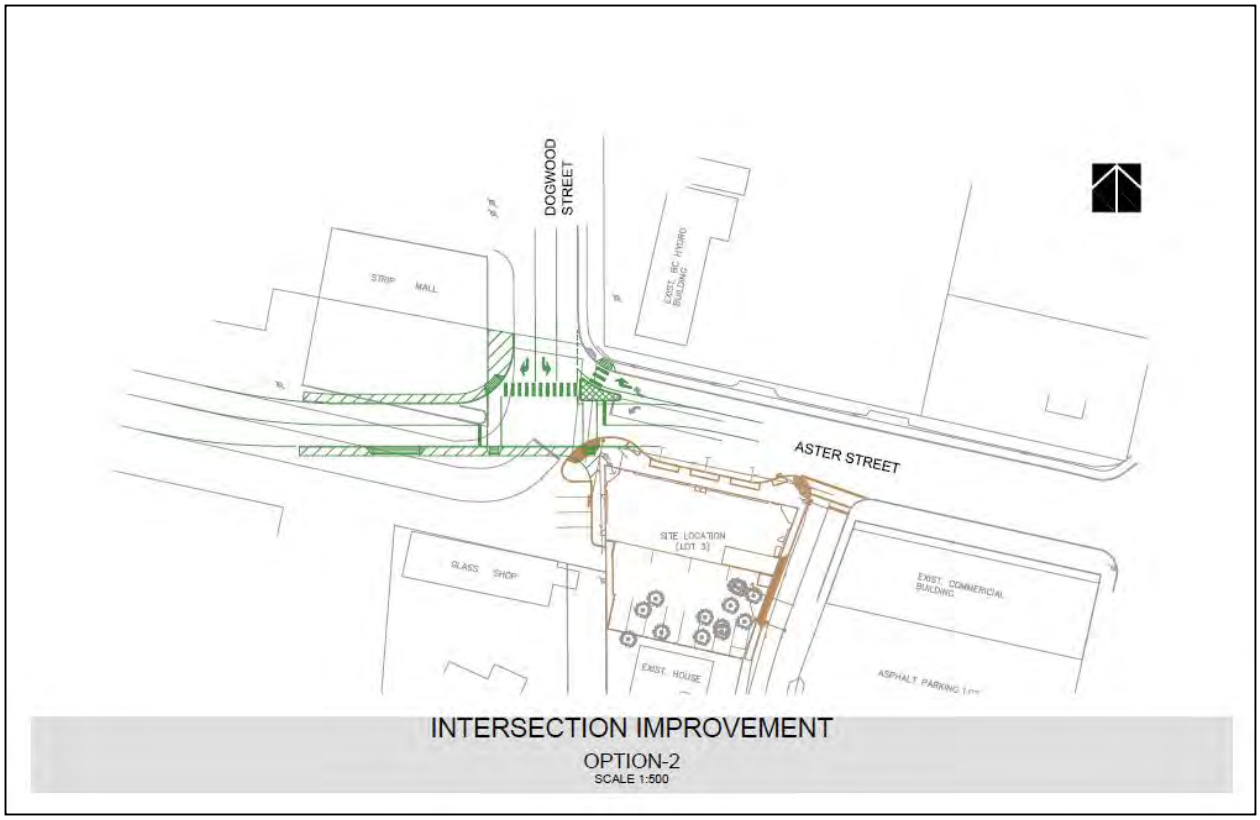

Figure 2: Two-Way Stop Control Configuration

Option 3: Painted Centre Traffic Circle

The Painted Centre Traffic Circle option is expected to be 16 metres in diameter with north, east and west approaches provided. Each approach is expected to include pedestrian crosswalks. The Painted Centre Traffic Circle option was analyzed using Sidra based on a roundabout configuration.

During the AM and PM peak hours, all turning movements are expected to operate at LOS A with minimal delays of 3.8 seconds or lower. The maximum v/c ratio is expected to be 0.07 in the westbound movement and all turning movements are expected to have minimal queue lengths.

The traffic operational analysis results for the painted Centre Traffic Circle configuration is shown in **Table 3**. The Painted Centre Traffic Circle configuration was provided by the Village and is shown in **Figure 3**.

Table 3: Painted Centre Traffic Circle and Modern Roundabout Traffic Operations

Intersection	Turning Movement	AM Peak Hour				PM Peak Hour			
		LOS	Delay (s)	V/C Ratio	95% Q (m)	LOS	Delay (s)	V/C Ratio	95% Q (m)
Dogwood St / Aster St *(Roundabout)*	EBT/R	A	3.6	0.02	0.1	A	3.8	0.05	1.5
	WBL/R	A	3.7	0.05	0.2	A	3.8	0.07	1.8
	SBL/R	A	3.7	0.04	0.1	A	3.6	0.02	0.6
	Int. LOS	A				A			

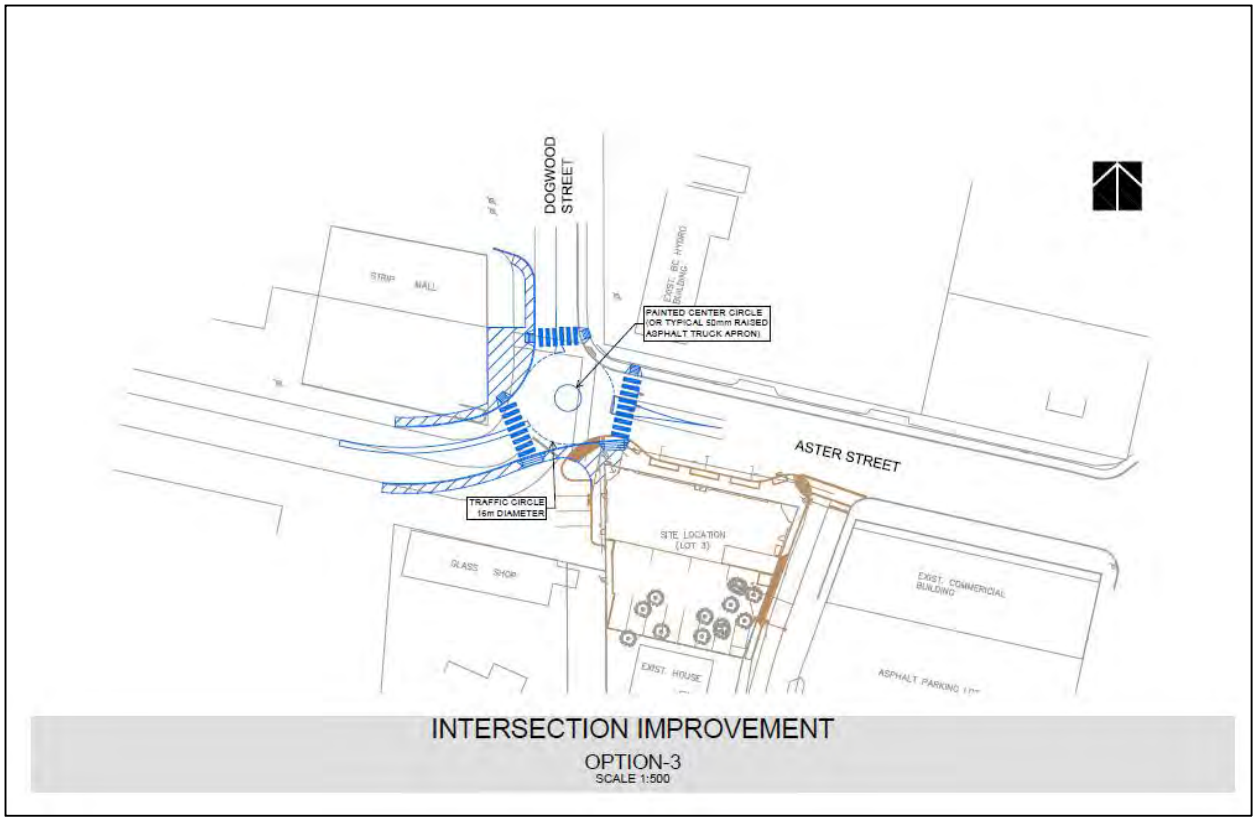

Figure 3: Painted Centre Traffic Circle Configuration

Option 4: Modern Roundabout

The Modern Roundabout option will expect to see north, east, and west approaches with single lanes entering and exiting the roundabout. Each approach is expected to have pedestrian crosswalks with islands separating the inbound and outbound traffic from the roundabout. To construct the Modern Roundabout option, a large amount of adjacent property is expected to be required.

It is expected that the operations of the Modern Roundabout Configuration will be identical to that of the Painted Centre Traffic Circle, as both options include the same configuration on all approaches.

The Modern Roundabout configuration was provided by the Village and is shown in **Figure 4**.

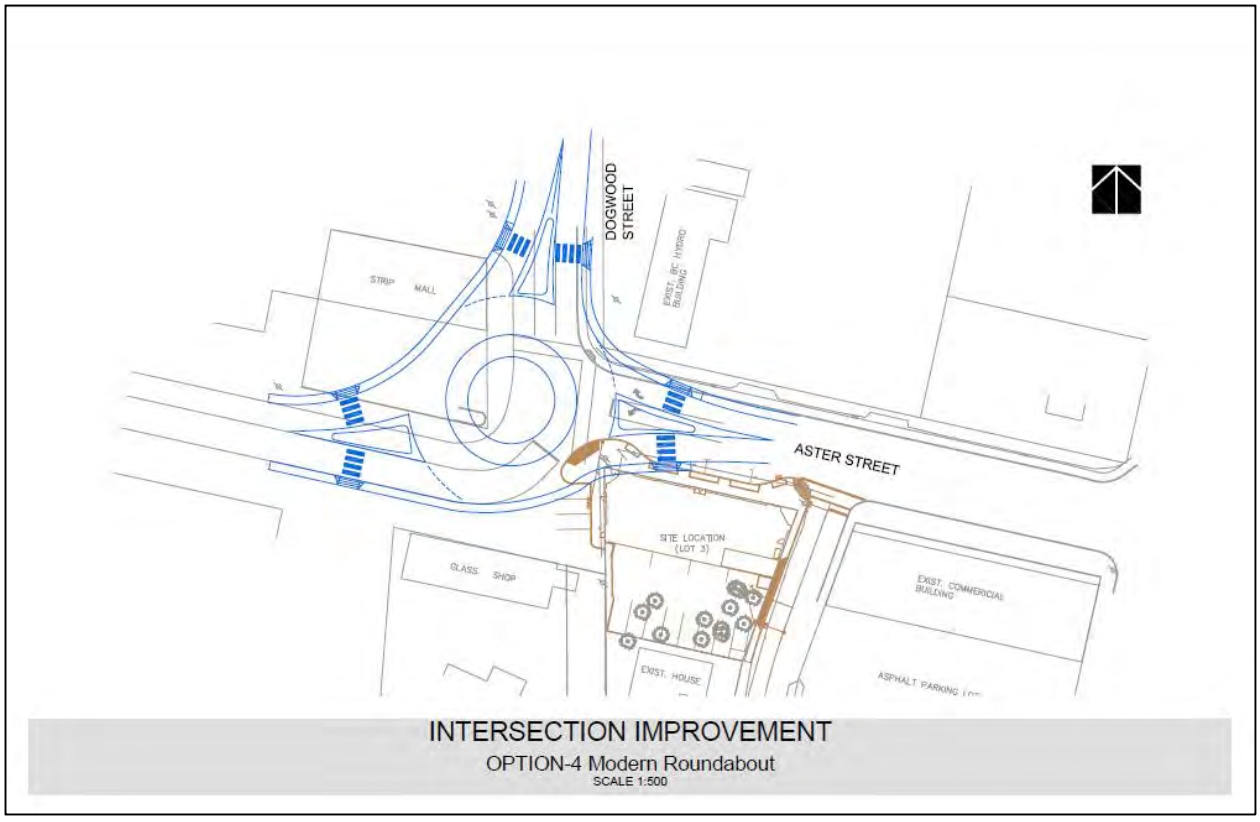

Figure 4: Modern Roundabout Configuration

FINDINGS

The Village may consider the All-Way Stop-Control for improvements to the existing Aster Street and Dogwood Street intersection. Based on the information provided by the Village, this option will require the least amount of adjacent property acquisition for construction. This option is also expected to provide safer operations for vehicles, pedestrians, and cyclists compared to the existing configuration options while still maintaining LOS A for all turning movements. In addition, for the driveway access to the study development, the civil designer should ensure that adequate sightlines are available to the egress traffic from the proposed development.

While the Painted Centre Traffic Circle and Modern Roundabout options would also provide safer operations, the All-Way Stop-Control configuration was selected as the preferred configuration, given the low traffic volumes at this intersection.

The traffic analysis software output summary reports from Synchro and Sidra are provided in **Appendix D-2** and **Appendix D-3** respectively.

APPENDIX D-1

PROPOSED INTERSECTION IMPROVEMENT OPTIONS

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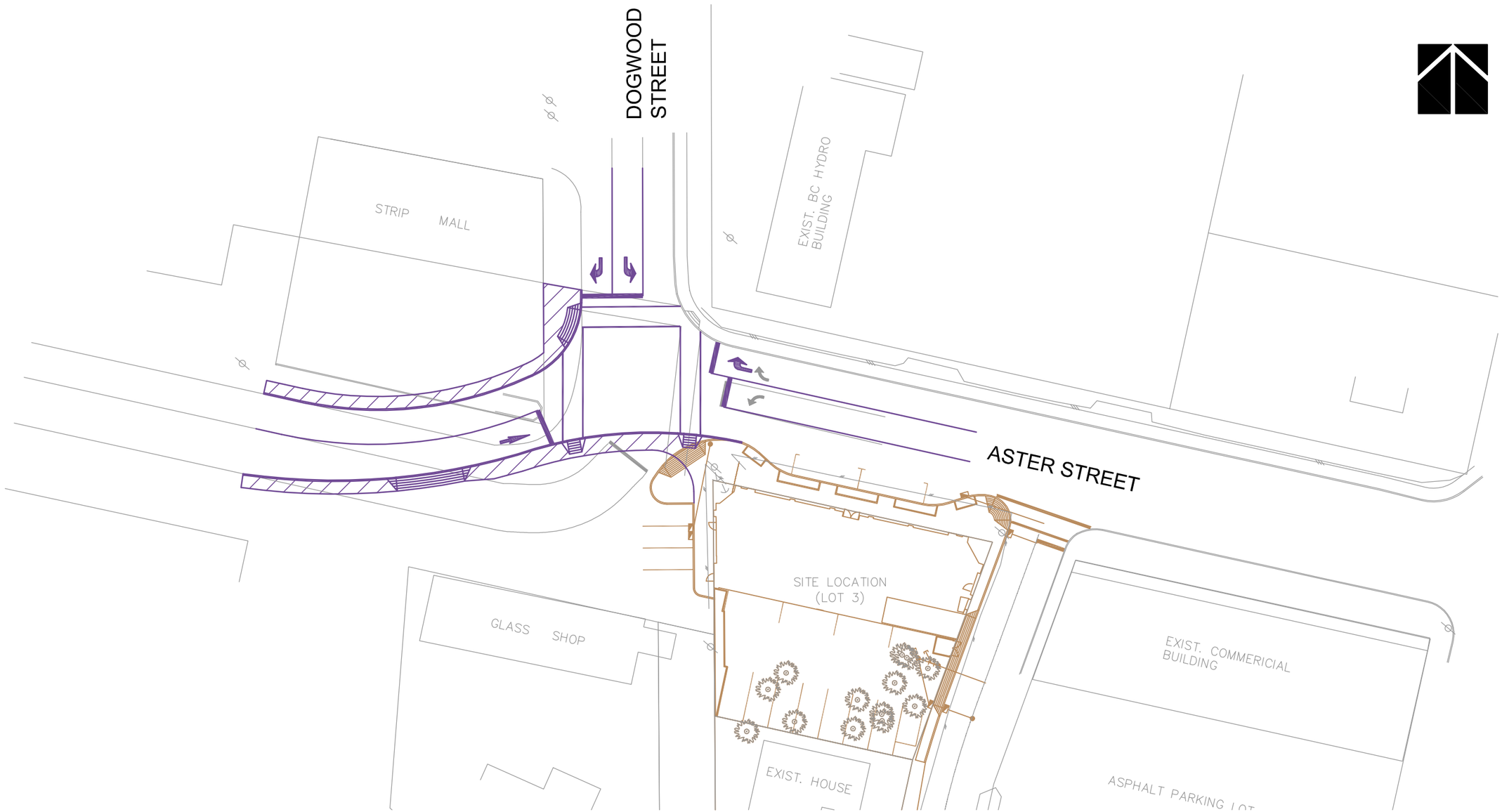
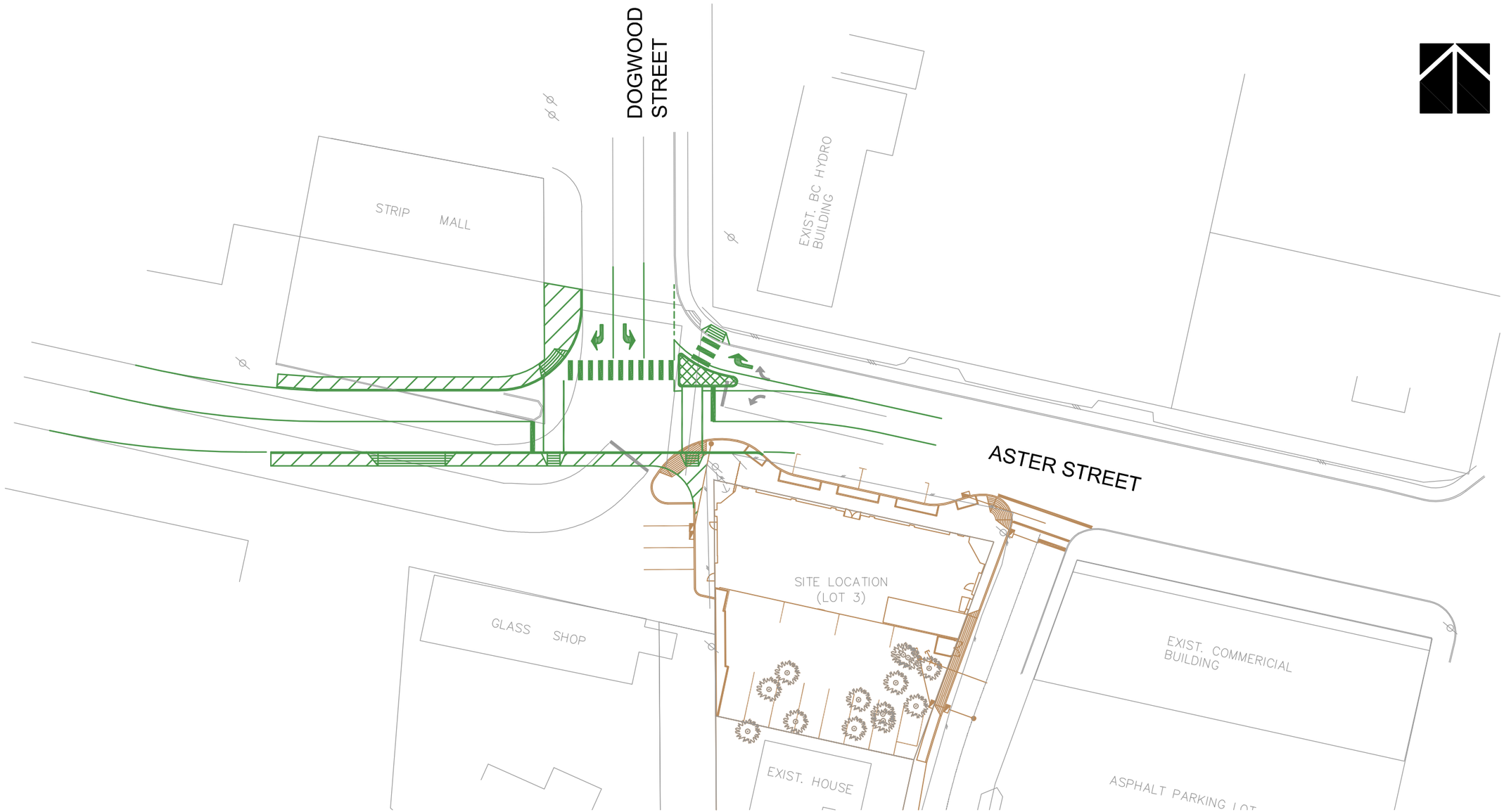


INTERSECTION IMPROVEMENT

OPTION-1

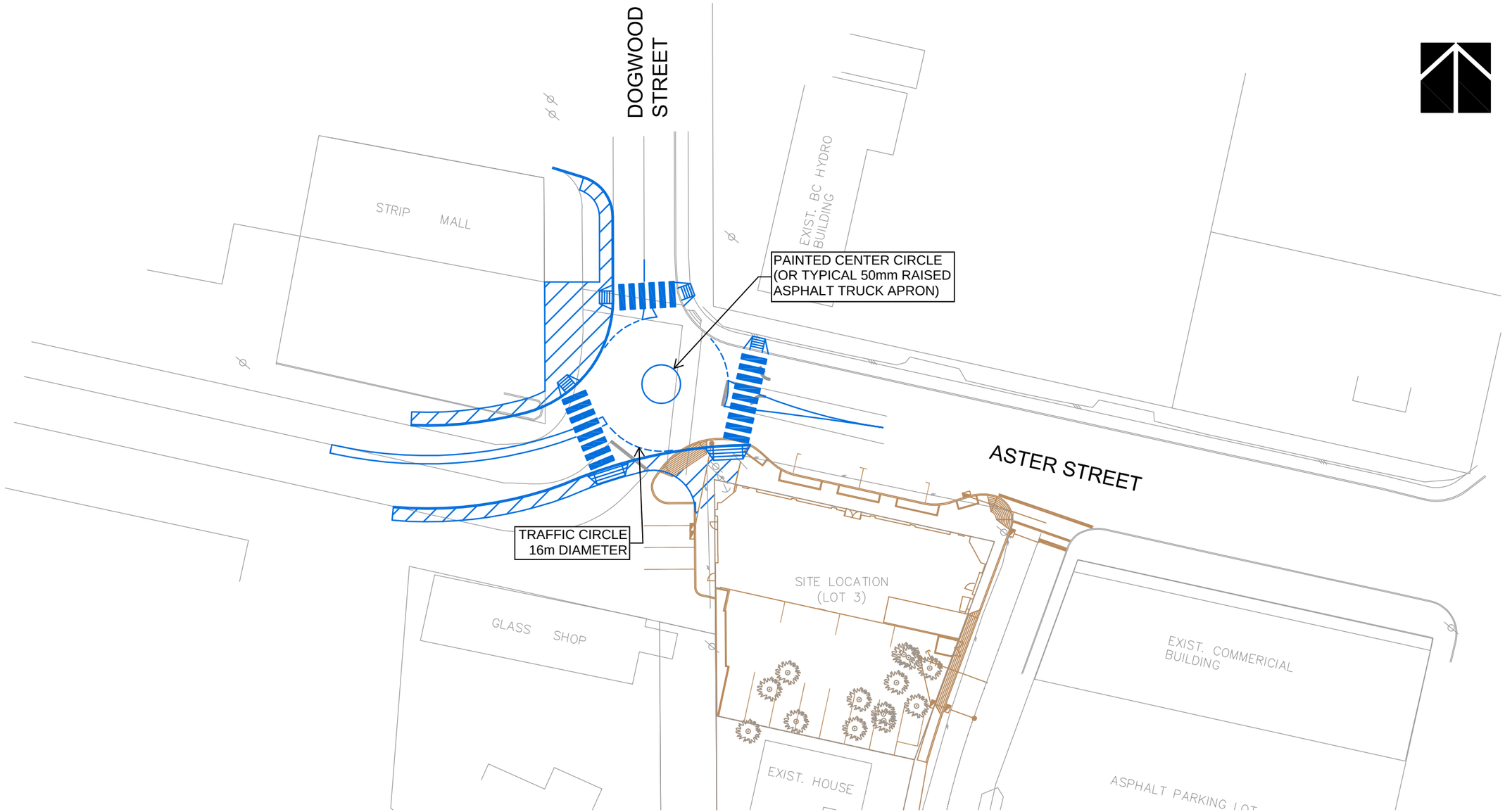
SCALE 1:500



INTERSECTION IMPROVEMENT

OPTION-2

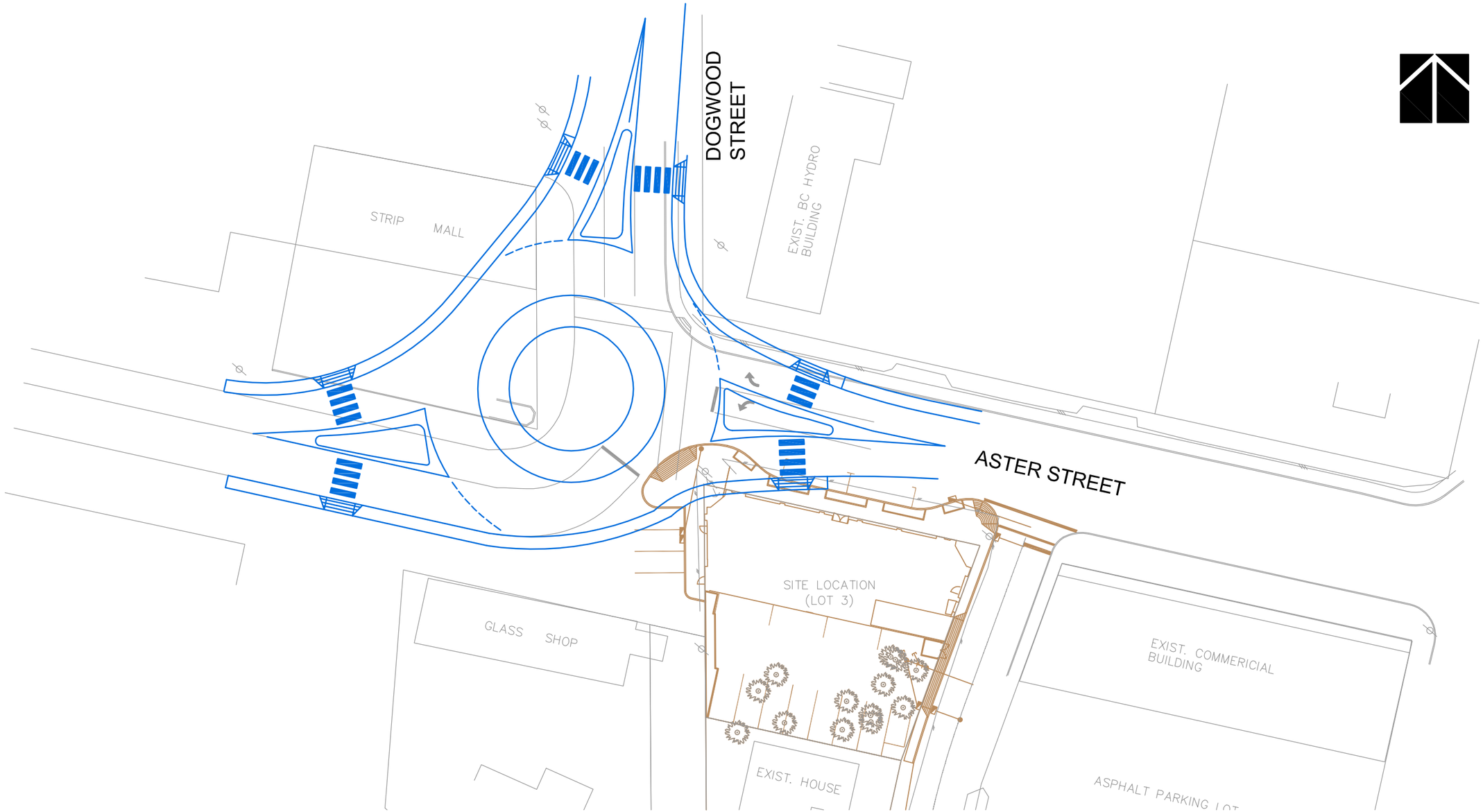
SCALE 1:500



INTERSECTION IMPROVEMENT

OPTION-3

SCALE 1:500



INTERSECTION IMPROVEMENT

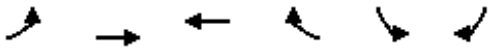
OPTION-4 Modern Roundabout

SCALE 1:500

APPENDIX D-2

SYNCHRO ANALYSIS RESULTS

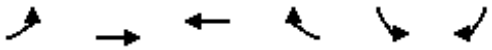
BINNIE



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Stop	Stop		Stop	
Traffic Volume (vph)	0	22	28	25	39	0
Future Volume (vph)	0	22	28	25	39	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	24	30	27	42	0

Direction, Lane #	EB 1	WB 1	WB 2	SB 1	SB 2
Volume Total (vph)	24	30	27	42	0
Volume Left (vph)	0	0	0	42	0
Volume Right (vph)	0	0	27	0	0
Hadj (s)	0.03	0.03	-0.67	0.53	0.00
Departure Headway (s)	4.5	4.7	4.0	5.2	4.7
Degree Utilization, x	0.03	0.04	0.03	0.06	0.00
Capacity (veh/h)	784	760	884	672	900
Control Delay (s)	7.6	6.7	5.9	7.4	6.5
Approach Delay (s)	7.6	6.3		7.4	
Approach LOS	A	A		A	

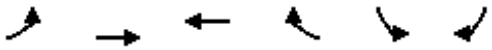
Intersection Summary			
Delay	6.9		
Level of Service	A		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	8	53	52	8	1	1
Future Volume (Veh/h)	8	53	52	8	1	1
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	58	57	9	1	1
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	66				138	62
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	66				138	62
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				100	100
cM capacity (veh/h)	1536				851	1004

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	67	66	2
Volume Left	9	0	1
Volume Right	0	9	1
cSH	1536	1700	921
Volume to Capacity	0.01	0.04	0.00
Queue Length 95th (m)	0.1	0.0	0.0
Control Delay (s)	1.0	0.0	8.9
Lane LOS	A		A
Approach Delay (s)	1.0	0.0	8.9
Approach LOS			A

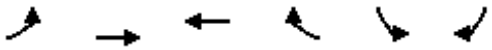
Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	19.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Stop	Stop		Stop	
Traffic Volume (vph)	0	53	35	31	23	1
Future Volume (vph)	0	53	35	31	23	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	58	38	34	25	1

Direction, Lane #	EB 1	WB 1	WB 2	SB 1	SB 2
Volume Total (vph)	58	38	34	25	1
Volume Left (vph)	0	0	0	25	0
Volume Right (vph)	0	0	34	0	1
Hadj (s)	0.03	0.03	-0.67	0.53	-0.67
Departure Headway (s)	4.5	4.6	3.9	5.3	4.1
Degree Utilization, x	0.07	0.05	0.04	0.04	0.00
Capacity (veh/h)	793	766	892	653	837
Control Delay (s)	7.8	6.7	5.9	7.3	5.9
Approach Delay (s)	7.8	6.3		7.3	
Approach LOS	A	A		A	

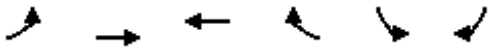
Intersection Summary			
Delay	7.0		
Level of Service	A		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	1	75	58	2	6	8
Future Volume (Veh/h)	1	75	58	2	6	8
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	82	63	2	7	9
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	65				148	64
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	65				148	64
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	99
cM capacity (veh/h)	1537				844	1000

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	83	65	16
Volume Left	1	0	7
Volume Right	0	2	9
cSH	1537	1700	925
Volume to Capacity	0.00	0.04	0.02
Queue Length 95th (m)	0.0	0.0	0.4
Control Delay (s)	0.1	0.0	9.0
Lane LOS	A		A
Approach Delay (s)	0.1	0.0	9.0
Approach LOS			A

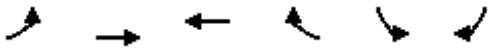
Intersection Summary			
Average Delay		0.9	
Intersection Capacity Utilization		14.7%	ICU Level of Service A
Analysis Period (min)		15	



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	22	28	25	39	0
Future Volume (Veh/h)	0	22	28	25	39	0
Sign Control		Stop	Stop		Free	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	24	30	27	42	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	99	84	84	0	0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	99	84	84	0	0	
tC, single (s)	7.1	6.5	6.5	6.2	4.1	
tC, 2 stage (s)						
tF (s)	3.5	4.0	4.0	3.3	2.2	
p0 queue free %	100	97	96	98	97	
cM capacity (veh/h)	819	785	785	1085	1623	

Direction, Lane #	EB 1	WB 1	WB 2	SB 1	SB 2
Volume Total	24	30	27	42	0
Volume Left	0	0	0	42	0
Volume Right	0	0	27	0	0
cSH	785	785	1085	1623	1700
Volume to Capacity	0.03	0.04	0.02	0.03	0.00
Queue Length 95th (m)	0.7	0.9	0.6	0.6	0.0
Control Delay (s)	9.7	9.8	8.4	7.3	0.0
Lane LOS	A	A	A	A	
Approach Delay (s)	9.7	9.1		7.3	
Approach LOS	A	A			

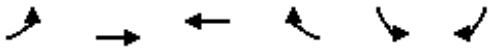
Intersection Summary			
Average Delay	8.6		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	8	53	52	8	1	1
Future Volume (Veh/h)	8	53	52	8	1	1
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	58	57	9	1	1
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	66				138	62
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	66				138	62
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				100	100
cM capacity (veh/h)	1536				851	1004

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	67	66	2
Volume Left	9	0	1
Volume Right	0	9	1
cSH	1536	1700	921
Volume to Capacity	0.01	0.04	0.00
Queue Length 95th (m)	0.1	0.0	0.0
Control Delay (s)	1.0	0.0	8.9
Lane LOS	A		A
Approach Delay (s)	1.0	0.0	8.9
Approach LOS			A

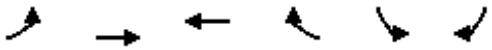
Intersection Summary			
Average Delay		0.6	
Intersection Capacity Utilization		19.5%	ICU Level of Service A
Analysis Period (min)		15	



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	53	35	31	23	1
Future Volume (Veh/h)	0	53	35	31	23	1
Sign Control		Stop	Stop		Free	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	58	38	34	25	1
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	69	50	51	0	0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	69	50	51	0	0	
tC, single (s)	7.1	6.5	6.5	6.2	4.1	
tC, 2 stage (s)						
tF (s)	3.5	4.0	4.0	3.3	2.2	
p0 queue free %	100	93	95	97	98	
cM capacity (veh/h)	853	828	827	1085	1623	

Direction, Lane #	EB 1	WB 1	WB 2	SB 1	SB 2
Volume Total	58	38	34	25	1
Volume Left	0	0	0	25	0
Volume Right	0	0	34	0	1
cSH	828	827	1085	1623	1700
Volume to Capacity	0.07	0.05	0.03	0.02	0.00
Queue Length 95th (m)	1.7	1.1	0.7	0.4	0.0
Control Delay (s)	9.7	9.6	8.4	7.3	0.0
Lane LOS	A	A	A	A	
Approach Delay (s)	9.7	9.0		7.0	
Approach LOS	A	A			

Intersection Summary			
Average Delay	8.9		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	1	75	58	2	6	8
Future Volume (Veh/h)	1	75	58	2	6	8
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	82	63	2	7	9
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	65				148	64
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	65				148	64
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	99
cM capacity (veh/h)	1537				844	1000

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	83	65	16
Volume Left	1	0	7
Volume Right	0	2	9
cSH	1537	1700	925
Volume to Capacity	0.00	0.04	0.02
Queue Length 95th (m)	0.0	0.0	0.4
Control Delay (s)	0.1	0.0	9.0
Lane LOS	A		A
Approach Delay (s)	0.1	0.0	9.0
Approach LOS			A

Intersection Summary			
Average Delay		0.9	
Intersection Capacity Utilization		14.7%	ICU Level of Service A
Analysis Period (min)		15	

APPENDIX D-3

SIDRA ANALYSIS RESULTS

BINNIE

MOVEMENT SUMMARY

Site: Aster Street & Dogwood Street (Options 3 & 4) - AM Peak

BCH Pemberton Field Office
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Aster St											
6	T1	30	2.0	0.052	3.7	LOS A	0.2	1.4	0.01	0.00	38.6
16	R2	27	2.0	0.052	3.7	LOS A	0.2	1.4	0.01	0.00	35.5
Approach		58	2.0	0.052	3.7	LOS A	0.2	1.4	0.01	0.00	37.1
North: Dogwood St											
7	L2	42	2.0	0.040	3.7	LOS A	0.1	1.1	0.11	0.03	28.3
14	R2	1	2.0	0.040	3.7	LOS A	0.1	1.1	0.11	0.03	31.1
Approach		43	2.0	0.040	3.7	LOS A	0.1	1.1	0.11	0.03	28.4
West: Aster St											
5	L2	1	2.0	0.024	3.6	LOS A	0.1	0.6	0.13	0.04	32.0
2	T1	24	2.0	0.024	3.6	LOS A	0.1	0.6	0.13	0.04	38.8
Approach		25	2.0	0.024	3.6	LOS A	0.1	0.6	0.13	0.04	38.5
All Vehicles		126	2.0	0.052	3.7	LOS A	0.2	1.4	0.07	0.02	33.5

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: Aster Street & Dogwood Street (Options 3 & 4) - PM Peak

BCH Pemberton Field Office
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Aster St											
6	T1	38	2.0	0.065	3.8	LOS A	0.2	1.8	0.01	0.00	38.4
16	R2	34	2.0	0.065	3.8	LOS A	0.2	1.8	0.01	0.00	35.4
Approach		72	2.0	0.065	3.8	LOS A	0.2	1.8	0.01	0.00	36.9
North: Dogwood St											
7	L2	25	2.0	0.024	3.6	LOS A	0.1	0.6	0.12	0.04	28.4
14	R2	1	2.0	0.024	3.6	LOS A	0.1	0.6	0.12	0.04	31.3
Approach		26	2.0	0.024	3.6	LOS A	0.1	0.6	0.12	0.04	28.6
West: Aster St											
5	L2	1	2.0	0.054	3.8	LOS A	0.2	1.5	0.09	0.03	31.8
2	T1	58	2.0	0.054	3.8	LOS A	0.2	1.5	0.09	0.03	38.7
Approach		59	2.0	0.054	3.8	LOS A	0.2	1.5	0.09	0.03	38.5
All Vehicles		157	2.0	0.065	3.8	LOS A	0.2	1.8	0.06	0.02	35.6

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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PHASE 1 ENVIRONMENTAL SITE ASSESSMENT

Keystone Environmental
Knowledge-Driven Results

February 20, 2017

Mr. David Maté
WSP Canada Inc.
Unit #100 - 20339 96 Avenue
Langley, BC V1M 0E4

Dear Mr. Maté:

Re: Revised Report of Findings – Phase I Environmental Site Assessment
BCH Pemberton Field Office – 1363 Aster Street, Pemberton, BC
Project No. 13360

Please find enclosed the report titled *Revised Report of Findings – Phase I Environmental Site Assessment, BCH Pemberton Field Office – 1363 Aster Street, Pemberton, BC*. We are pleased to submit this report to WSP Canada Inc.

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

Sincerely,

Keystone Environmental Ltd.

Original signed by

Michael Geraghty, M.Sc., P. Geo., PMP
Senior Technical Manager

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encl.

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Canada V5G 4G3

Telephone: 604 430 0671
Facsimile: 604 430 0672
info@KeystoneEnviro.com
KeystoneEnviro.com

Keystone Environmental
Knowledge-Driven Results

REVISED REPORT OF FINDINGS
PHASE I
ENVIRONMENTAL SITE ASSESSMENT

BCH Pemberton Field Office
1363 Aster Street
Pemberton, BC

Prepared for:

WSP CANADA INC.
Unit #100 - 20339 96 Avenue
Langley, BC V1M 0E4

Prepared by:

KEYSTONE ENVIRONMENTAL LTD.
Suite 320 – 4400 Dominion Street
Burnaby, BC V5G 4G3

Telephone: 604-430-0671
Facsimile: 604-430-0672
www.keystoneenvironmental.ca

Project No. 13360

February 2017

EXECUTIVE SUMMARY

This KEYSTONE ENVIRONMENTAL™ Phase I Environmental Site Assessment (ESA) report, prepared at the request of WSP Canada Inc. was conducted for the property referenced as 1363 Aster Street, in the Resort Municipality of Pemberton, BC (the Site). The area of the Site is approximately 5,200 m^2. The Site is currently occupied by a BC Hydro storage and workshop facility.

ON-SITE SUMMARY

Historical records indicate that the Site was vacant and vegetated from the early 1950s, or earlier to the late-1950s, when the existing Site building was constructed on the southwest portion of the Site. Given the age of the existing Site building, it is anticipated that BC Hydro has occupied the Site since it was first developed in the late 1950s.

The existing building is heated via electric ceiling mounted heaters. Since a former ground-level furnace, heating oil aboveground/underground storage tanks, and/or associated piping were not observed, it is anticipated that the Site building has been heated by the ceiling-mounted heaters since its construction in the 1950s. Therefore; there is considered to be a low potential for a heating oil UST and/or hydrocarbon contamination associated with heating oil to be located on the Site.

Mr. David Maté, a representative of WSP Canada Inc. reported that the pole bunks on the north portion of the property are likely contaminated and are planned to be removed from the Site. Due to the heavy snow cover on the north portion of the Site during the Site reconnaissance, the extent of potential contamination could not be evaluated. However, based on the nature of the potential contamination source, it is anticipated that potential contamination, if any, is surficial and localized to the immediate vicinity of the pole bunks. Therefore there is considered to be a low potential for widespread contamination associated with the pole bunks.

During the Site reconnaissance, four 10 L pails of cable lubricant, three 5 L pails of fuel, five 5 L pails of motor oil, two 19 L pails of transmission fluid, and 26 industrial rolls of metal cable wiring were observed on the Site. It is anticipated that minor electric and automotive work are conducted on-Site. However, given that the items were stored over concrete, that the workshop portions of the Site were located indoors over concrete and that waste oil and scrap metals were observed to be discarded in waste drums/bins, there is considered to be a low potential for constituents of concern, associated with the existing operation to be present in the Site soil, groundwater, and/or vapour at concentrations greater than the applicable Contaminated Sites Regulation (CSR) land and water use standards.

OFF-SITE SUMMARY

The properties located in the vicinity of the Site have been primarily commercial and residential since the 1950s. Two off-Site properties located in the vicinity of the Site were identified to having been occupied by operations of potential environmental concern. However, based on the down-gradient or cross-gradient orientations to the Site, the distance to the Site, operations

likely being conducted indoors over concrete, and/or information obtained through the MOE Site Registry, there is considered to be a low potential for these two off-Site properties to have contributed constituents of concern to the Site soil, groundwater, and/or vapour at concentrations exceeding the CSR land and water use standards.

CONCLUSION

With the exception of hydrocarbon contamination to be present in the vicinity of the pole bunks, if any, there is considered to be a low potential for constituents of concern to be present in the Site soil, groundwater, and/or vapour at concentrations greater than the applicable CSR land and water use standards.

It is understood that the Site is intended to be redeveloped in the near future. In our experience, in a majority of cases, contamination associated with the pole bunks would be minor and localized to the vicinity of the pole bunks; therefore, further investigation associated with the pole bunks is not warranted at this time, as this matter could be dealt with at the time of Site preparation for redevelopment.

This Executive Summary is subject to the same general limitations as contained in the report and must be read in conjunction with the entire report.

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LIST OF APPENDED TABLES

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APEC	AREA OF POTENTIAL ENVIRONMENTAL CONCERN
AST	ABOVEGROUND STORAGE TANK
AW	AQUATIC LIFE WATER USE (SITE SPECIFIC)
BGS	BELOW GROUND SURFACE
BH	BOREHOLE
BTEX	BENZENE, TOLUENE, ETHYLBENZENE AND XYLENE
CCME	CANADIAN COUNCIL OF MINISTERS OF THE ENVIRONMENT
CL	COMMERCIAL LAND USE (SITE SPECIFIC)
COC	CERTIFICATE OF COMPLIANCE
CSR	CONTAMINATED SITES REGULATION
DNAPL	DENSE NON-AQUEOUS PHASE LIQUIDS
DSI	DETAILED SITE INVESTIGATION
DW	DRINKING WATER USE (SITE SPECIFIC)
EH	EXTRACTABLE HYDROCARBONS
EM	ELECTROMAGNETIC
EMA	ENVIRONMENTAL MANAGEMENT ACT
EPH	EXTRACTABLE PETROLEUM HYDROCARBONS
ERA	ECOLOGICAL RISK ASSESSMENT
ESA	ENVIRONMENTAL SITE ASSESSMENT
GPR	GROUND PENETRATING RADAR
HEPH	HEAVY EXTRACTABLE PETROLEUM HYDROCARBONS IN SOILS
$HEPH_W$	HEAVY EXTRACTABLE PETROLEUM HYDROCARBONS IN GROUNDWATER
HHERA	HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
HWR	HAZARDOUS WASTE REGULATION
IL	INDUSTRIAL LAND USE (SITE SPECIFIC)
IW	IRRIGATION WATER USE (SITE SPECIFIC)
LEPH	LIGHT EXTRACTABLE PETROLEUM HYDROCARBONS IN SOILS
$LEPH_W$	LIGHT EXTRACTABLE PETROLEUM HYDROCARBONS IN GROUNDWATER
LNAPL	LIGHT NON-AQUEOUS PHASE LIQUIDS
LW	LIVESTOCK WATER USE (SITE SPECIFIC)
MBG	METRES BELOW GRADE
MBGS	METRES BELOW GROUND SURFACE
MOE	MINISTRY OF ENVIRONMENT
MTBE	METHYL TERTIARY BUTYL ETHER
MW	MONITORING WELL

LIST OF ACRONYMS (CONT'D)

NAPL	NON-AQUEOUS PHASE LIQUID
NS	NO STANDARD
NWU	NO WATER USE (SITE SPECIFIC)
OWS	OIL/WATER SEPARATOR
PAH(S)	POLYCYCLIC AROMATIC HYDROCARBONS
PCB(S)	POLYCHLORINATED BIPHENYLS
PCOC(S)	POTENTIAL CONSTITUENT(S) OF CONCERN
PERC	PERCHLOROETHYLENE
PL	URBAN PARK LAND USE (SITE SPECIFIC)
PPM	PARTS PER MILLION
PSI 1	PRELIMINARY SITE INVESTIGATION – STAGE 1
PSI 2	PRELIMINARY SITE INVESTIGATION – STAGE 2
PST	PETROLEUM STORAGE TANK SITES
QA/QC	QUALITY ASSURANCE/QUALITY CONTROL
RL	RESIDENTIAL LAND USE (SITE SPECIFIC)
RPD	RELATIVE PERCENTAGE DIFFERENCE
SRR	SPILL REPORTING REGULATION
SSI	SUPPLEMENTAL SITE INVESTIGATION
TP	TEST PIT
UFFI	UREA FORMALDEHYDE FOAM INSULATION
UL	URBAN PARK LAND USE (SITE SPECIFIC)
USEPA	ENVIRONMENTAL PROTECTION AGENCY (U.S.)
UST	UNDERGROUND STORAGE TANK
VH_W	VOLATILE HYDROCARBONS IN GROUNDWATER
VOC(S)	VOLATILE ORGANIC COMPOUNDS
VPH	VOLATILE PETROLEUM HYDROCARBONS IN SOILS
VPH_W	VOLATILE PETROLEUM HYDROCARBONS IN GROUNDWATER
WQG	WATER QUALITY GUIDELINES

1. INTRODUCTION

This KEYSTONE ENVIRONMENTAL LTD™ Phase I Environmental Site Assessment (ESA) was prepared at the request of WSP Canada Inc. for the property currently referenced as 1363 Aster Street, in the Resort Municipality of Pemberton, BC (the Site). The Site location is shown on Figure 1 and selected representative photographs of the Site are included in Appendix A.

This Phase I ESA was conducted to determine the potential for constituents of concern to be present in the soil, groundwater and/or vapour at the Site at concentrations exceeding the BC Contaminated Sites Regulation (CSR) land and water use standards. It is understood that this report will be used for due diligence purposes prior to the potential redevelopment of the Site.

1.1 Site Identification

The Site consists of one legal lot identified as follows:

Current Civic Addresses:	1363 Aster Street, Pemberton, BC
Parcel Identifier:	003-621-791
Legal Description:	Lot 5 District Lot 203 Lillooet District Plan 31658
Current Registered Owner:	British Columbia Hydro and Power Authority
Current Zoning:	C-1 – Commercial Town Centre
Site Area:	5,200 m^2 (approximate)
Latitude:	50º 19’ 18.4” North (approximate)
Longitude:	122º 48’ 33.2” West (approximate)

The approximate latitude and longitude entered for the Site was determined from the BC Water Resources Atlas (http://maps.gov.bc.ca/ess/sv/wrbc/)

1.2 Scope of Work

The scope of work for this study was conducted in general accordance with the requirements of the Canadian Standards Association (CSA) Phase I ESA standards as outlined in the CSA publication Z768-01 and included the following tasks:

- A review of historical records including aerial photographs, the BC Ministry of Environment (MOE) on-line Site Registry, the BC Water Resources Atlas, and a current land title. Street directories, fire insurance maps, and land use maps were not available for the vicinity of the Site.

- A Site reconnaissance to observe Site conditions which may indicate the potential presence of contamination and to prepare a photographic record.
- Interviews with individuals knowledgeable about the vicinity of Site.
- A review of documents and reports relating to waste management and site contamination.
- A preliminary building survey for special attention substances such as asbestos, polychlorinated biphenyls (PCBs), and urea formaldehyde foam insulation (UFFI) which may be present in construction materials at the Site.

The following previous documents were provided for review:

- *2011 Asbestos Re-Assessment, BC Hydro Pemberton District Office, 1470 Aster Street, Pemberton BC*, prepared for Kent Hillman, by PHH ARC Environmental, January 25, 2012.
- *Annual Site Assessment,* completed by Bob Herr, July 8, 2014.

1.3 General Limitations

Findings presented in this report are based upon (i) a limited visual review of accessible areas of the Site building and surrounding grounds, (ii) interviews with personnel familiar with Site activities, and (iii) a review of Site, environmental agency and historical archive records. Sampling and analysis of wastes, water, soil, groundwater or air was not conducted as part of this review. Consequently, while findings and conclusions documented in this report have been prepared in a manner consistent with that level of care and skill normally exercised by other members of the environmental science and engineering profession practising under similar circumstances in the area at the time of the performance of the work, this report is not intended nor is it able to provide a totally comprehensive review of past or present Site environmental conditions. This report is intended to provide information to reduce, but not necessarily eliminate, uncertainty regarding the potential for contamination of a property. Where this potential has been identified, the further reduction of uncertainty requires the performance of a Phase II ESA.

This report has been prepared solely for the internal use of WSP Canada Inc. and BC Hydro, pursuant to the agreement between Keystone Environmental Ltd. and WSP Canada Inc. A copy of the general terms and conditions associated with this agreement is attached in Appendix D. By using the report, WSP Canada Inc. and BC Hydro agree that they will review and use the report in its entirety. Any use which other parties make of this report, or any reliance on or decisions made based on it, are the responsibility of such parties. Keystone Environmental Ltd. accepts no responsibility for damages, if any, suffered by other parties as a result of decisions made or actions based on this report.

2. PROPERTY DESCRIPTION

The Site consists of one legal lot located on the northwest corner of the intersection between Aster Street and Dogwood Street, in the village of Pemberton, BC. The area of the Site is approximately 5,200 m^2. The Site is currently occupied by a BC Hydro storage and workshop facility.

The Site is bordered to the north and west by residences, to the south (across Aster Street) by offices and to the east by a retail mall. The Site and properties located in the vicinity of the Site are shown on Figure 1. Selected representative photographs of the Site are included in Appendix A.

2.1 Surficial Geology

The local surficial geology of the area was determined by consulting a Geological Survey of Canada Map 5324 (2008). The surficial geology of the Site consists of fan sediments, which are poorly sorted sand and gravel, with diamicton, generally 2 to 15 m thick.

2.2 Hydrogeology

Groundwater is expected to follow topography, flowing from areas of higher elevation to areas of lower elevation. Local groundwater flow direction may vary as a result of local conditions such as topography, geology and the presence of drainage channels and buried utilities, and is subject to confirmation with field measurements. The local topography at the Site is sloped towards the southeast (at an approximate grade of 4%). Based on the local topography, the groundwater flow direction at the Site is inferred to be towards the southeast; therefore, it is anticipated that groundwater flows to the Site from adjacent properties and from up-gradient properties to the northwest of the Site.

The closest surface water body is Pemberton Creek, located approximately 120 m southwest of the Site.

3. RECORDS REVIEW

Various documents were reviewed for information concerning past uses of, and activities at the Site and properties located in the vicinity of the Site. Based on the topography in the area (refer to Section 2.2), the vicinity of the Site is defined as approximately 120 m northwest, 100 m northeast and southwest, and 70 m southeast from the Site. The documents reviewed for information concerning historical land use include aerial photographs, the MOE Site Registry, and the BC Water Resources Atlas. Street directories, fire insurance maps, and land use maps were not compiled for the vicinity of the Site.

3.1 Aerial Photographs

Aerial photographs, dated 1950, 1958, 1962, 1971, 1975, 1980, 1986, 1990, 1994, 2005, 2013, and 2015[1] were reviewed for information concerning historical physical features and land use on the Site and properties in the vicinity of the Site. A summary of the observations made on the Site during the aerial photograph review is listed in Table 1.

The properties located within the vicinity of the Site have been primarily residential since the 1940s. A summary of the off-Site observations is listed in Table 2.

3.2 Ministry of Environment Site Registry Search

An on-line search of the MOE Site Registry was conducted to determine if it contained information regarding soil, groundwater and/or vapour contamination for properties within a 1 km^2 area of the Site. The search was centred on 50º 19' 18.4" North by 122º 48' 33.2" West, the approximate latitude and longitude entered for the area of the Site. A copy of the search results is provided in Appendix C.

At the time of the on-line search (February 14, 2017), the Site Registry had been updated to February 12, 2017. The Site is not listed. Five off-Site properties were listed in the Site Registry; two of which were located within the vicinity and are discussed in detail below.

- Site ID 3761: 7410 and 7414 Prospect Street (currently 1380 Aster Street), located approximately 60 m southeast and down-gradient of the Site
- Site ID 4776: 7432 Prospect Street, located approximately 55 m northeast and cross-gradient of the Site

Site ID 3761: 7410 and 7414 Prospect Street

The Detail Report for the property located at 7410 and 7414 Prospect Street (currently 1380 Aster Street), approximately 60 m southeast and down-gradient of the Site, was obtained and indicated the following:

- The property was registered in May 1998 and updated in July 2001.

[1] The 2013 and 2015 aerial photographs were obtained from Google Earth.

- A notation indicates that hydrocarbon contamination around a fuel storage shed was evaluated in 1997.
- A remediation completion report was submitted in 1998, however additional confirmatory sampling was required as there were elevated iron and manganese concentrations in the groundwater.

Site ID 4776: 7432 Prospect Street

The Detail Report for the property located at 7432 Prospect Street, located approximately 55 m northeast and cross-gradient of the Site was obtained and indicated the following:

- The property was registered in October 1998 and was updated in October 2003.
- A Notice of Independent Remediation (NIR) initiation was submitted in August 1997. The NIR completion was not reported.

Based on the distances of the remaining three off-Site properties (more than 150 m) to the Site, there is considered to be a low potential for constituents of concern associated with the off-Site properties to be present in the Site soil, groundwater, and/or vapour at concentrations greater than the applicable land and water use CSR standards

3.3 Water Well Search

The BC Water Resource Atlas, which displays groundwater management information for the Province of BC, was accessed on February 14, 2017. A search was conducted to determine if groundwater wells were located within 500 m radius of the Site. Groundwater wells were not identified on the Site. Ten groundwater wells were identified within the search radius. The closest groundwater well (tag no. 74926) was located approximately 55 m east of the Site. The well is owned by "Village of Pemberton," and the well use is listed as "water supply system."

3.4 Previous Documents

The following previous environmental reports were completed for an area which is comprised of the Site and properties adjacent to the Site and were provided for review:

- *2011 Asbestos Re-Assessment, BC Hydro Pemberton District Office, 1470 Aster Street, Pemberton BC*, prepared for Kent Hillman, by PHH ARC Environmental, January 25, 2012.[2]
- *Annual Site Assessment,* completed by Bob Herr, July 8, 2014.
- *Hazardous Building Materials Assessment, Pemberton District Office, 1363 Aster Street, Pemberton BC*, prepared for BC Hydro c/o WSP Canada Inc., by Pinchin West Ltd., December 12, 2016.

[2] The property referenced in the report was mislabeled as 1470 Aster Street. The subject site in the report does however refer to the Site, currently addressed 1363 Aster Street.

2011 Asbestos Re-Assessment by PHH ARC Environmental (PHH)

PHH conducted an asbestos re-assessment for the Site in 2011. Pertinent information is summarized below:

- Asbestos-containing vinyl floor tile was present within the storage room.

2014 Annual Site Assessment

An annual site assessment was completed for the Site in 2014. Pertinent information is summarized below:

- Emergency generators were not located on the Site.
- Septic systems were not located on the Site.
- Activities conducted on the Site could not impact surface water.

2016 Hazardous Building Materials Assessment by Pinchin West Ltd. (Pinchin)

Pinchin conducted a *Hazardous Building Materials Assessment for* the Site in 2016. Pertinent information is summarized below:

- Asbestos-containing materials were not found in the Site building.
- PCBs were not found in the Site building.
- Moult-impacted materials were not found in the building.
- Lead was confirmed present in select paints/surface coatings.
- Crystalline silica was present in various concrete and paved materials on the Site.
- Mercury vapours were present in the fluorescent lamps.
- Ozone-depleting substances may have been present in two window-mounted air conditioner units.

4. SITE RECONNAISSANCE

Keystone Environmental personnel visited the Site on February 3, 2017. The purpose of the visit was to observe operations and conditions at the Site as well as neighboring properties to determine the potential for contamination at the Site and to prepare photographic documentation. Representative photographs taken during the Site reconnaissance are included in Appendix A.

The Site is currently occupied by a BC Hydro storage and workshop facility. The storage shed, workshop areas in the Site building and grounds of the Site were viewed. Stored items, parked vehicles and snow cover limited observations of some of the underlying areas of the Site.

4.1 Grounds Survey

The following was observed by Keystone Environmental during the Site reconnaissance:

- Approximately 15% of the Site is occupied by the Site building and storage shed located on the west portion of the Site and the remaining 85% was occupied by gravel surfaces.
- Vent or fill pipes, which may be indicative of underground storage tanks (USTs), were not observed on the Site.
- Aboveground storage tanks (ASTs), or associated mounting brackets or pads, were not observed on the grounds of the Site.
- Large wooden poles were stored on the north portion of the Site over gravel.
- Two scrap metal bins were observed adjacent and east of the Site building.
- Site drainage was via run-off to storm sewer catch basins as well as infiltration into unpaved portions of the Site.

4.2 Building Survey

The following was observed by Keystone Environmental personnel during the Site reconnaissance.

- The following items were observed to be stored in the storage shed located on the west portion of the Site:
  - Thirteen transformer drums (not in use)
  - Eighteen industrial rolls of metal and copper cable wiring
  - Three approximately 200 L waste oil drums
  - Four approximately 10 L pails of heavy duty cable lubricant
  - The shed had concrete floors. The concrete floors were observed to be in good condition (major cracks and/or floor drains were not observed).

  - The single-storey Site building (located on the southwest portion of the Site) had a slab-on-grade construction. Basements and/or underground parking were not observed on the Site.
- The following items were observed to be stored in the Site building:
  - Various electrical tools
  - Three approximately 5 L pails of fuel
  - Five approximately 5 L pails of motor oil
  - Two 19 L pails of transmission fluid
  - Six industrial rolls of metal and copper cable wiring
  - The building was heated via electrically powered ceiling mounted heaters
  - Three floor drains were observed on the E portion of the Site building
  - The concrete floor in the Site building was observed to be in good condition (major cracks were not observed)

4.3 Special Attention Substances

Based on the age of the Site building (constructed in the late 1950s); the potential for special attention substances such as asbestos, PCBs and/or UFFI to be present are as follows:

- In their 2011 asbestos re-assessment, PHH reported that asbestos-containing vinyl floor tiles were present in the Site building. A subsequent Hazardous Building Materials Assessment conducted by Pinchin in 2016 reported that asbestos-containing materials were not found in the Site building. Therefore it is anticipated that the previously discovered asbestos-containing vinyl floor tiles were removed and that asbestos-containing materials are not currently located on the Site.
- In their 2016 *Hazardous Building Materials Assessment*, Pinchin reported that PCBs were not found in the Site building. Therefore it is anticipated that PCBs are not currently located on the Site.
- Neither the 2016 Pinchin report nor the 2011 PHH report addressed the presence or absence of UFFI to be present in the Site building, Therefore, there is considered to be a potential for UFFI to be present because the majority was installed in new and existing structures in Canada between 1975 and 1978. However, during the Site reconnaissance, injection holes consistent with UFFI injections were not observed.
- In their 2016 *Hazardous Building Materials Assessment*, Pinchin also reported the presence of lead in select paints/surface coatings, silica in various concrete and paved materials and mercury in the fluorescent lamps in the Site building. Mould impacted materials were not found during their assessment.

4.4 Adjacent Properties

The following was observed on the surrounding properties during the Site reconnaissance:

- The properties located in the vicinity of the Site were primarily occupied by residential buildings.
- Black's Hot Wheel's, a tire change operation was observed at 1380 Aster Street, approximately 60 m southeast and down-gradient of the Site. Activities associated with the tire change operation were observed to be conducted indoors over concrete in the building on the east portion of the property.
- A fire station was observed at 1350 Aster Street, approximately 60 m southwest and cross-gradient of the Site.
- AC Gas, a service station was observed at 7432 Prospect Street, approximately 55 m northeast and cross-gradient of the Site. The fuel USTs were observed to be on the east portion of the Site, approximately 85 northeast of the Site.

5. INTERVIEWS

An interview was conducted on February 15, 2017 with a representative of the Village of Pemberton. She reported that the fire station located at 1350 Aster Street does not conduct fuelling on the property.

An interview was conducted on February 14, 2017 with Mr. David Maté, a representative of WSP Canada Inc. He reported that the pole bunks on the north portion of the property are likely contaminated and are planned to be removed from the Site.[3]

[3] Due to the heavy snow cover on the north portion of the Site, the extent of potential contamination could not be evaluated. However, based on the nature of the contamination source, it is anticipated that potential contamination, if any, is surficial and localized to the immediate vicinity of the pole bunks.

6. SUMMARY, DISCUSSION AND CONCLUSIONS

This Phase I ESA was prepared at the request of WSP Canada Inc. for the property referenced as 1363 Aster Street, Pemberton, BC. The area of the Site is approximately 5,200 m^2. The Site is currently occupied by a BC Hydro storage and workshop facility.

6.1 On-Site Summary

Historical records indicate that the Site was vacant and vegetated from the early 1950s, or earlier to the late-1950s, when the existing Site building was constructed on the southwest portion of the Site. Given the age of the existing Site building, it is anticipated that BC Hydro has occupied the Site since it was first developed in the late 1950s.

The existing building is heated via electric ceiling mounted heaters. Since a former ground-level furnace, heating oil AST, UST and/or associated piping was not observed, it is anticipated that the Site building has been heated by the ceiling-mounted heaters since its construction in the 1950s. Therefore; there is considered to be a low potential for a heating oil UST and/or hydrocarbon contamination associated with heating oil to be located on the Site.

Mr. David Maté, a representative of WSP Canada Inc. reported that the pole bunks on the north portion of the property are likely contaminated and are planned to be removed from the Site. Due to the heavy snow cover on the north portion of the Site during the Site reconnaissance, the extent of potential contamination could not be evaluated. However, based on the nature of the potential contamination source, it is anticipated that potential contamination, if any, is surficial and localized to the immediate vicinity of the pole bunks. Therefore there is considered to be a low potential for widespread contamination associated with the pole bunks.

During the Site reconnaissance, four 10 L pails of cable lubricant, three 5 L pails of fuel, five 5 L pails of motor oil, two 19 L pails of transmission fluid, and 26 industrial rolls of metal cable wiring were observed on the Site. It is anticipated that minor electric and automotive work are conducted on-Site. However, given that the items were stored over concrete, that the workshop portions of the Site were located indoors over concrete and that waste oil and scrap metals were observed to be discarded in waste drums/bins, there is considered to be a low potential for constituents of concern, associated with the existing operation to be present in the Site soil, groundwater, and/or vapour at concentrations greater than the applicable CSR land and water use standards.

6.2 Off-Site Summary

The properties located in the vicinity of the Site have been primarily commercial and residential since the 1950s. As shown in Table 2, two off-Site properties located in the vicinity of the Site were identified to having been occupied by operations of potential environmental concern. However, as shown in Table 3, based on the down-gradient or cross-gradient orientations to the Site, the distance to the Site, operations likely being conducted indoors over concrete, and/or information obtained through the MOE Site Registry, there is considered to be a low potential for these two off-Site properties to have contributed constituents of concern to the Site soil, groundwater, and/or vapour at concentrations exceeding the CSR land and water use standards.

6.3 Conclusion

With the exception of surficial contamination to be present in the vicinity of the pole bunks, if any, there is considered to be a low potential for constituents of concern to be present in the Site soil, groundwater, and/or vapour at concentrations greater than the applicable CSR land and water use standards.

It is understood that the Site is intended to be redeveloped in the near future. In our experience, in a majority of cases contamination associated with the pole bunks would be minor and localized to the vicinity of the pole bunks; therefore, further investigation associated with the pole bunks is not warranted at this time, as this matter could be dealt with at the time of Site preparation for redevelopment.

7. PROFESSIONAL STATEMENT

Keystone Environmental Ltd.[4] confirms that this report titled *Revised Report of Findings – Phase I Environmental Site Assessment, BCH Pemberton Field Office – 1363 Aster Street, Pemberton, BC* has been prepared in general accordance with CSA Standard Z768-01.

This report was prepared by Daniel Nastas, reviewed by Michael Geraghty, and is subject to the General Terms and Conditions appended at the end of the report.

February 20, 2017
Date

Original signed by

Daniel Nastas, B.Sc., G.I.T.
Project Geologist

Original signed by

Michael Geraghty, M.Sc., P. Geo., PMP
Senior Technical Manager

[4] Keystone Environmental Ltd.'s corporate address is:
Suite 320 – 4400 Dominion Street, Burnaby, BC V5G 4G3
Telephone: 604-430-0671 / Facsimile: 604-430-0672 / Internet: www.keystoneenviro.com

8. REFERENCES

Aerial photographs dated 1950, 1958, 1962, 1971, 1975, 1980, 1986, 1990, 1994 and 2005 obtained from the Geographic Information Centre, UBC Vancouver.

Aerial photographs dated 2013 and 2015, obtained from Google Earth.

British Columbia Ministry of Environment (MOE) Site Registry; www.bconline.gov.bc.ca.

Current Land Title obtained via the Land Title Survey Authority website: http://www.ltsa.ca/cms/.

Geological Survey of Canada Map 5324 (2008).

Interviews with:

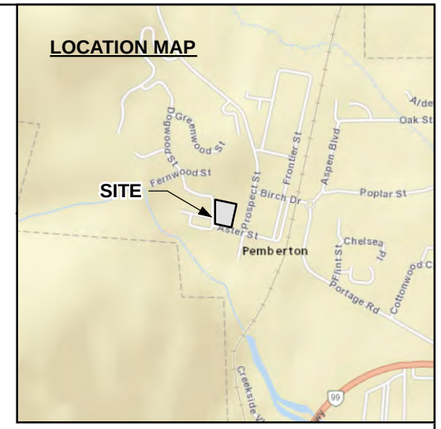
- A representative of the Village of Pemberton
- Mr. David Maté, a representative of WSP Canada Inc.

Previous Documents:

- *2011 Asbestos Re-Assessment, BC Hydro Pemberton District Office, 1470 Aster Street, Pemberton BC*, prepared for Kent Hillman, by PHH ARC Environmental, January 25, 2012.
- *Annual Site Assessment,* completed by Bob Herr, July 8, 2014.

Water well search, British Columbia Water Resources Atlas: http://maps.gov.bc.ca/ess/sv/wrbc/

FIGURE



INFERRED LOCAL GROUNDWATER FLOW DIRECTION

LEGEND

- SITE
- BUILDING OUTLINE
- LOT LINES
- (....) FORMER ADDRESS
- 7432 LISTED ON BC MOE SITE REGISTRY

Keystone Environmental

NOTES:
1. THIS DRAWING IS FOR GENERAL INFORMATION ONLY. LOT BOUNDARIES AND FEATURES ARE APPROXIMATE.
2. DATE OF AERIAL PHOTO IS 2008.

15 0 75 m

SCALE: 1:1,500 (approx.)

1363 Aster Street
Penticton, B C
WSP Canada Inc.

REVISION No.	DATE	PROJECT No.
00	Feb. 2017	13360-01

Figure 1
Location, Site & Surrounding Land Use Plan

DRAWN BY: CY Document Path: I:\13300-13399\13360\Phase 00001 - Phase I ESA\Figs\Fig1-Stage1-R0.mxd

TABLES

Table 1 - On-Site Historical Review Summary

1363 Aster Street, Pemberton, BC

WSP Canada Inc.

Project No. 13360

Address	Aerial Photographs (AP)	
	Years Reviewed: 1950, 1958, 1962, 1971, 1975, 1980, 1986, 1990, 1994, 2005, 2013, and 2015	
On-Site - Aster Street		
1363	1950	Vacant and vegetated
	1958 - 1962	Existing commercial blg on SW portion, former shed on E portion and various equipment stored on the Site
	1971	Existing commercial blg on SW portion, two former sheds on W and E portions and and various equipment stored on the Site
	1975 - 1986	Existing commercial blg on SW portion and former commercial shed on W portion and various equipment stored on the Site
	1990 - 2016	Two existing commercial blgs on W portion and various equipment stored on the Site stored on the Site

Notes & Definitions:

N, E, S, W, C	North, East, South, West, Central
m	Meters
( )	This address is a former address
blg	Building
SFR	Single Family Residence
MFR	Multi Family Residence

Table 2 - Off-Site Historical Review Summary
1363 Aster Street, Pemberton, BC
WSP Canada Inc.
Project No. 13360

Address	Approximate Distance	Operation of Potential Environmental Concern		Aerial Photographs (AP)	
				Years Reviewed: 1950, 1958, 1962, 1971, 1975, 1980, 1986, 1990, 1994, 2005, 2013, and 2015	
Off-Site - Aster Street					
1380 **(7410) Prospect Street** **Site ID** **3761**	60 m SE	2016	Auto Tire Shop	1950 1958 - 1962 1971 - 1990 1994 - 2016	Vacant and vegetated Former SFR on S and W portions Existing commercial blg on C portion and W portion used for parking Two existing commercial blgs on C and E portions and W portion used for parking
Off-Site - Prospect Street					
7432 **Site ID** **4776**	55 m NE	2005 - 2016	Service station	1950 1950 - 1986 1990 1994 2005 - 2016	Vacant Former commercial blg on SE portion Cleared and vacant Existing commercial blgs on S portion and N portion is paved and used for parking Existing commercial blgs on S portion and Existing service station canopy on N portion

Notes & Definitions:

N, E, S, W, C	North, East, South, West, Central
adj.	Adjacent
m	Meters
MOE	Ministry of Environment
blg	Building
BOLD	This property is listed in the MOE Site Registry
( )	This address is a former address
MFR	Multi Family Residence

Table 3 - Off-Site Areas of Potential Environmental Concern
1363 Aster Street, Pemberton, BC
WSP Canada Inc.
Project No. 13360

Address	Approximate Distance	Operation of Potential Environmental Concern	APEC Potential	Rationale
Off-Site - Aster Street				
1380 **(7410) Prospect Street** **Site ID** **3761**	60 m SE	2016 Auto Tire Shop	low	The property is listed on the MOE. The detailed report indicates that hydrocarbon contamination was identified in the vicinity of a fuel storage shed at the Pemberton Forest Service office formerly located on the property. Remediation was completed, however elevated iron and manganese concentrations remained in the groundwater on the property. Aerial photographs indicate that structures have not historically been located on the W portion of the property. Therefore, it is anticipated that the former fuel storage shed and source of the hydrocarbon contamination was located greater than 80 m SE and down-gradient from the Site. During the Site reconnaissance, the existing tire change operation was observed to conduct activities indoors over concrete, approximately 90 m SE and down-gradient from the Site. Therefore, based on the down-gradient distance to the former fuel storage sheds and current operations, there is considered to be a low potential for constituents of concern associated with the property to be present in the Site soil, groundwater, and/or vapour at concentrations greater than the applicable CSR land and water use standards.
Off-Site - Prospect Street				
7432 **Site ID** **4776**	55 m NE	2005 - 2016 Service station	low	The property is listed on the MOE. The detailed report indicates that an NIR initiation was submitted in 1997. A NIR completion was not reported. During the Site reconnaissance, the fuel USTs associated with the service station were observed to be located on the E portion of the property, approximately 85 m NE and cross gradient from the Site. Therefore, based on the distance to the fuel USTs, there is considered to be a low potential for constituents of concern associated with the property to be present in the Site soil, groundwater, and/or vapour at concentrations greater than the applicable CSR land and water use standards.

Notes & Definitions:

N, E, S, W, C	North, East, South, West, Central
adj.	Adjacent
m	Meters
MOE	Ministry of Environment
blg	Building
BOLD	This property is listed in the MOE Site Registry
( )	This address is a former address
MFR	Multi Family Residence

APPENDIX A

PHOTOGRAPHIC DOCUMENTATION

Photograph 1: Site building – looking southwest

Photograph 2: Storage shed on west portion of the Site – looking west

Photograph 3: Pole bunk on northeast portion of the Site – looking north

Photograph 4: Storage of tools on the south portion of the Site building

APPENDIX B

CURRENT LAND TITLE

TITLE SEARCH PRINT 2017-02-17, 10:25:23

File Reference: 13360 Requestor: Mabel Tsand

Declared Value $N/A

CURRENT INFORMATION ONLY - NO CANCELLED INFORMATION SHOWN

Title Issued Under	SECTION 172 LAND TITLE ACT
Land Title District	KAMLOOPS
Land Title Office	KAMLOOPS
Title Number	V52157
From Title Number	S17188
Application Received	1983-08-02
Application Entered	1986-04-11
Title Cancelled	**2016-11-28**

Registered Owner in Fee Simple

Registered Owner/Mailing Address: BRITISH COLUMBIA HYDRO AND POWER AUTHORITY
6TH FLOOR, 1045 HOWE STREET
VANCOUVER, BC
V6Z 2B1

Taxation Authority NORTH SHORE - SQUAMISH VALLEY ASSESSMENT AREA
VILLAGE OF PEMBERTON

Description of Land

Parcel Identifier: 003-621-791

Legal Description:

LOT 5 DISTRICT LOT 203 LILLOOET DISTRICT PLAN 31658

Legal Notations NONE

Charges, Liens and Interests NONE

Duplicate Indefeasible Title NONE OUTSTANDING

Transfers

Registration Date: 2016-11-28

Description: SUBDIVIDED BY PLAN EPP66734 CA5642976

APPENDIX C

MINISTRY OF ENVIRONMENT SITE REGISTRY SEARCH RESULTS

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 As of: FEB 12, 2017       BC Online: Site Registry                    17-02-14
                     For: PF43481  KEYSTONE ENVIRONMENTAL LTD.         17:28:23
 Folio: 13360                                                          Page   1
                                Detail Report
SITE LOCATION
       Site ID:       3761                              Latitude:  50d 19m 14.7s
 Victoria File:                                        Longitude: 122d 48m 27.3s
 Regional File: 26250-20/3761
        Region: SURREY, LOWER MAINLAND

 Site Address: 7410 AND 7414 PROSPECT STREET
         City: PEMBERTON                       Prov/State: BC
  Postal Code:

 Registered: MAY 30, 1998  Updated: JUL 27, 2001  Detail Removed: JUL 25, 2001

 Notations:   5   Participants:   5    Associated Sites:   0
 Documents:   4 Susp. Land Use:   1 Parcel Descriptions:   0

Location Description: LOCATION DERIVED BY BC ENVIRONMENT REFERENCING RECTIFIED
 NAD 83 ORTHOPHOTOGRAPHY - MAR.24,1997

Record Status: NOT ASSIGNED
 Fee category: LARGE SITE, SIMPLE CONTAMINATION

 = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = =
NOTATIONS

  Notation Type: CERTIFICATE OF COMPLIANCE REQUESTED WITHOUT INSPECTION
 Notation Class: WASTE MANAGEMENT ACT: CONTAMINATED SITES NOTATIONS
      Initiated: JUN 18, 1998                        Approved: NOV 16, 1998

 Ministry Contact: ALDRIDGE, JO-ANN

 Notation Participants                               Notation Roles
 ALDRIDGE, JO-ANN                                    REVIEWED BY
 BC BUILDINGS CORPORATION (BURNABY)                  REQUESTED BY
 LEVELTON ENGINEERING ASSOCIATES LTD (RICHMOND)      RECEIVED BY

 Note: CLOSURE REPORT DATED MAY 8, 1998 LISTED UNDER DOCUMENTS.  1998-11-16 -
 SITE IS NOT ELIGIBLE FOR A CERTIFICATE OF COMPLIANCE.  COVER LETTER AND
 TECHNICAL REVIEW SENT TO APPLICANT.
```

Required Actions: 1998-11-16 - RESUBMISSION OF REMEDIATION COMPLETION REPORT. ADDITIONAL CONFIRMATORY SAMPLING REQUIRED. ELEVATED IRON AND MANGANESE CONCENTRATIONS IN GROUNDWATER NEED TO BE ADDRESSED.

- -

Notation Type: OTHER WASTE SYSTEM NUMBERS
Notation Class: ADMINISTRATIVE
Initiated: NOV 07, 1997 Approved: NOV 07, 1997

Ministry Contact: POPE, DOUGLAS

Notation Participants	Notation Roles
LEVELTON ENGINEERING ASSOCIATES LTD (RICHMOND)	REQUESTED BY
BC BUILDINGS CORPORATION (BURNABY)	RECEIVED BY

NOTATIONS

POPE, DOUGLAS ISSUED BY

Note: DELISTING OF APPROXIMATELY 120 CUBIC METRES OF HYDROCARBON-CONTAMINATED SOILS (XYLENES)

- -

Notation Type: SITE INVESTIGATION REPORT SUBMITTED
Notation Class: ADMINISTRATIVE
Initiated: MAR 17, 1997 Approved: MAR 17, 1997

Ministry Contact: ALDRIDGE, JO-ANN

Notation Participants	Notation Roles
BH LEVELTON & ASSOCIATES LTD (RICHMOND)	SUBMITTED BY
ALDRIDGE, JO-ANN	REVIEWED BY
BC BUILDINGS CORPORATION (BURNABY)	REQUESTED BY

Note: AN EVALUATION OF HYDROCARBON CONTAMINATION AROUND FUEL STORAGE SHED AT THE PEMBERTON FOREST SERVICE OFFICE

- -

Notation Type: SITE INVESTIGATION REPORT SUBMITTED

Notation Class: ADMINISTRATIVE
Initiated: MAR 17, 1997 Approved: MAR 17, 1997

Ministry Contact: ALDRIDGE, JO-ANN

Notation Participants	Notation Roles
BH LEVELTON & ASSOCIATES LTD (RICHMOND)	SUBMITTED BY
ALDRIDGE, JO-ANN	REVIEWED BY
BC BUILDINGS CORPORATION (BURNABY)	REQUESTED BY

Note: GARIBALDI TIRE, 1380 ASTER STREET, PEMBERTON, B.C. - LIMITED PHASE II ENVIRONMENTAL SITE ASSESSMENT

- -

Notation Type: SITE INVESTIGATION REPORT SUBMITTED
Notation Class: ADMINISTRATIVE
Initiated: MAR 17, 1997 Approved: MAR 17, 1997

Ministry Contact: ALDRIDGE, JO-ANN

Notation Participants	Notation Roles
BH LEVELTON & ASSOCIATES LTD (RICHMOND)	SUBMITTED BY
ALDRIDGE, JO-ANN	REVIEWED BY
BC BUILDINGS CORPORATION (BURNABY)	REQUESTED BY

Note: PHASE 1 ENVIRONMENTAL SITE ASSESSMENT

= =

SITE PARTICIPANTS

Participant: ALDRIDGE, JO-ANN
Role(s): MAIN MINISTRY CONTACT
Start Date: MAR 17, 1997 End Date: OCT 27, 2001

SITE PARTICIPANTS

- -

Participant: BC BUILDINGS CORPORATION (BURNABY)

Role(s): PROPERTY OWNER
Start Date: JAN 29, 1993 End Date:

- -

Participant: BH LEVELTON & ASSOCIATES LTD (RICHMOND)
Role(s): ENVIRONMENTAL CONSULTANT/CONTRACTOR
Start Date: JAN 29, 1993 End Date:

- -

Participant: LEVELTON ENGINEERING ASSOCIATES LTD (RICHMOND)
Role(s): ENVIRONMENTAL CONSULTANT/CONTRACTOR
Start Date: NOV 07, 1997 End Date:

- -

Participant: POPE, DOUGLAS
Role(s): ALTERNATE MINISTRY CONTACT
Start Date: NOV 07, 1997 End Date: MAY 21, 2002

= =

DOCUMENTS

Title: ADDITIONAL ENVIRONMENTAL INVESTIGATION AND BIO-PILE DECOMMISSIONING
Authored: MAY 08, 1998 Submitted: JUN 18, 1998

Participants	Role
LEVELTON ENGINEERING ASSOCIATES LTD (RICHMOND)	AUTHOR
BC BUILDINGS CORPORATION (BURNABY)	COMMISSIONER

- -

Title: SITE REMEDIATION PLAN PEMBERTON FOREST SERVICE YARD
Authored: MAR 17, 1997 Submitted: MAR 17, 1997

Participants	Role
BH LEVELTON & ASSOCIATES LTD (RICHMOND)	AUTHOR
BC BUILDINGS CORPORATION (BURNABY)	COMMISSIONER
ALDRIDGE, JO-ANN	REVIEWER

- -

Title: PHASE 1 ENVIRONMENTAL SITE ASSESSMENT PEMBERTON FORESTRY SERVICES YARD
Authored: NOV 29, 1996 Submitted: MAR 17, 1997

Participants	Role
BH LEVELTON & ASSOCIATES LTD (RICHMOND)	AUTHOR
BC BUILDINGS CORPORATION (BURNABY)	COMMISSIONER
ALDRIDGE, JO-ANN	REVIEWER

- -

Title: AN EVALUATION OF HYDROCARBON CONTAMINATION AROUND FUEL STORAGE SHED AT THE PEMBERTON FOREST SERVICE OFFICE
Authored: JAN 29, 1993 Submitted: MAR 17, 1997

Participants	Role
BH LEVELTON & ASSOCIATES LTD (RICHMOND)	AUTHOR
BC BUILDINGS CORPORATION (BURNABY)	COMMISSIONER
ALDRIDGE, JO-ANN	REVIEWER

= =

SUSPECTED LAND USE

Description: PETRO. PROD., WHOLESALE BULK STORAGE OR DISTRIBUTION

SUSPECTED LAND USE

Notes:
No activities were reported for this site

End of Detail Report

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 As of: FEB 12, 2017       BC Online: Site Registry                    17-02-14
                     For: PF43481  KEYSTONE ENVIRONMENTAL LTD.         17:30:29
 Folio: 13360                                                          Page   1
                                Detail Report
SITE LOCATION
       Site ID:       4776                            Latitude:  50d 19m 28.7s
 Victoria File:                                      Longitude: 122d 48m 25.0s
 Regional File: 26250-20/4776
        Region: SURREY, LOWER MAINLAND

 Site Address: 7432 PROSPECT STREET
         City: PEMBERTON                       Prov/State: BC
  Postal Code:

 Registered: OCT 15, 1998  Updated: OCT 17, 2003  Detail Removed: OCT 17, 2003

 Notations:   1   Participants:   4    Associated Sites:   0
 Documents:   1 Susp. Land Use:   0 Parcel Descriptions:   0

Location Description: PEMBERTON

Record Status: NOT ASSIGNED
 Fee category: UNRANKED

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NOTATIONS

  Notation Type: NOTICE OF INDEPENDENT REMEDIATION INITIATION SUBMITTED (WMA
                 28(2))
 Notation Class: WASTE MANAGEMENT ACT: CONTAMINATED SITES NOTATIONS
      Initiated: AUG 20, 1997                        Approved: AUG 20, 1997

 Ministry Contact: POPE, DOUGLAS

 Notation Participants                               Notation Roles
 SOILCON LABORATORIES LTD (OLAFSON AVENUE,           SUBMITTED BY
 RICHMOND)

 Required Actions: NOTIFIED TONY WONGHEN OF THE REQUIREMENT FOR APPROVAL OF
 ANY SPECIAL WASTE SOILS ON-SITE
 = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = =
SITE PARTICIPANTS
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  Participant: MCCAMMON, ALAN (SURREY) W
      Role(s): MAIN MINISTRY CONTACT
   Start Date: MAY 22, 2002                           End Date:
        Notes: DEFAULT AFTER DOUG POPE
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
  Participant: NIEMIEC, ROSE
      Role(s): PROPERTY OWNER
   Start Date: AUG 20, 1997                           End Date:
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
  Participant: POPE, DOUGLAS
      Role(s): MAIN MINISTRY CONTACT
   Start Date: AUG 20, 1997                           End Date: MAY 21, 2002
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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SITE PARTICIPANTS

  Participant: SOILCON LABORATORIES LTD (OLAFSON AVENUE, RICHMOND)
      Role(s): ENVIRONMENTAL CONSULTANT/CONTRACTOR
   Start Date: AUG 18, 1997                           End Date:
 = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = =
DOCUMENTS

 Title: NOTIFICATION OF INDEPENDENT REMEDIATION
             Authored: AUG 18, 1997              Submitted: AUG 20, 1997
 Participants                                      Role
 SOILCON LABORATORIES LTD (OLAFSON AVENUE,         AUTHOR
 RICHMOND)
No activities were reported for this site

                              End of Detail Report
```

As Of: FEB 12, 2017 BC Online: Site Registry 17/02/14
For: PF43481 KEYSTONE ENVIRONMENTAL LTD. 12:36:48
Folio: 13360 Page 1

5 records selected for 0.5 km from latitude 50 deg, 19 min, 18.4 sec
and Longitude 122 deg, 48 min, 33.2 sec

Site Id	Lastupd	Address / City
0003761	01JUL27	7410 AND 7414 PROSPECT STREET PEMBERTON
0004776	03OCT17	7432 PROSPECT STREET PEMBERTON
0007890		7423 FRONTIER STREET PEMBERTON
0009442	10MAY20	1398 PORTAGE ROAD PEMBERTON
0012286	17FEB08	1398 PORTAGE ROAD PEMBERTON

APPENDIX D

GENERAL TERMS AND CONDITIONS FOR SERVICES

Keystone Environmental
Knowledge-Driven Results

KEYSTONE ENVIRONMENTAL LTD.
GENERAL TERMS AND CONDITIONS FOR SERVICES

The terms and conditions set forth below govern all work or services requested by CLIENT as described and set forth in the Proposal and/or Work Plan of Keystone Environmental Ltd. ("Keystone Environmental "), any Purchase Order issued by CLIENT or Agreement between Keystone Environmental and CLIENT. The provisions of said Proposal or Agreement govern the scope of services to be performed, including the time schedule, compensation, and any other special terms. The terms and conditions contained herein shall otherwise apply expressly stated to the contract including any terms in addition to or inconsistent with said Proposal or Agreement.

1. COMPENSATION

The fees for services provided by Keystone Environmental consists of: (1) an hourly billing rate for any staff member actively working on a project, except for lump-sum or percent of construction fee basis projects; (2) reimbursement of direct expenses; (3) reimbursement of subcontractor's and other special costs; and (4) use and rental charges for equipment. Invoices covering these charges and expenses will be submitted for payment on a monthly basis, unless other arrangements have been agreed upon in writing.

All time, including traveling hours, spent on the project by Keystone Environmental personnel will be invoiced. Overtime incurred by and paid to personnel may be invoiced at a rate of 1.2 times the hours worked, if so stipulated in the proposal and/or work plan. Unless a lump-sum bid is submitted or percent of construction fee basis used, any cost estimate presented in the proposal and/or work plan is for budgetary purposes only and is not a fixed lump-sum bid. If it becomes apparent that the budgetary estimate is not sufficient to complete the project in a satisfactory manner, the client will be advised before the budgetary estimate is exceeded.

REIMBURSABLE EXPENSES

(a) The following expenses will be invoiced at cost plus 10% to cover overhead:
   (i) Travel expenses including airfare, rental vehicles, personal vehicles at $0.54/km for less than 5,000 kms and $0.48/km for 5,000 kms and over, subsistence and lodging.
   (ii) Shipping/storage charges and costs for expendable sampling and field supplies.
   (iii) Communications costs, including telephone and mailing costs including courier services.
   (iv) All project-related purchases including subcontractor costs, laboratory charges, material fees, duties, deposits, equipment purchases, third party equipment rentals and other outside costs incurred specifically for the project.

(b) The following expenses will be invoiced at the rates which follow:
   (i) Field and reproduction equipment in accordance with our Equipment Rate Schedule.
   (ii) Photocopying at $ 0.15 per copy.
   (iii) Engineering and specialty software services will be invoiced at $20.00/connect hour as stipulated in the proposal and/or work plan

GST/HST paid on expenses and disbursements by Keystone Environmental is not included in invoiced costs. GST/HST will be added to all invoices other than invoices sent to GST/HST exempt Clients

Payment shall be provided by money transfer, cheque, or, if with prior approval by Keystone Environmental, Master Card or Visa. A surcharge of 3% may be added to payments by MasterCard or Visa if the payment amount exceeds $6,000.00. Fees shall be paid in advance if stipulated in the proposal and/or work plan. Where payment in advance is not stipulated in the proposal and/or work plan, progress invoices will be issued monthly and are to be paid within 30 days of the invoice date. Subcontractor billings are payable upon presentation. A finance charge of 1.5% per month (19.6% per annum) may be charged on past due accounts. Payment of Keystone Environmental invoices shall be in Canadian currency.

CLIENT agrees to compensate Keystone Environmental in accordance with the total fee as stipulated in Keystone Environmental's proposal and/or work plan.

Keystone Environmental may, at its sole discretion, withhold work products at any time that accounts are past due and until accounts are paid in full. Keystone Environmental may also, at its sole discretion, stop work at any time accounts are past due.

In the event that Keystone Environmental shall take collection or legal action for the recovery of the payment of outstanding accounts, Keystone Environmental shall be entitled to recover all collection and legal fees and expenses incurred by it with respect to such action.

2. INDEPENDENT CONTRACTOR

Keystone Environmental shall be an independent contractor and shall be fully independent in performing the services of work and shall not act or hold themselves out as an agent, servant or employee of CLIENT.

3. KEYSTONE ENVIRONMENTAL'S LIMITED WARRANTY

The sole and exclusive warranty which Keystone Environmental makes with respect to the services to be provided in the performance of the work is that they shall be performed in accordance with generally accepted professional practices.

In the event Keystone Environmental's performance of work, or any portion thereof, fails to conform to the above stated limited warranty, Keystone Environmental shall, at its discretion and its expense, proceed expeditiously to repertory the nonconforming, or upon the mutual agreement of the parties, refund the amount of compensation paid to Keystone Environmental for such nonconforming work. In no event shall Keystone Environmental be required to bear the cost of gaining access in order to perform its warranty obligations.

4. CLIENT WARRANTY

CLIENT warrants that: it will provide to Keystone Environmental all available information regarding the site, including underground structures and utilities, facilities, buildings, and land involved with the work and that such information shall be true and correct and that it has title to or will provide right of entry or access to all property necessary to perform the work. The Client shall provide all licenses and permits required for the work, unless otherwise stated in the proposal and/or work plan,

5. INDEMNITY

a. Subject to the limitations of Section 7 below, Keystone Environmental agrees to indemnify, defend and hold harmless CLIENT (including its officers, directors, employees and agents) from and against any and all losses, damages, liabilities, and the costs and expenses incident thereto (including reasonable legal fees and reasonable costs of investigation) which any or all of them may hereafter incur, become responsible for or pay out as a result of death or bodily injuries to any person, destruction or damage to any property, private or public, contamination or adverse effects on the environment or any violation or alleged violation of governmental laws, regulations, or orders, to the extent caused by or arising out of: (i) Keystone Environmental's errors or omissions or (ii) negligence on the part of Keystone Environmental in performing services hereunder.

b. CLIENT agrees to indemnify and hold harmless Keystone Environmental (including its officers, directors, employees and agents) from and against any and all losses, damages, liabilities, and the costs and expenses incident thereto (including legal fees and reasonable costs of investigation) which any or all of them may hereafter incur, become responsible for or pay out as a result of death or bodily injuries to any person, destruction or damage to any property, private or public, contamination or adverse effects on the environment or any violation or alleged violation of governmental laws, regulations, or orders, caused by, or arising out of in whole or in part: (i) any negligence or willful misconduct of CLIENT, (ii) any breach of CLIENT of any warranties or other provisions hereunder, (iii) any condition including, but not limited to, contamination existing at the site, or (iv) contamination of other property arising or alleged to arise from or be related to the site provided, however, that such indemnification shall not apply to the extent any losses, damages, liabilities or expenses result from or arise out of: (i) any negligence or willful misconduct of Keystone Environmental; or(ii) any breach of Keystone Environmental of any warranties hereunder.

6. LIMITATION OF LIABILITY

Keystone Environmental's total liability, whether arising from or based upon breach of warranty, breach of contract, tort, including Keystone Environmental's negligence, strict liability, indemnity or any other cause of basis whatsoever, is expressly limited to the limits of Keystone Environmental's insurance coverage. This provision limiting Keystone Environmental's liability shall survive the termination, cancellation or expiration of any contract resulting from this Proposal and the completion of services thereunder. After three (3) years of completion of Keystone Environmental's services, any legal costs arising to defend third party claims made against Keystone Environmental in connection with the project defined in the Proposal or Agreement will be paid in full by the CLIENT.

7. INSURANCE

Keystone Environmental, during performance of this Agreement, will at its own expense carry Worker's Compensation Insurance within limits required by law; Comprehensive General Liability Insurance for bodily injury and for property damage; Professional Liability Insurance for errors omissions and negligence; and Comprehensive Automobile Liability Insurance for bodily injury and property damage. At CLIENT'S request, Keystone Environmental shall provide a Certificate of Insurance demonstrating Keystone Environmental's compliance with this section. Such Certificate of Insurance shall provide that said insurance shall not be cancelled or materially altered until at least ten (10) days after written notice to CLIENT.

8. CONFIDENTIALITY

Each party shall retain as confidential all information and data furnished to it by the other party which relate to the other party's technologies, formulae, procedures, processes, methods, trade secrets, ideas, improvements, inventions and/or computer programs, which are designated in writing by such other party as confidential at the time of transmission and are obtained or acquired by the receiving party in connection with work or services performed subject to this Proposal or Agreement, and shall not disclose such information to any third party.

However, nothing herein is meant to prevent nor shall it be interpreted as preventing either Keystone Environmental or CLIENT from disclosing and/or using said information or data; (i) when the information or data is actually known to the receiving party before being obtained or derived from the transmitting party; or (ii) when the information or data is generally available to the public without the receiving party's fault; or (iii) where the information or data is obtained or acquired in good faith at any time by the receiving party from a third party who has the right to disclose such information or data; or (iv) where a written release is obtained by the receiving party from the transmitting party; or (v) as required by law.

9. PROTECTION OF INFORMATION

Keystone Environmental specifically disclaims any warranties expressed or implied and does not make any representations regarding whether any information associated with conducting the work, including the report, can be protected from disclosure in responses to a request by a federal, provincial or local government agency, or in response to discovery or other legal process during the course of any litigation involving Keystone Environmental or CLIENT. Should Keystone Environmental receive such request from a third party, it will immediately advise CLIENT.

10. FORCE MAJEURE

Neither party shall be responsible or liable to the other for default or delay in the performance of any of its obligations hereunder (other than the payment of money for services already rendered) caused in whole or in part by strikes or other labour difficulties or disputes; governmental orders or regulations; war, riot, fire, explosion; acts of God; acts of omissions of the other party; any other like causes; or any other unlike causes which are beyond the reasonable control of the respective party.

In the event of delay in performance due to any such cause, the time for completion will be extended by a period of time reasonably necessary to overcome the effect of the delay. The party so prevented from complying shall within a reasonable time of its knowledge of the disability advise the other party of the effective cause, the performance suspended or affected and the anticipated length of time during which performance will be prevented or delayed and shall make all reasonable efforts to remove such disability as soon as possible, except for labour disputes, which shall be solely within said party's discretion. The party prevented from complying shall advise the other party when the cause of the delay or default has ended, the number of days which will be reasonably required to compensate for the period of suspension and the date when performance will be resumed. Any additional costs or expense accruing or arising from the delaying event shall be solely for the account of the CLIENT.

11. NOTICE

Any notice, communication, or statement required or permitted to be given hereunder shall be in writing and deemed to have been sufficiently given when delivered in person or sent by facsimile, wire, or certified mail, return receipt requested, postage prepaid, to the address of the party set forth below, or to such address for either party as the party may be written notice designate.

12. ASSIGNMENT/SUBCONTRACT

Neither party hereto shall assign this Agreement or any part thereof nor any interest therein without the prior written approval of the other party hereto except as herein otherwise provided. Keystone Environmental shall not subcontract the performance of any work hereunder without the written approval of CLIENT. Subject to the foregoing limitation, the Agreement shall inure to the benefit of and be binding upon the successors and permitted assigns of the parties hereto.

13. ESTIMATES

To the extent the work requires Keystone Environmental to prepare opinions of probable cost, for example, opinions of probable cost for the cost of construction, such opinions shall be prepared in accordance with generally accepted engineering practice and procedure. However, Keystone Environmental has no control over construction costs, competitive bidding and market conditions, costs of financing, acquisition of land or rights-of-way and Keystone Environmental does not guarantee the accuracy of such opinion of probable cost as compared to actual costs or contractor's bid.

14. DELAYED AGREEMENTS AND OBLIGATIONS

The performance by Keystone Environmental of its obligations under this Agreement depends upon the CLIENT performing its obligations in a timely manner and cooperating with Keystone Environmental to the extent reasonably required for completion of the Work. Delays by CLIENT in providing information or approvals or performing its obligations set forth in this Agreement may result in an appropriate adjustment of contract price and schedule.

15. CONSTRUCTION PHASE

To the extent the work is related to or shall be followed by construction work not performed by Keystone Environmental, Keystone Environmental shall not be responsible during the construction phase for the construction means, methods, techniques, sequences or procedures of construction contractors, or the safety precautions and programs incident thereto, and shall not be responsible for the construction contractor's failure to perform the work in accordance with the contract documents. Keystone Environmental will not direct, supervise or control the work of the CLIENT'S contractors or the CLIENT'S subcontractors.

16. DOCUMENTATION, RECORDS, AUDIT

Keystone Environmental when requested by CLIENT, shall provide CLIENT with copies of all documents relating to the service(s) of work performed. Keystone Environmental shall retain true and correct records in connection with each service and/or work performed and all transactions related thereto and shall retain all such records for twelve (12) months after the end of the calendar year in which the last service pursuant to this Agreement was performed. CLIENT, at its expense and upon reasonable notice, may from time to time during the term of this Agreement, and at any time after the date the service(s) were performed up to twelve (12) months after the end of the calendar year in which the last service(s) were performed, audit all records of Keystone Environmental in connection with all costs and expenses which it was invoiced.

17. REPORTS, DOCUMENTS AND INFORMATION

All field data, field notes, laboratory test data, calculations, estimates and other documents prepared by Keystone Environmental in performance of the work shall remain the property of Keystone Environmental. If required as part of the work, Keystone Environmental shall prepare a written report addressing the items in the work plan including the test results. Such report shall be the property of CLIENT, Keystone Environmental shall be entitled to retain one hard copy and electronic copy of such report for its internal use and reference.

Reports will be delivered to the client in electronic (PDF) format.

All drawings and documents produced under the terms of this Agreement are the property of Keystone Environmental, and cannot be used for any reason other than to bid and construct the project as described in the Proposal or Agreement.

18. LIMITED USE OF REPORT

Any report prepared as part of the work will be prepared solely for the internal use of CLIENT. Unless otherwise agreed by Keystone Environmental and CLIENT, parties agree that third parties are not to rely upon the report.

19. SAMPLE MANAGEMENT

Ownership of all samples obtained by Keystone Environmental from the project site is maintained by the CLIENT. Keystone Environmental or its laboratory sub-contractor will store such samples in a professional manner in a secure area for the period of time necessary to complete the project. Upon completion of the project, Keystone Environmental disposes of the samples in a lawful manner.

20. ACKNOWLEDGMENT AND RECOGNITION OF RISK

CLIENT recognizes and accepts the work to be undertaken by Keystone Environmental may involve unknown undersurface conditions and hazards. CLIENT further recognizes that environmental, geologic, hydrological, and geotechnical conditions can and may vary from those encountered by Keystone Environmental at the times and locations where it obtained data and information and that limitations on available data may result in some uncertainty with respect to the interpretation of these conditions. CLIENT recognizes that the performance of services hereunder or the implementation of recommendations made by Keystone Environmental in completing the work required may alter the existing site conditions and affect the environment in the site area.

Unknown undersurface conditions, including underground utility services, tanks, pipes, cables and other works (Underground Works) may be present at the site. Keystone Environmental will conduct utility locates to obtain available information regarding the location of Underground Works in accordance with industry practice. Utility locates are not a guarantee of the location of, or existence of, Underground Works and as a result damage to Underground Works may occur. Keystone Environmental relies on utility locates and Client provided “as-built” and record drawings to determine the location and existence of Underground

Works. CLIENT recognizes that the use of utility locates is not a guarantee or warranty that Underground Works may not be damaged and acknowledges that Keystone Environmental is not responsible for any damage caused to Underground Works or the repair of such damage or any resulting or related damage and any costs related to such damage.

21. DISPOSAL OF CONTAMINATED MATERIAL

It is understood and agreed that Keystone Environmental is not, and has no responsibility as, a generator, operator or storer of pre-existing hazardous substances or wastes found or identified at work sites. Keystone Environmental shall not directly or indirectly assume title to such hazardous or toxic substances and shall not be liable to third parties.

CLIENT will indemnify and hold harmless Keystone Environmental from and against all incurred losses, damages, costs and expenses, including but not limited to attorneys' fees, arising or resulting from actions brought by third parties alleging or identifying Keystone Environmental as a generator, operator, storer or owner of pre-existing hazardous substances or wastes found or identified at work sites.

22. SUSPENSION OR TERMINATION

In the event the work is terminated or suspended by CLIENT prior to the completion of the services contemplated hereunder, Keystone Environmental shall be paid for: (i) the services rendered to the date of termination or suspension, (ii) the demobilization costs, and (iii) the costs incurred with respect to non-cancelable commitments.

23. GOVERNING LAW

This Agreement shall be governed by and interpreted pursuant to the laws of the Province of British Columbia.

24. HEADINGS AND SEVERABILITY

Any heading proceeding the text of sections hereof is inserted solely for convenience or reference and shall not constitute a part of the Agreement and shall not affect the meanings, context, effect or construction of the Agreement. Every part, term or provision of this Agreement is severable from others. Notwithstanding any possible future finding by duly constituted authority that a particular part, term or provision is invalid, void or unenforceable, this Agreement has been made with the clear intention that the validity and enforceability of the remaining parts, terms and provision shall not be affected thereby.

25. ENTIRE AGREEMENT

The terms and conditions set forth herein constitute the entire Agreement and understanding or the parties relating to the provision of work or services by Keystone Environmental to CLIENT, and merges and supersedes all prior agreements, commitments, representation, writings, and discussions between them and shall be incorporated in all work orders, purchase orders and authorization unless otherwise so stated therein. The terms and conditions may be amended only by written instrument signed by both parties.

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TITLE SEARCH

TITLE SEARCH PRINT 2016-11-01, 09:14:23

File Reference: YP-00280.C.0102 Requestor: Diane Lee

Declared Value $N/A

CURRENT INFORMATION ONLY - NO CANCELLED INFORMATION SHOWN

Title Issued Under	SECTION 172 LAND TITLE ACT
Land Title District	KAMLOOPS
Land Title Office	KAMLOOPS
Title Number	V52157
From Title Number	S17188
Application Received	1983-08-02
Application Entered	1986-04-11
Registered Owner in Fee Simple	
Registered Owner/Mailing Address:	BRITISH COLUMBIA HYDRO AND POWER AUTHORITY 6TH FLOOR, 1045 HOWE STREET VANCOUVER, BC V6Z 2B1
Taxation Authority	NORTH SHORE - SQUAMISH VALLEY ASSESSMENT AREA VILLAGE OF PEMBERTON

Description of Land

Parcel Identifier: 003-621-791

Legal Description:

LOT 5 DISTRICT LOT 203 LILLOOET DISTRICT PLAN 31658

Legal Notations	NONE
Charges, Liens and Interests	NONE
Duplicate Indefeasible Title	NONE OUTSTANDING
Transfers	NONE
Pending Applications	NONE

PARCEL IDENTIFIER (PID): 003-621-791

SHORT LEGAL DESCRIPTION:S/31658/////5
MARG:
TAXATION AUTHORITY:
1 NORTH SHORE - SQUAMISH VALLEY ASSESSMENT AREA
2 VILLAGE OF PEMBERTON

FULL LEGAL DESCRIPTION: CURRENT
LOT 5 DISTRICT LOT 203 LILLOOET DISTRICT PLAN 31658

MISCELLANEOUS NOTES:

ASSOCIATED PLAN NUMBERS:
SUBDIVISION PLAN KAP31658

AFB/IFB: MN: N PE: 0 SL: 1 TI: 1

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OWNER’S AGENT AUTHORIZATION

From: Rodrigues, Sean
To: Lisa Pedrini; Tim Harris (tharris@pemberton.ca)
Cc: Mate, David
Subject: BC Hydro Pemberton Field Building Rezoning - Owner"s Agent
Date: Friday, February 17, 2017 1:47:24 PM

Good afternoon Tim & Lisa, I hope this finds you well.

Please accept this as confirmation that BC Hydro is assigning David Maté, working for WSP Canada Inc. located at suite 100 - 20339 – 96th Avenue in Langley, as our Owner's Agent for the rezoning and development permit applications for our property located at 1363 Aster Street, Pemberton.

I trust this satisfies your requirements. If you have any questions or issues, please do not hesitate to give me a call.
We look forward to working with you and the community to bring about a successful application.

Respectfully yours,
Sean.

Sean F. Rodrigues, Architect AIBC MRAIC | Project Manager, Properties

BC Hydro
333 Dunsmuir St, 13th floor
Vancouver, BC V6B 5R3

P 604 699 9004
M 604 219 0802
E Sean.Rodrigues@bchydro.com

bchydro.com
Smart about power in all we do.

Appendix 3

VILLAGE OF PEMBERTON

BYLAW No. XXX, 2017

Being a bylaw to amend the Village of Pemberton Zoning Bylaw No. 466, 2001

WHEREAS pursuant to Section 137 of the *Community Charter* a Council may amend its Zoning Bylaw from time to time;

AND WHEREAS the Council of the Village of Pemberton deems it desirable to permit a utility use in the Town Centre Commercial Zone (C-1) on a site specific basis on Lot 5, Plan 31658, D.L. 203, LLD to allow BC Hydro to upgrade their existing field office/works yard;

NOW THEREFORE the Council of the Village of Pemberton in open meeting assembled **ENACTS AS FOLLOWS**:

1. CITATION

This Bylaw may be cited as "Village of Pemberton Zoning (BC Hydro Redevelopment) Amendment Bylaw No. XXX, 2017"

2. Village Zoning Bylaw No. 466, 2001 be amended as follows:

a) Section 104.Definitions:

i. by adding the following:

a. **utility use:** means the use of land for the establishment of utility facilities and associated appurtenances for the provision of water, sewer, electrical, natural gas, communication, fire protection and transportation; where such use is established by a local, provincial or federal government, a Crown corporation or by a company or person regulated by a government agency or commission; or the use of land for such facilities where they are regulated by a government act or regulation.

b) Section 306.1 Town Centre Commercial (C-1) Permitted Land Uses:

i. by adding 'Utility Use **(g)**' to the list of Permitted Land Uses.

ii. By adding '(g) This use shall only be permitted on Lot 5, Plan 31658, D.L. 203, LLD, and is not permitted on any other lands in this zone.' to the list of provisos under Permitted Land Uses.

READ A FIRST TIME this ___ day of _____, 2017.

READ A SECOND TIME this ___ day of _____, 2017.

NOTICE OF PUBLIC HEARING for **Village of Pemberton Zoning (BC Hydro Redevelopment) Amendment Bylaw No. XXX, 2017 PUBLISHED IN THE** _____ on this ___ day of _____ 2017 and **PUBLISHED IN THE** _____ on this ___ day of _____ 2017.

PUBLIC HEARING HELD this ____ day of _____, 2017.

READ A THIRD TIME this ____ day of _____, 2017.

ADOPTED this _____day of _____, 2017.

_____	_____
Mayor	Corporate Officer
Mike Richman	Sheena Fraser

"INSERT MAP"