CORPORATION OF THE CITY OF VERNON

ADVISORY PLANNING COMMITTEE

MARCH 26, 2024, AT 4:00 PM

OKANAGAN LAKE ROOM (COUNCIL CHAMBER)

A G E N D A

1) CALL TO ORDER

2) LAND ACKNOWLEDGEMENT

As chair of the City of Vernon's Advisory Planning Committee (APC), and in the spirit of this gathering, I recognize the City of Vernon is located in the traditional territory of the Syilx people of the Okanagan nation.

3) ADOPTION OF AGENDA

4) ADOPTION OF MINUTES

a) March 12, 2024 (Attached)

5) NEW BUSINESS

a) OCP00088 (7025 Herbert Road) / ZON00369 (7110 Bates Road)

6) INFORMATION ITEMS

a) Staff Liaison to provide verbal update of APC related items discussed at the last Council meeting.

7) NEXT MEETING

The next meeting is tentatively scheduled for **April 9, 2024**.

8) ADJOURNMENT

THE CORPORATION OF THE CITY OF VERNON

MINUTES OF THE
ADVISORY PLANNING COMMITTEE MEETING
HELD MARCH 12, 2024 AT 4:00 PM
OKANAGAN LAKE ROOM (COUNCIL CHAMBERS)

PRESENT: Mayor Cumming
Scott Chatterton
Kyla Gaudreau
Craig Neville
Jordan Hart
Margo Jarman
Claire Ishoy, *Acting Chair*
Kennedy Mund

ABSENT: Jessica Kirkland
Margo Lupien
Monique Hubbs-Michiel

STAFF: Michelle Austin, Current Planner
Jennifer Pounder, Records/Committee Clerk

ORDER

The meeting was called to order at 4:03 p.m.

LAND ACKNOWLEDGEMENT

As Chair of the City of Vernon's Advisory Planning Committee, and in the spirit of this gathering, I recognize the City of Vernon is located in the traditional territory of the Syilx people of the Okanagan nation.

ADOPTION OF THE AGENDA

Moved by M. Jarman, seconded by C. Neville:

THAT the agenda of the March 12, 2024 Advisory Planning Committee meeting be adopted.

CARRIED

ADOPTION OF THE MINUTES

Moved by C. Ishoy, seconded by J. Hart:

THAT the minutes of the January 23, 2024 Advisory Planning Committee meeting be adopted.

CARRIED

NEW BUSINESS:

ANNUAL ORIENTATION

M. Austin provided the Committee with their annual orientation which included the following:

- Purpose of the Committee
- Membership and terms
- Agenda preparation
- Meeting schedule
- Role of the Chair and Vice Chair

ELECTION OF CHAIR AND VICE CHAIR

Chair

There was a call for nominations. M. Hubbs-Michiel self nominated via absentee ballot. No other nominations were put forward. M. Hubbs-Michiel is appointed Chair for 2024.

Vice Chair

There was a call for nominations. C. Ishoy self nominated for Vice Chair. No other nominations were put forward. C. Ishoy is appointed Vice Chair for 2024

DVP00623 (3106 16 AVENUE)

M. Austin, Current Planner, provided an overview of the application as follows:

- The property was previously developed with semi-detached housing that was demolished in October, 2023 in preparation for redevelopment.
- The owner plans to redevelop the property with a three-storey four-plex. In order to do this, they are requesting the following variances:

    1. Decrease the minimum side yard (east) from 4.5m to 1.7m;
    2. Not be required to fence along the side yard paralleling 31A Street and along the rear yard paralleling 15 Avenue; and
    3. Decrease the minimum number of residential parking spaces from eight(8) to six(6).

The following questions/comments were received:

- Clarification regarding the fence requirement was requested.
    - Staff explained that the City's landscaping and screening regulations are undergoing revisions as they are dated and inflexible.
    - Rationale for supporting the application relates to sightlines and eyes on the street.

- Concerns were expressed regarding parking and the amount of hospital-related on street parking occurring on streets in the area.
    - Staff noted that there is on-street parking available on the south side of 15th Avenue, adjacent to the subject property.
- It was suggested to plant shade trees on the west side of the property in response to climate change.
    - Staff noted that this would be implemented through the development permit process.

MOVED by C. Neville, seconded by S. Chatterton:

THAT the Advisory Planning Committee recommends Council support Development Variance Permit Application 00623 (DVP00623) to vary Zoning Bylaw 5000 for Lot 3, Sec. 34, Twp. 9, ODYD, Plan 7135 (3106 16th Avenue) for construction of a four-plex development as outlined in the report titled "Development Variance Permit Application for 3106 16th Avenue" dated March 6, 2024 and respectfully submitted by the Planner, as follows:

a) Section 9.12.5(b), minimum side yard (east) from 4.5m to 1.7m;

b) Table 6.1, Minimum Landscape Buffer Schedule, RH1 Zone Level 2 Landscape Buffer for the west side yard and rear yard from "a minimum 1.5m vegetative landscape buffer combined with a fence" to "a minimum 1.5m vegetative landscape buffer"; and

c) Table 7.1 - Parking Schedule from eight (8) to six (6) parking spaces for a four-plex with three or more bedrooms in each unit;

AND FURTHER, that Council's support of DVP00623 is subject to the following:

a) That the development generally complies with the Site Plan & Zoning, prepared by CM Designs, dated August 14, 2023 (Attachment 3) to be attached to and form part of DVP00623;

b) That the maximum building height does not exceed 11.4m; and

c) That the gravel spaces fronting 15th Avenue shown on the Site Plan & Zoning, prepared by CM Designs, dated August 14, 2023 (Attachment 3) be vegetated to discourage parking.

CARRIED

INFORMATION ITEMS:

M. Austin provided an update of recent Council decisions on bylaws and applications previously considered by the Advisory Planning Committee.

NEXT MEETING

The next meeting for the Advisory Planning Committee is set for March 26, 2024 at 4:00 p.m.

ADJOURNMENT

The meeting of the Advisory Planning Committee adjourned at 4:45 p.m. by call of the Chair.

CERTIFIED CORRECT:

_____ Chair

THE CORPORATION OF THE CITY OF VERNON
REPORT TO COUNCIL

SUBMITTED BY: Lydia Korolchuk
Current Planner, Planning

COUNCIL MEETING: REG ☒ COW ☐ I/C ☐
COUNCIL MEETING DATE: April 8, 2024
REPORT DATE: March 12, 2024
FILE: 3340-20 (OCP00088) 3360-20 (ZON00369)

SUBJECT: **OFFICIAL COMMUNITY PLAN AND ZONING AMENDMENT APPLICATIONS FOR 7025 HERBERT ROAD / 7110 BATES ROAD**

PURPOSE:

To review the Official Community Plan (OCP) and zoning amendment applications subsequent to the OCP open house for the property located at 7025 Herbert Road / 7110 Bates Road, which propose changes to the future land use and zoning of the subject property in order to facilitate a new residential housing development.

RECOMMENDATION:

THAT Council support Official Community Plan Amendment Application 00088 (OCP00088) to amend the Future Land Use designation from CR NORD – Country Residential to RLD – Residential Low Density for Lot 3, Section 18, Township 5, ODYD, Plan 29910 (7025 Herbert Road / 7110 Bates Road) as outlined in the report titled "Official Community Plan and Zoning Amendment Applications for 7025 Herbert Road / 7110 Bates Road" dated March 12, 2024 and respectfully submitted by the Planner;

AND FURTHER, that Council support Zoning Amendment Application 00369 (ZON00369) to rezone from CR NORD – Country Residential to R5 – Four-plex Housing Residential for Lot 3, Section 18, ODYD, Plan 29910 (7025 Herbert Road / 7110 Bates Road) as outlined in the report titled "Official Community Plan and Zoning Amendment Applications for 7025 Herbert Road / 7110 Bates Road" dated March 12, 2024 and respectfully submitted by the Planner;

AND FURTHER, that final adoption of the OCP and zoning amendment bylaws be considered subsequent to the outstanding conditions of approval as set out in Attachment 8 in the report titled "Official Community Plan and Zoning Amendment Applications for 7025 Herbert Road / 7110 Bates Road";

AND FURTHER, that prior to final adoption of the OCP and zoning amendment bylaws, the Development Permit be ready for issuance.

ALTERNATIVES & IMPLICATIONS:

THAT, Council not support Official Community Plan Amendment Application 00088 (OCP00088) to amend the Future Land Use designation from CR NORD – Country Residential to RLD – Residential Low Density and Zoning Amendment Application 00369 (ZON00369) to rezone from CR NORD – Country Residential to R5 – Four-plex Housing Residential for Lot 3, Section 18, ODYD, Plan 29910 (7025 Herbert Road / 7110 Bates Road).

Note: This alternative does not support the OCP and rezoning amendment applications and prevents the alignment of designations from NORD to City of Vernon designations. The prevailing land use designation and zoning of the subject property would remain unchanged and the applications would be closed.

ANALYSIS:

A. Committee Recommendations

At its meeting of March 26, 2024, the Advisory Planning Committee passed the following resolution:

"(That the Advisory Planning Committee recommends that Council…)."

B. Rationale:

1. Public Information Session

In accordance with OCP Amendment Applications Policy – Section 4, a public open house was hosted by the City of Vernon to provide community residents with an additional opportunity to consider the OCP amendment application prior to the proposed bylaw amendment being considered by Council for First Reading.

The public open house was advertised in the local newspaper (the Morning Star) on two dates (Thursday October 5 and October 12, 2023). The open house was held in-person and on-line at Council Chambers, City Hall on Tuesday, October 17, 2023. Written submissions were accepted from September 26 until October 17, 2023.

The Info Session was well attended with approximately 50 people in attendance. Twelve pieces of written correspondence were also submitted to staff (Attachments 1).

Concerns were raised relating to:

- Increased traffic and noise for Manning Place and Herbert Road
- Rezoning for high density housing
- City's commitment to reduce GHG emissions
- Forest fire risk
- Construction noise and disruption to existing area residents
- Lack of transit/ area services
- Narrow roads in relation to garbage collection, snow removal and on-street parking

The applicant was in attendance and is aware of the comments raised and was encouraged to follow up with respondents.

2. Project Overview

This application proposes to build 57 stratified residential units in the form of semi-detached, tri-plex, and four-plex buildings (Attachment 2). The development would be served by an internal strata road with access/egress from Bates Road on the north side, and a second access/egress via Herbert Road to the south. A pedestrian connection is proposed along the western border of the property for public use.

The applicant is requesting to change the Future Land Use from the existing Regional District of North Okanagan (RDNO) designation to the City of Vernon OCP designation of RLD – Residential Low Density and to the R5 – Four-plex Housing Residential zone (Attachments 3 & 4). The property has a total area of 21,143.97 m^2 (2.01 hectares).

3. Background

The City of Vernon annexed the parcel from the RDNO on May 23, 2014. At that time, the 'CR NORTH – Country Residential' designation was retained. The site is directly adjacent to the Foothills Neighbourhood area on the south side of Silver Star Road (Figure 1). The Regional Growth Strategy (RGS) designates the Foothills Neighbourhood area as a 'growth area' and the annexation of the property makes the site eligible for connection to City services.

The parcel currently contains two dwellings and an outbuilding. It is within an area bounded to the south by a steep ravine area, above a belt of land within the Agricultural Land Reserve. With its frontage onto Silver Star Road, traffic created by the development would not be directed into existing agricultural areas, nor would it be expected to impact current and future farming activities.

With the property being adjacent to the Foothills Neighborhood Plan Area, along with the transportation network and the urgency of meeting the need for multi-family housing, Administration supports increased density on this parcel.

Figure 1 – Location of Subject Property

4. Neighbourhood Context

The Foothills Neighbourhood Plan area was endorsed by Council in October 2013. The subject property was not included in the Plan area as it was not annexed into the City of Vernon until the following year. The Foothills Neighbourhood Plan area is within Neighbourhood Plan Area 2 (NPA-2) and Development District #3 – Hillside Residential and Agricultural District as identified in the OCP. Because much of the land in the Foothills Neighbourhood Plan area is sloped and contains several highly sensitive ecosystems, both the Hillside Guidelines and the Environmental Management Areas Strategy apply and will play a large role in directing future development in this area.

5. OCP and Rezoning Amendment

The subject property is currently zoned CR NORD – Country Residential (RDNO). The applicant is seeking to rezone the parcel to R5 – Four-plex Residential Housing to allow for multi-family ground-oriented units. The building form allowed in the zone includes: single, semi-detached, tri-plex and four-plex housing on urban services and has a maximum density of 30 units/ha. This is consistent with the OCP designation of Residential Low Density (RLD) and with existing urban development in the surrounding area.

6. Environmental Management Considerations

The applicant submitted an Environmental Impact Assessment (EIA) report dated March 2023 (Attachment 5). The report concluded that nothing has been identified that would preclude development activities. Bounded on all sides by existing roads, the parcel has limited functionality as a wildlife corridor and is not anticipated to cause further landscape or habitat fragmentation.

The applicant's geotechnical report dated March 2, 2021 (Attachment 6) assessed the underlying soil and groundwater conditions on site and found them suitable for the support of future roadways, servicing infrastructure and typical residential foundations. The report recommends a follow-up geotechnical investigation at the Development Permit stage, as well as onsite stormwater, groundwater and snow storage management plans.

7. Engineering Development Services

As per Engineering Development Services requirements, the applicant submitted a Traffic Impact Assessment (TIA), dated March 21, 2023 (Attachment 7 & Attachment 8), to assess the impact of the proposed development on the intersection of Silver Star Road and Phoenix Drive/Bates Road. Silver Star Road is classified as an arterial road and is in the jurisdiction of the City. The City does not allow direct access onto an arterial road, in this case, Silver Star Road. Access to Bates Road and Herbert Road are within the RDNO boundary and are under the jurisdiction of the Ministry of Transportation and Infrastructure. This development is bounded by both roads and relies on them for primary access/egress. However, the development has been designed to limit access points to these rural residential roads and instead make use of an internal strata road. The new access on Herbert Road may feed traffic to the extension of Manning Place road.

Given that traffic volumes are in the order of 10,000 vehicles per day and the posted speed limit, the TIA recommends that a marked crosswalk with rectangular rapid flashing beacons should be installed at Silver Star Road. This crosswalk should be located on the south side of the intersection to tie-in to the Silver Star Road multi-use pathway. The developer may consider installing a sidewalk or path to connect the site to the crosswalk; while not required in the Transportation Master Plan, this would enhance the safety and liveability of the new development and encourage active transportation.

The development design proposes a pedestrian connection with the adjacent property to the south (Manning Place) that could support a portion of a future link to the BX Trail. Administration recommends that the development continue this connection to the intersection of Silver Star Road and Bates Road and coordinate shared implementation of the pedestrian pathway and intersection crosswalk improvements with the adjacent Manning Place development.

Any and all future development of the project site will be subject to the requirements of City of Vernon Subdivision and Development Servicing Bylaw 3843, Greater Vernon Water Subdivision and Development Servicing Bylaw 2650, and all other applicable City and RDNO bylaws. Requirements may include professional reports/studies, offsite infrastructure improvements, and road dedication, as appropriate. Should Council support the OCP and zoning amendment applications, Administration would recommend that the Development Permit and any variances (if required) be ready for issuance prior to final adoption of the bylaw amendments.

Administration supports the proposed OCP and zoning amendments for the following reasons:

a. The applicant has provided the City with appropriate studies and documentation to review the proposed development and ensure compliance with provincial legislation and requirements.

b. OCP amendments requested are in accordance with the guiding principles of the OCP and the RDNO's Regional Growth Strategy. The subject parcel is adjacent to a designated RDNO growth area and having been annexed to the City, is eligible for connection to City services. Thus, it currently meets the RGS definition of a growth area, that is, "*serviced by water and sewer infrastructure".*

c. The zoning amendments propose to change the existing RDNO rural zoning designation to a low-density multi-family residential zone ('R5 – Four-plex Housing Residential') that provides housing to the community where services and transportation infrastructure are available, in a form and design that is compatible with the transitional urban to rural character of the area.

d. Development of the subject property would allow for the creation of a substantial number of new dwellings (approximately 57 units) that would support a diverse mix of household types and income levels, while increasing active transportation, trail connections and infrastructure improvements at the intersections of Silver Star Road, Phoenix Drive and Bates Road.

C. Attachments:

Attachment 1 – Public Comments
Attachment 2 – Proposed Site Plan
Attachment 3 – OCP Map
Attachment 4 – Zoning Map
Attachment 5 – Environmental Assessment Report
Attachment 6 – Geotechnical Report
Attachment 7 – Engineering Development Servicing Report
Attachment 8 - Traffic Impact Assessment

D. Council's Strategic Plan Alignment

☐ Governance & Organizational Excellence	☒ Livability
☒ Recreation, Parks & Natural Areas	☐ Vibrancy
☐ Environmental Leadership	☐ Not Applicable

E. Relevant Policy/Bylaws/Resolutions:

1. Official Community Plan Bylaw 5470:
   - Current OCP Designation: CR NORD – Country Residential (RDNO)
   - Proposed OCP Designation: RLD – Residential Low Density
   - Development District #3 – Hillside Residential and Agricultural District

2. Zoning Bylaw 5000:
   - Current Zoning: CR NORD – Country Residential (RDNO)
   - Proposed Zoning: R5 – Four-plex Housing Residential

3. Foothills Neighbourhood Plan
   - Provide the Right Housing in the Right Place: Clusters of four-plexes and rowhouses near major roads provide housing variety while encouraging density along these routes, necessary for services like transit to be provided.

4. *Local Government Act*:
   - Division 3 – Public Hearings on Planning and Land Use Bylaws
   - Sec. 464 – Requirement for a public hearing before adopting a bylaw

BUDGET/RESOURCE IMPLICATIONS:

N/A

FINANCIAL IMPLICATIONS:

☒ None ☐ Budget Previously Approved ☐ New Budget Request (Finance Review Required)

Prepared by:

X _____
Lydia Korolchuk
Current Planner, Planning

X _____
Terry Barton, Director
Planning and Community Services

Approved for submission to Council:

X _____
Patricia Bridal, CAO

Date: _____

REVIEWED WITH

- ☐ Corporate Services
  - ☐ Bylaw Compliance
  - ☒ Real Estate
- ☐ RCMP
- ☐ Fire & Rescue Services
- ☐ Human Resources
- ☐ Financial Services
- ☒ COMMITTEE: APC (March 26/24)
- ☐ OTHER:
- ☐ Operations
  - ☐ Public Works/Airport
  - ☐ Facilities
  - ☐ Utilities
- ☐ Recreation Services
- ☒ Parks
- ☒ Current Planning (Approving Officer)
- ☒ Long Range Planning & Sustainability
- ☐ Building & Licensing
- ☒ Engineering Development Services
- ☐ Infrastructure Management
- ☒ Transportation
- ☐ Economic Development & Tourism

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Barbara Everdene

From: Cheri Faris [redacted]
Sent: Wednesday, October 4, 2023 7:26 AM
To: Planning
Subject: Bates/Manning Project

Categories: Megan

Smaller more affordable housing is a good thing. I support this project.

Cheri Faris
Foothills Resident

Barbara Everdene

From: Terry Barton
Sent: Tuesday, October 3, 2023 12:44 PM
To: Barbara Everdene
Subject: FW: Foothills Housing

Hi Barbara – correspondence from the public – see Patti's note.
Thanks, Terry

From: Patti Bridal <PBridal@vernon.ca>
Sent: Tuesday, October 3, 2023 11:28 AM
To: Terry Barton <TBarton@vernon.ca>; Sarah Smith <SSmith@vernon.ca>
Cc: Kevin Poole <KPoole@vernon.ca>
Subject: FW: Foothills Housing

Hi

Terry – this will need to be included in your public information submissions.

Sarah – please formally advise Mr. HAAS that his email has been received and forwarded to the Planning team to be included as a public submission to the open house Copy council on your acknowledgement.

thanks

Patti

Patricia Bridal *(she/her)*
Chief Administrative Officer
3400 30th Street, Vernon BC V1T 5E6
Office: 250.550-3515 Email: pbridal@vernon.ca I www.vernon.ca

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From: Garry n MaryAnne HAAS [redacted]
Sent: Monday, October 2, 2023 11:14 AM
To: Patti Bridal <PBridal@vernon.ca>; Mayor <Mayor@vernon.ca>
Cc: Akbal Mund <AMund@vernon.ca>; Brian Guy <BGuy@vernon.ca>; Brian Quiring <BQuiring@vernon.ca>; Kari Gares <KGares@vernon.ca>; Kelly Fehr <KFehr@vernon.ca>; Teresa Durning <TDurning@vernon.ca>
Subject: Foothills Housing

Use Caution - External Email

I am not adding this as a attachment as I suspect many do not read it

am writing this because it for two main reasons. First I believe this is wrong and many of my coffee friends also think this and wish me to write this. The second is that people in the foothills hills according to castanet (where this item was taken from) also disagree with you.

"A proposed project to build 57 strata units at the northeastern edge of Vernon is moving forward to a public open house."

The reason for the letter is simple I have tried the public meetings and open house idea meany times as find that they do not work. I have gone to five or six and have never had a question answered clearly, and written submissions well they do not get made public either online or are available at the meetings.

"The plan is to rezone a country residential property just outside the Silver Star foothills community to allow for 13 semi-detached buildings, one triplex, and seven quadruples."

No where do you indicate whether these are going to be low cost or a market value for sale or rent.

"It received glowing praise from councillors and passed unanimously to the next step in the process."

"This is a great project, exactly what we want," said Coun. Brian Quiring. "This is exactly what the community needs."

What criteria is Mr. Quiring using to make this statement

"He added the development would be close to schools and fire protection services."

On elementary school any others schools are fifteen minutes or better from this area. Is the fire department volunteer or full time. If volunteer what effect would it have on making it full time and at what cost

"Located at 7025 Herbert Rd. and 7110 Bates Rd., the two-hectare parcel is located on land annexed from the Regional District of the North Okanagan in 2014."

Lovely agricultural land

"It also borders Silver Star Road, but there would be no access points directly off it."

But if bu8ilt it will create a major traffic problem with all the cars and people turning.

"The project is in early stages, and now moves ahead to allow for public input as early as next month.

Coun. Kari Gares said she was "thrilled' to see the project come to council."

I too am excited to see a project like this come up but not with no information for the public to go to a p open house on

"She added it speaks to the housing needs of the community."

What the community requires is low cost and small houses and apartments to be built so the regular public can afford to have a dry and clean place to live

"Housing needs and affordability have been an ongoing issue in Vernon and across B.C. as rental vacancies continue to hover near zero."

This is true but you have to built smaller apartments with simpler apartments to keep all costs down and they must have a long term rent control on them so that in the future they turned into places for those with the money to stay or live.

Barbara Everdene

From: Jeanie Fraser [redacted]
Sent: Tuesday, October 17, 2023 6:35 PM
To: Planning
Subject: Concerns re OCP Amendment Application OCP00088

Hello,
I am writing this on behalf of my husband and myself. We just came from the Open House regarding the OCP00088 amendment application and we left feeling discouraged that our feedback, along with our neighbours's feedback, was not seriously considered, and so we are putting it in writing.

We recognize the need for additional housing in Vernon. Our concern is the safety and noise impact of increased traffic on the narrow local street of Manning Place with the addition of these 57 units. If it were guaranteed that none of these units would be using Manning Place to get to or from their home, and solely using Silver Star Rd. to access their homes, then we would not have issue with this application. We were told this development needs to have two exits in the event of emergency. The exit onto Herbert Rd is problematic as it will significantly increase traffic on Manning Place. A reasonable compromise could be gating that exit, with emergency staff having the ability to open the gate in the event of an emergency.

Manning Place currently is basically a single lane when cars are parked on the street, and very narrow, especially in the snowy season. Most units front the street so quality of life will be negatively impacted by dramatically increased traffic from an additional 57 units. With snow pile ups, visibility is reduced creating a problematic safety concern. Silver Star Rd has been designed to accommodate heavier levels of traffic, so traffic for this development needs to be routed via Silver Star Rd.

We hope staff and council will delay moving forward with this application until a viable solution is in place to ensure traffic moves solely via SilverStar Rd to access this development.

We trust you will take these concerns under serious consideration.

Jean Fraser and Daniel Jarvis

Barbara Everdene

From: Suz Singh [redacted]
Sent: Wednesday, October 11, 2023 10:46 PM
To: Planning
Subject: OCP Amendment #00088 / Rezoning #00369 (7025 Herbert Road / 7110 Bates Road)

Use Caution - External Email

Dear Mayor Cumming and Council Members,
I am writing to you regarding OCP Amendment #00088 / Rezoning #00369 (7025 Herbert Road / 7110 Bates Road). I have 2 major concerns with the rezoning of this property for high density housing. With the City's commitment to reduce emissions we should be focusing future high density homes in the downtown to reduce gas vehicle emissions from transportation needs. Expanding high density housing at a distance (especially uphill) from downtown means more burning of fossil fuels as inhabitants drive to and from their homes. Furthermore, this proposed build site is on the edge of a densely forested area. Given our now regular wildfires, doesn't that place the new homes, and the already existing homes at a greater risk to forest fires? Keeping some distance between the dense forest and the homes in the Foothills seems prudent. Building 4 plex on this land could create a bridge for a forest fire to the existing homes in the Foothills. I urge you for both of these reasons to consider denying the rezoning of this land.

Sincerely,
Suzanna Singh

Barbara Everdene

From: Todd Fitzpatrick [redacted]
Sent: Thursday, October 12, 2023 2:51 PM
To: Planning
Subject: Public Input Session - Questions - OCP Amendment #00088 / Rezoning #00369 (7025 Herbert Road / 7110 Bates Road)

Use Caution - External Email

See questions below that I would like answered by the City of Vernon and/or developer at the Open House on Oct. 17, 2023:

1. What steps did the City of Vernon and RDNO take to gather input from Herbert Road residents when 7025 Herbert Road was annexed in 2014? Shouldn't there have been an opportunity to provide input in 2013/2014 on the annexation?

2. If this proposed rezoning and development moves forward is the City of Vernon and the developer prepared to compensate Herbert Road homeowners (that are directly impacted) for years of construction noise/traffic and devaluing of our country properties?

3. Is the City and/or developer prepared to buy our property above market value if this development moves forward?

4. As Herbert Road residents living directly across from the proposed complex, that have fulltime home offices, please explain what compensation the developer and/or City is prepared to offer when our home offices are vibrating from heavy construction that impacts our ability to run our home offices and earn an income?

   Note: This is already having an impact because of the Manning Place development and Herbert Road connection.

5. Explain how adding 57 units (plus the additional 29 units on Manning Road) into Country Residential zoned area isn't *Urban Sprawl*?

   Section 3, Page 3:

   "In summary, Administration finds that this proposal is unlikely to encourage sprawl into the rural protection area. Given the close proximity of the subject property to the Foothills Neighborhood

   Plan Area, services and the transportation network and the urgency of meeting the need for multi-family housing, Administration supports increased density on this parcel."

6. Provide details on proposed visual and sound barriers to reduce the impact on Herbert Road rural residents?

   Section 1, Page #2:

   "Given that this parcel is on the urban/rural fringe, a landscape buffer has been included in the design to limit visual impact to the rural large lot properties to the east in the Regional District of

   the North Okanagan (RDNO)."

7. The Foothills Neighborhood Plan, completed in 2013, but did not include the subject property (7025 Herbert Road). How do you now justify applying this plan to the subject property? It appears the document is suggesting it was *close enough* to be immersed into the plan.

   Section 4, Page 3:

   > *The Foothills Neighborhood Plan Area (Plan Area) was endorsed by Council on October 2013.* ***The subject property was not included in the Plan*** *because it was not part of the City of Vernon during the planning process. However, as the subject property is on the immediate eastern boundary of the Plan Area (Figure 3). Given its proximity, Administration considered the Plan Area's policy objectives for residential development in the analysis of this application.*

Todd Fitzpatrick

Barbara Everdene

From: Scott Graham [redacted]
Sent: Thursday, October 12, 2023 11:08 AM
To: Planning
Subject: OCP Amendment #00088 / Rezoning #00369 (7025 Herbert Road / 7110 Bates Road)

Hello

I am writing to express my opposition to this project. I live in the Foothill, on Blackcomb Crt and if this project were to go ahead, will be dealing with the consequences for decades. My opposition stems from the appropriate location of high density housing. While I agree for the need for high density, the location is dependent on its success. Two reasons why this project will not be successful are:

1. Lack of Transit. Due to the lack of transit, each household should be expected to have and use at least 2 vehicles, that adds a tremendous amount of traffic to a single road in and out. This will also increase Vernon's production of green house gas.
2. Lack of Services. High density is a fantastic tool to create community, however, with out services such as grocery stores, coffee shops and other community hubs, this community will just be a bedroom community having to access services away from home.

Keep high density projects close to services, not in rural low density areas.

Thank you for your time and the opportunity to comment.

Scott Graham
[redacted]

Barbara Everdene

From: Janet [redacted]
Sent: Sunday, October 15, 2023 5:00 PM
To: Planning
Subject: OCP Amendment #00088 / Rezoning #00369 (7025 Herbert Road / 7110 Bates Road

Use Caution - External Email

Bates Road "Development"

As a non-resident of the City of Vernon, but a resident of Herbert Road, we have so many questions/comments about this development.

1) Why was this property annexed into the City of Vernon?

This property was part of a development created in the late 70's as "Country Residential". Meaning that unless that property was of a certain size only one residence was allowed – larger lots were allowed a second smaller residence.

2) Density of neighbouring properties.

The adjoining development on Manning Place has 29 residences. The Foothills area does not have high density. The properties on Herbert and Bates have low density. This proposal has 57!! Double its adjoining neighbour!

3) Silver Star Road

As per the traffic study – there "are in order of 10,000 vehicles per day" adding another 57 – 114 vehicles to the "Silver Star 500" is only adding to a road that is ill equipped to handle the existing volume. The proposed traffic circle, to be added in 2024-2025, will not alleviate the flow. And as a side note: How are the logging trucks and heavy equipment going to manoeuvre the traffic circle?

4) Amenities in this Area

There are none. No bus route. No retail. And the new Silver Star Pathway is so severely underused that is could be deemed a waste to money. The only mention of any recreation is the pathway on the southern end of this development. A pathway, that doesn't connect to anything, at this time. A pathway that is encouraging people to use it, but there is no allowance for vehicle parking for users. Will this be a "private" user's path?

5) The Proposed Design of the Development

The strata road entrance/exits are onto roads not maintained by the City of Vernon. The history of maintenance and snow removal on Herbert and Bates is slow (snow plowing can occur 2-3 days after a snow fall). The exit onto Bates is almost in a haphazard place – almost a blind corner.

There needs to be a rethink of this development. It is too dense and ill designed to the property and area.

Jack & Janet Mazereeuw

[redacted] Herbert Road

15 October 2023

Barbara Everdene

From: Eric-Judy STANG [redacted]
Sent: Sunday, October 15, 2023 1:05 PM
To: Planning; Eric-Judy STANG
Subject: OCP Amendment #00088 / Rezoning #00369 (7025 Herbert Road / 7110 Bates Road)

You have not provided a public input form to this amendment as shown on your City of Vernon Website so as the closing of public input will be at the end of the Public Hearing scheduled for October 17th at 7:00pm I am obliged to reach out in writing.
I am a resident of Manning Place and have seen over the past 6 months major changes to our neighborhood. I am not against an individual or business developing a property and like so many tax paying citizens, rely on the governance of City Hall to look after the community best interests. The increase in density to the above project is extreme. I am aware that the city is looking for increased housing capacity but this is not the location for it.
I would hope that common sense would prevail.
In principle, my objections are:

1. No public transportation to the Foothills neighborhood. How are families without multiple vehicles

to access amenities like groceries. Children, especially teenagers will have to rely on family for transportation to
and from extra curricular activities outside of school bus operations.

2. There does not appear to be a designated playground area. One can only assume young children will require

outdoor space as there appears to be very little with this project and the proposed density.

3. Seven (7) fourplexes is not in keeping with what already exists in the Foothills neighborhood. Restricting the use

of four plexes to only three plex units and reducing the number from 7 to 6 would at least be a start to the congestion (reduced by 10 units).

4. Parking issues will always be a problem. Assuming at least one to one- and one-half vehicles per unit where are they all
to park if not on the road. Even on a wide road like the existing Manning Place roadside vehicles are a concern on garbage
collection days and what about winter snow removal. Have these issues really been considered?

5. And lastly, has anyone thought about the impact to the homeowners already on Herbert? Are they not entitled to
some protection?

I leave you with these issues for your consideration. Don't take the easy way out and fall prey to the pressure all communities\
are under to increase their housing commitments.

Respectfully;

Judy Stang
[redacted] Manning Place

Barbara Everdene

From: Esther Wolters [redacted]
Sent: Monday, October 16, 2023 8:50 PM
To: Planning
Subject: Ref OCP00088/ZON00369
Attachments: Vernon Councillors you ask is this exactly what we want.docx

Please see attached document

Vernon Councillors you ask is this exactly what we want?

My answer is NO not at all!
The Bates and Herbert Rd “rural” acreage community have families that have lived on their properties for over 30 years. Newer residents to our neighborhood moved here for the rural country lifestyle. Rural being defined as those that reside in characteristic of the countryside rather than town. A whooping 52 unit strata does not scream rural living.
There is plentiful development happening in the neighboring areas. Above in the Phoenix Dr area as well as in the Foothills. According to council records the Foothills development is not even close to being finished which would create a substantially large amount of housing.
Also between Blackcomb way and Rugg Rd a very large portion has been clear cut for future development. Last but not least Manning Pl is now also under development for even more homes. Which by the way is encroaching on the Bates/Herbert Rd residents. Bates/Herbert Rd was once a “No thru Rd” unbeknownst to its residents unfortunately now receives more traffic due to the development of Manning Pl. As you can see there is ample development going on here. Herbert/Bates Rd does not need 52 more homes lining a developers pockets. While leaving long term Vernonites feeling unheard and unacknowledged, because let’s face it that’s what’s really happening here. Ask yourself this, would you want 52 strata units added to your neighborhood? It has been stated that “52 units has medium environmental sensitivity impact.” That is not to be taken lightly medium does not mean low impact. How is 52 units even considered low density zoning? I read the towns vision for the foothills area. Tell me how does clearing the area of vegetation and housing for animals protect the wildlife corridors? When the amount of people living in an area increases this will also bring in more noise and vehicles. This does not protect our wildlife. I am concerned about the noise pollution that will be created from the Bates/Herbert Rd proposed development. For those unaware noise pollution is defined as the environmental disturbance caused by noise. Examples being construction, increased traffic and neighborhood noise. It can impact not just the health of humans but it can affect wildlife and our livestock, causing them unwanted stress. The light pollution that will be created by this development is also a concern. Light pollution is the excessive or inappropriate use of outdoor artificial light. Which has a disruptive effect on natural cycles and inhibits the observation of stars and planets. It affects human health and wildlife behavior. Our neighborhood has already been dealing with these affects from the above Phoenix Dr, Apex and Nikiska Dr. Etc. developments. This has gone on for years. I am very proud of how low impact our rural neighborhood is on light pollution. As the town is already aware this area is a wildlife corridor for animals to go down to BX creek. We get bears, badgers, cougar, lynx, coyote, deer and owl to name just a few animals we peacefully share our neighborhood with. I cannot say the same for the other developments in the area. I have already noticed a decrease in wildlife in the four areas I previously mentioned. Another concern is the extra construction traffic this development would bring to the neighborhood. My kids walk down from the top of Bates Rd after school and I worry for their safety. The merging of Manning Pl has already brought safety issues. On three separate occasions I have almost been struck by truck drivers from said development cutting the corner at the bottom of Herbert Rd. I am sure other residents have had similar concerning experiences of what was once a quiet no thru rd. Also there is no need to create a new access trail for the BX creek trail system. There is already an accessible walking distance trail entry at the top of Star rd. across from Marmot Ct. There is no need to disrupt more vegetation and wildlife. I hope my concerns will not be taken lightly and hope that they will be acknowledged and considered for our small rural neighborhood. I leave my concerns with a beautiful photo of what this area once looked like. It was pristine in all its glory, sad to say it is not as charming as it once was. We request the property stay RDNO Country Residential. Let’s keep some parts of Vernon Beautiful please.

Regards
-The Wolters and Randle family
[redacted] Herbert Rd

Barbara Everdene

From: Lucas Baldo [redacted]
Sent: Tuesday, October 17, 2023 7:48 PM
To: Barbara Everdene; Planning
Subject: 7025 Herbert Road Questions and Comments

Dear Barbara and Planning Committee,

First off, thank you for the open house and the opportunity to discuss the growth in this area. As encouraged, please find below my concerns with the request to raise these to the Planning Committee and City Council.
I would greatly appreciate brief feedback on these points via return email, if possible.

1. Please explore the potential for the establishment of a firm condition of completion of the roundabout at Bates / Silverstar / Phoenix to ensure safe access to Silverstar Road from Bates Road prior to commencement of Herbert Road development.

- Based on discussion at the open house, the plan is for 2025, but may be pushed as late as 2028, with no firm condition tied to the development of Herbert.
- I would strongly support a condition on the development timeline such that safe egress from Bates Road can be ensured during construction of the development, as well as during occupation when vehicle traffic will be increased.
- As is, it is currently unsafe to turn left from Star Road or Bates Road onto Silverstar with Silverstar traffic often travelling well in excess of the 60 kph limit. This situation will only be worsened by increasing the number of people coming and going.
- The plan already dictates the construction of this roundabout, so please consider the benefit of having this roundabout in place before area occupancy is quadrupled (from roughly 30 current units on Manning Place to approx. 120 units on new Manning and Herbert). I would strongly suggest proactive action to complete the roundabout prior to Herbert development, so Herbert construction vehicles (concrete trucks, semi-trucks carrying gravel, etc.) can safely enter Silverstar Road.
- The construction of the roundabout itself will be an unavoidable inconvenience, so building the roundabout prior to increasing occupancy and therefore traffic in the area is sensible.
- An added benefit is the immediate improvement of safety to Phoenix Road access to Silverstar and calming of Silverstar Road traffic.
- Make sure you put a ladder to get out of the pool before inviting people to try the diving board. Safe egress must be ensured prior to increasing vehicle traffic, not after.

2. No left turn onto Silverstar Road from Star Road.

- This notion was indicated, perhaps erroneously, from the Developer of Manning Place.
- I think this option should be explored. If the roundabout is being built at Bates / Silverstar as a safe means to access Silverstar Road, then its use should be encouraged.
- By placing a barrier across the centerline of Silverstar Road, left turning at Star Road would be discouraged and traffic would be encouraged to use the intended access.

3. Pedestrian Crossing at Silverstar Road

- This is currently an extremely unsafe crossing, requiring stepping over a tall barrier (impossible with a stroller) on the west side of the road, and essentially blind in both directions.
- Crossing at the existing Foothills Drive pedestrian crossing requires walking approximately 250m along the shoulder of Silverstar Road, which is unacceptable.
- Crossing at the proposed Phoenix Road roundabout is approximately 350m from the potential Manning Place crossing.
- Please consider a pedestrian crossing at Manning Place, or at least a safe means to travel Silverstar Road to access the Foothills Drive crossing.
- As of now, the only park in the area is at Whistler Place, approximately 950m from Manning Place. It is unrealistic to expect pedestrians to walk uphill approximately 350m to the new Phoenix Drive crossing, nearly doubling the distance to the park, so it is sensible to facilitate a safe crossing at Manning Place or a safe means to access the Foothills Drive crossing and avoid unsafe crossing.

4. Greenspace / Playground for Manning / Herbert / Bates

- With multi-family housing come families. As of right now, the only play structures are located on the other side of a dangerous Silverstar Road crossing, approximately 1.5 km from 7025 Herbert Road.
- While I see "amenity areas" are foreseen in the plans of 7025 Herbert, there is currently no indication of a play structure.
- Please consider a public play structure and greenspace on the east side of Silverstar Road to allow family access to play areas without use of a car or crossing Silverstar Road.

5. Manning Place Traffic Calming

- Is there a possibility of traffic calming means on Manning Place to discourage speeding?
- For example a small roundabout at the end of the existing Manning place, where the extension of Manning Place is currently underway, to slow uninterrupted speeding down the road and discourage shortcutting via Manning Place and keeping traffic on Silverstar Road.
- The road is not yet finished, so there is time to make this change yet.

6. Shared BX Trail Connection

- a "Shared BX Trail Connection" can be seen in Figure 3 of *7025 Herbert Rd Traffic Impact Assessment*
- Is there a plan to provide access to the BX Creek below via Manning Place or Herbert Road? Where is the access foreseen?

7. Access to 7025 Herbert Road

- As per Page 9 of *7025 Herbert Rd Traffic Impact Assessment :* "the main access could shift to Herbert Road."
- I suggest eliminating this potential. Silverstar to Bates Road offers direct access to 7025 Herbert Road with directing traffic needlessly onto Herbert Road.

Thank you for your time and consideration and looking forward to your feedback.

Lucas Baldo
[redacted] Manning Place
[redacted]

Barbara Everdene

From: Brad Baker [redacted]
Sent: Tuesday, October 17, 2023 10:50 AM
To: Brad Baker; [redacted]; Planning
Subject: Re: Public Input Session - Questions - OCP Amendment #00088 / Rezoning #00369 (7025 Herbert Road / 7110 Bates Road)

Pleased find below questions and concerns regarding the above mentioned proposed OCP Amendment and subsequent development:

Annexation

The property at 7025 Herbert Road was annexed into the City as a single property. It was explained to us (by a current City of Vernon Councilor) that under today's "rules", this may not be permitted and that a minimum of four properties would be required to be annexed as a group. Is this correct and what "rule" does this fall under (Provincial or municipal)?

Reviewing the North Okanagan Regional Growth Strategy (RGS), had the property (7025 Herbert/7110 Bates) NOT been annexed into the City would it had still been within the rural protection area under the RGS bylaw?

Growth Management – comments provided by RDNO/Laura Frank to CoV/Laurie Cordell upon review of the proposal:

"Growth Managament – There do not appear to be any buffers to the adjacent properties, some of which currently have agricultural activities occurring (hobby farms).

Fringe Area Planning

4.5.1 The Regional District encourages adjacent municipalities to consider the rural context and character of Electoral Areas "B" and "C" when reviewing development along the urban/rural fringe.

4.5.2 The Regional District requests that the adjacent municipalities adhere to best management practices regarding development along the Electoral Area "B" and "C" boundary, including participating in collaborative fringe management planning, limiting suburban density, requiring appropriate buffering and discouraging further suburban and urban sprawl into rural and agricultural areas."

- Please explain how the developer plans to respond to the above comments. We note that there is some proposed "vegetation buffer" noted on one of the illustrations, however we also note that the Traffic Impact

Assessment calls for vegetation adjacent accesses to be limited in height to 0.3 m. These seem to contradict each other, how will the buffer be handled?

- 30 units/hectare seems much greater than any neighboring properties and goes against RDNO's recommendation of "limiting suburban density." What is the current density of the Manning Place Development?

4.5.3 Regional District is committed to coordinating efforts with the neighboring municipalities to ensure that growth adjacent to Electoral Area "B" and "C" boundaries occurs in a planned and sustainable manner that reflects the unincorporated rural character valued by the residents of Electoral Area "B" and "C".

- Please explain how the City of Vernon is coordinating with RDNO on this planned development "reflects the unincorporated rural character valued by the residents of Electoral Area B and C?"

Please let it be known that we, Brad and Lori Baker, of [redacted] Herbert Road are concerned with the rezoning of the proposed rezoning of 7025 Herbert/7110 Bates from Country Residential. We purchased our property in good faith (well before the annexation of 7025 Herbert) based on the current CR zoning of all of the properties on Herbert/Bates. We feel that the proposed rezoning, and subsequent proposed development will lessen the enjoyment of our property and neighborhood, and potentially devalue the same. We ask that Vernon City Council NOT support the applications to amend the OCP and land use designation (OCP00088 and ZON00369) and that the prevailing zoning and land use designations of the subject properties remain.

Sincerely

Brad and Lori Baker

[redacted] Herbert Road

Vernon BC.

Barbara Everdene

From: Sue Evans [redacted]
Sent: Tuesday, October 17, 2023 3:47 PM
To: Planning
Subject: RE: Questions - Public Input Session - Questions - OCP Amendment #00088 / Rezoning #00369 (7025 Herbert Road / 7110 Bates Road)

Importance: High

Good afternoon,

I reside on Herbert Road within very close proximity to the proposed 57-unit development, and for the record, I am completely opposed to the rezoning of 7025 Herbert Rd / 7110 Bates Rd from Country Residential to "R5 — Four-plex Housing Residential". How does the addition of 86 units (29 units to be built in the Manning Place subdivision currently under construction) fit in with the **RDNO Official Community Plan for Electoral Districts B and C** stating the following points - see **Fringe Area Planning Policies** - section 4.5.1 (page 42)?

"FRINGE AREA PLANNING POLICIES

- 4.5.1 The Regional District encourages adjacent municipalities to consider the rural context and character of Electoral Areas "B" and "C" when reviewing development along the urban/rural fringe.
- 4.5.2 The Regional District requests that the adjacent municipalities adhere to best management practices regarding development along the Electoral Area "B" and "C" boundary, including participating in collaborative fringe management planning, limiting suburban density, requiring appropriate buffering and discouraging further suburban and urban sprawl into rural and agricultural areas.
- 4.5.3 Regional District is committed to coordinate efforts with the neighboring municipalities to ensure that growth adjacent to Electoral Area "B" and "C" boundaries occurs in a planned and sustainable manner ***that reflects the unincorporated rural character valued by the residents of Electoral Area "B" and "C" residents.***
- 4.5.4 Encourage inter-jurisdictional fringe area planning between the Regional District, District of Coldstream, Township of Spallumcheen and City of Vernon that is respectful and collaborative.
- 4.5.5 Encourage adjacent jurisdictions to provide referrals on applications and issues that relate to land use planning and management to the Regional District, especially along the rural-urban fringe.
- 4.5.6 Work with adjacent jurisdictions, the Ministry of Agriculture and Agricultural Land Commission to protect the Agricultural Land Reserve along the urban-rural fringe.
- 4.5.7 Refer to other agencies, all land use planning applications or issues which may affect another jurisdiction. All affected agencies or municipal Councils, which receive referrals from the Regional District, shall be encouraged to give due consideration and timely responses to referrals."

When 7025 Herbert Road was annexed into the City of Vernon, there was no opportunity for the residents of Herbert Road to provide input. It has also been noted that under current rules, this annexation may not have been permitted. That would be a question for this evening's public input session. Other key factors to be considered are the lack of public transit, lack of amenities in this area, increase in crime (already happening), noise and light pollution, road safety and the impact of heavy traffic and construction on not only the residents of this neighbourhood, but also on the wildlife in this area. Until the start of the Manning Place excavation and bulldozing, we used to see bears and deer (even the occasional lynx) on a regular basis on our property which sits right above the ravine and is part of the wildlife corridor. The ongoing vibrations and noise has not only had a negative impact on our mental and physical health, but I surmise has driven away the wildlife which we have peacefully co-existed with for the last ten years. We are relative newcomers to this beautiful neighbourhood (February 2014), but fiercely care about maintaining its rural charm. When we moved here, the fact that all the properties on Herbert Road had the same zoning made it a safe bet for us to have our "forever" home in the country. Now, not so much…

Please take all of these points under consideration, along with those of our concerned Herbert Road neighbours and friends.

Regards,

Sue Evans

[redacted]

Open House Comment (Anonymous)

October 17, 2023

Traffic volume:

-using Manning Place (small and narrow)

-forcing Manning Pl. to use Star Rd. (which was replaced with Silver Star Rd. for safety reasons)

-# of cars with these 2 new developments

Quadplexes – greedy!!!!

Snow removal priority – snow removal on Manning Place is already a problem. Will Manning Place be given a higher priority for snow removal when Manning Place ceases to be a cul de sac and is joined with Herbert Road?

Attachment 2

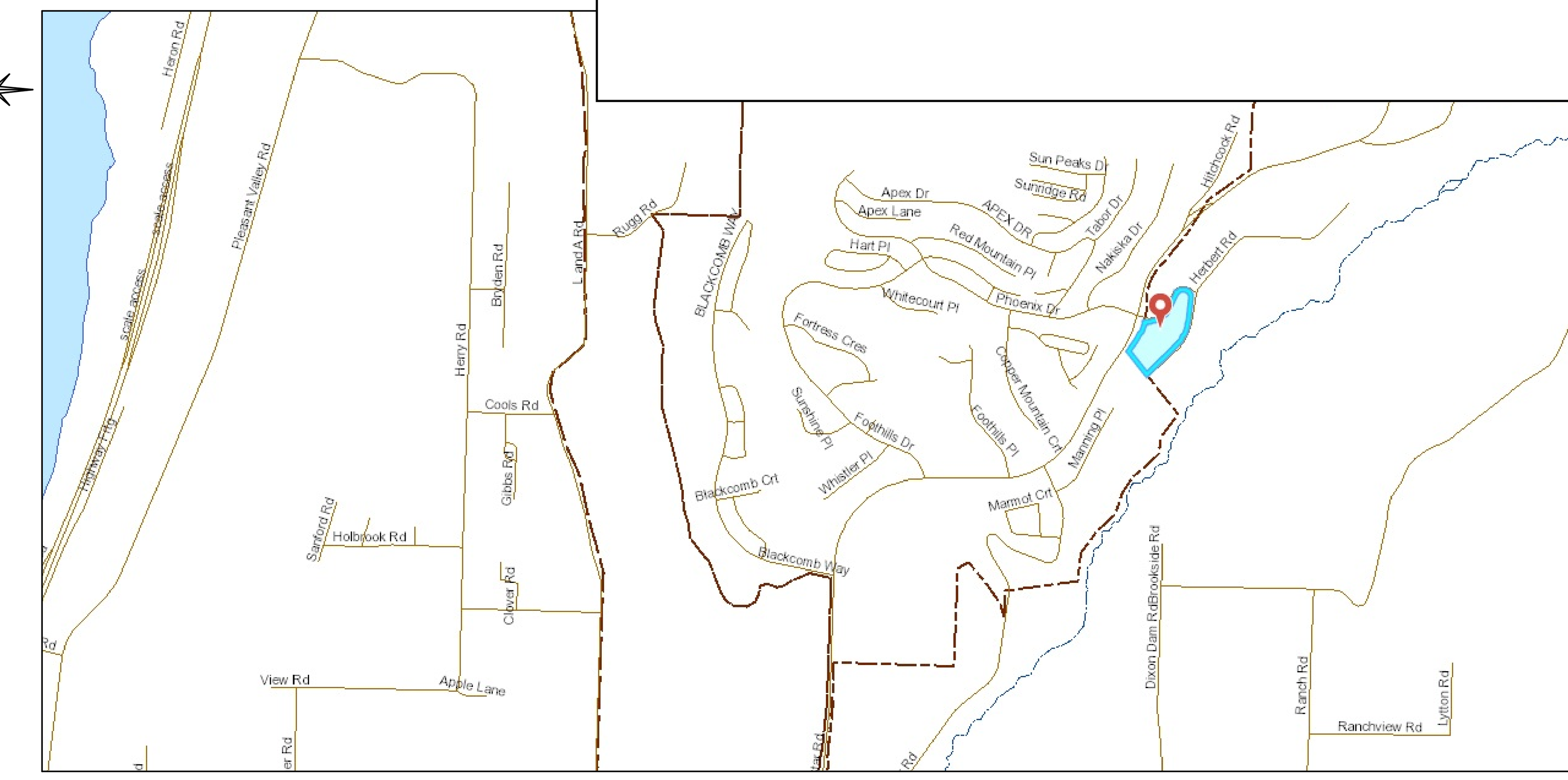
KOFOED GROUP

PROJECT INFO:

CIVIC ADDRESS:
7025 HERBERT RD.

<u>Legal Description:</u>
PID: 004-119-665
Plan: 29910
Lot: 3

TOTAL PROPERTY AREA	20,139.97	SQ. M.	(216,781.6 SQ. FT.)
SITE COVERAGE			
BUILDING FOOTPRINTS	23.5%		(51,068 SQ. FT.)
STRATA ROAD	14.4%		(31,313 SQ. FT.)
TOTAL SITE COVERAGE INCLUDING NON-PERMEABLE SURFACES	37.9%		(82,662 SQ. FT.)



SOURCE: NORTH OKANAGAN MAP(GIS)

GENERAL NOTES

1. ALL CONSTRUCTION AND BUILDING TO BE IN ACCORDANCE TO THE LATEST BRITISH COLUMBIA BUILDING CODE (2018).

2. CONSTRUCTION TO COMMENCE IN ACCORDANCE TO ALL LOCAL BYLAWS.

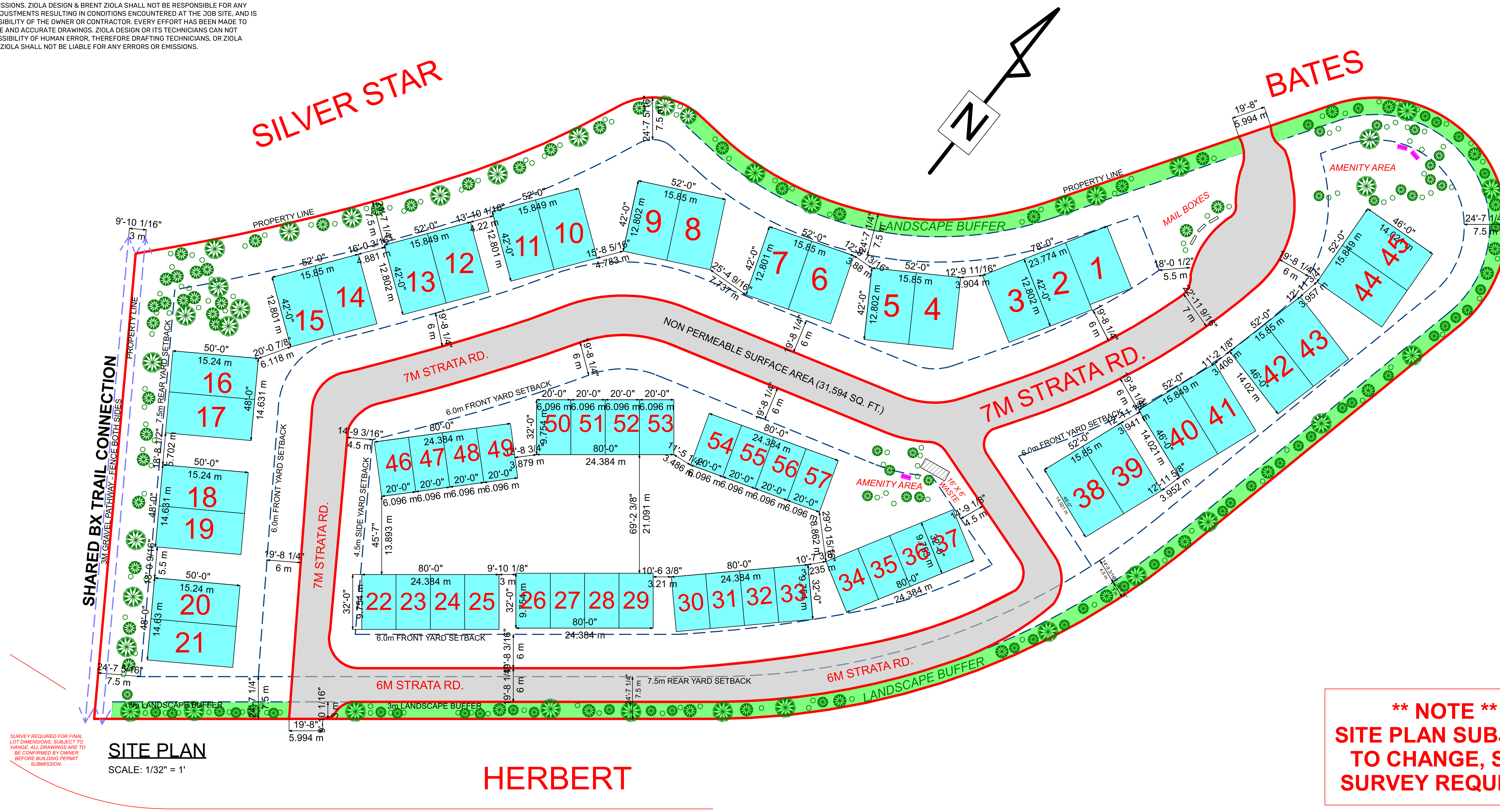
3. DRAWINGS ARE NOT TO BE SCALED. ALL DIMENSIONS ARE TO WALL CENTERLINES AND EXTERIOR OF SHEATHING.

4. CONTRACTORS ARE TO REVIEW ALL DRAWINGS AND REPORT ANY DISCREPANCIES AND ERRORS PRIOR TO CONSTRUCTION.

5. PRIOR TO PROCEEDING WITH CONSTRUCTION THE OWNER/BUILDER IS TO ENSURE ALL REQUIRED INSURANCES AND WORKSAFE BC CONFORMANCE ARE IN PLACE PRIOR TO COMMENCEMENT OF CONSTRUCTION. IT IS THE RESPONSIBILITY OF ALL TRADES TO CHECK AND VERIFY ALL DIMENSIONS AND DETAILS BEFORE COMMENCING CONSTRUCTION.

6. LICENSED AND INSURED PROFESSIONALS MUST VERIFY ALL INFORMATION, DIMENSIONS, SPECIFICATIONS OF THIS PLAN PRIOR TO CONSTRUCTION.

7. ERRORS AND EMISSIONS. ZIOLA DESIGN & BRENT ZIOLA SHALL NOT BE RESPONSIBLE FOR ANY VARIATIONS OR ADJUSTMENTS RESULTING IN CONDITIONS ENCOUNTERED AT THE JOB SITE, AND IS THE SOLE RESPONSIBILITY OF THE OWNER OR CONTRACTOR. EVERY EFFORT HAS BEEN MADE TO PROVIDE COMPLETE AND ACCURATE DRAWINGS. ZIOLA DESIGN OR ITS TECHNICIANS CAN NOT ELIMINATE THE POSSIBILITY OF HUMAN ERROR, THEREFORE DRAFTING TECHNICIANS, OR ZIOLA DESIGN, OR BRENT ZIOLA SHALL NOT BE LIABLE FOR ANY ERRORS OR EMISSIONS.



SITE PLAN

SCALE: 1/32" = 1'

**** NOTE ****
SITE PLAN SUBJECT TO CHANGE, SITE SURVEY REQUIRED

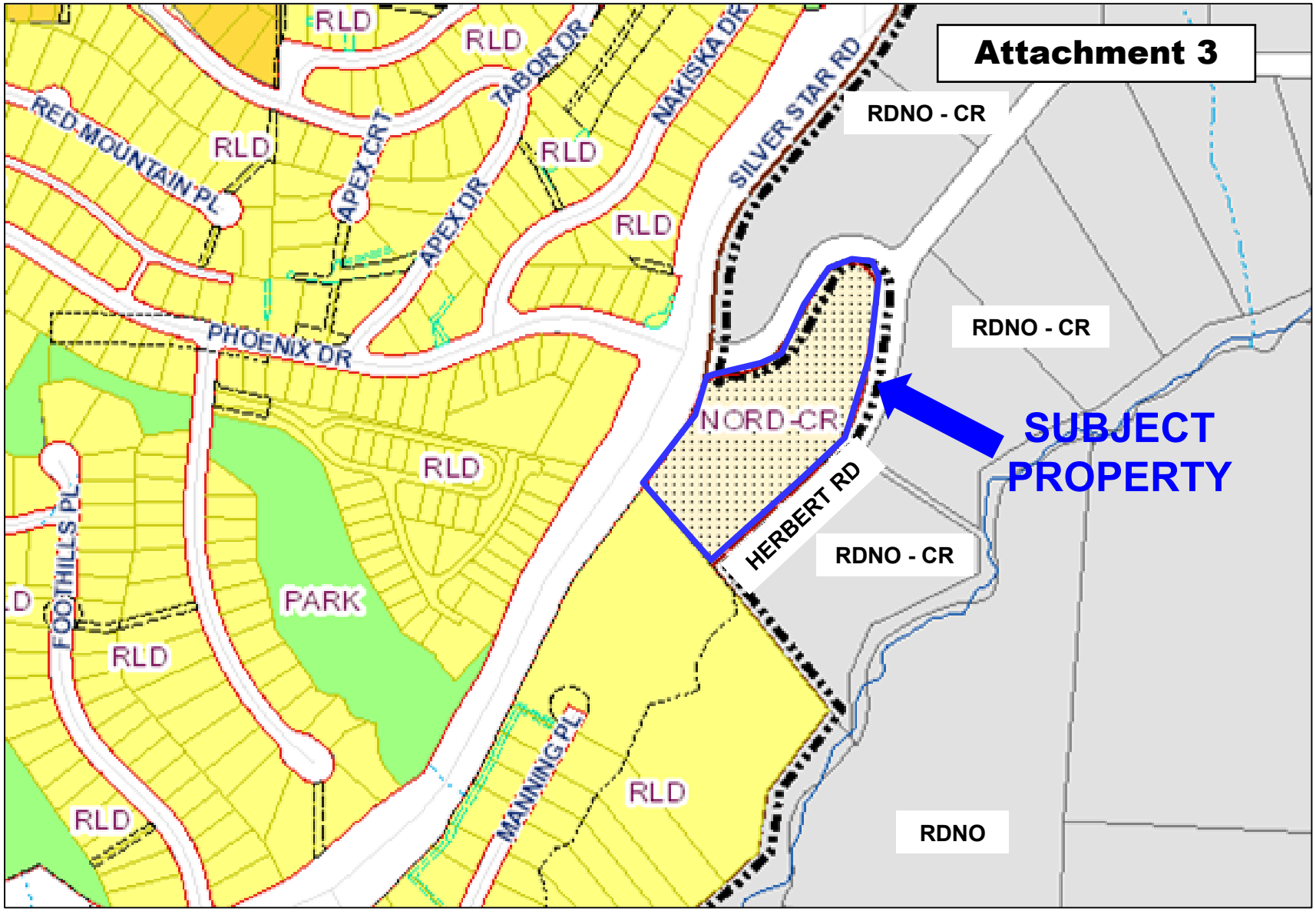
ZIOLA design

URBAN OPTIONS Planning Corp.

KOFOED GROUP

PROJECT TITLE: **HERBERT ROAD VERNON BC**

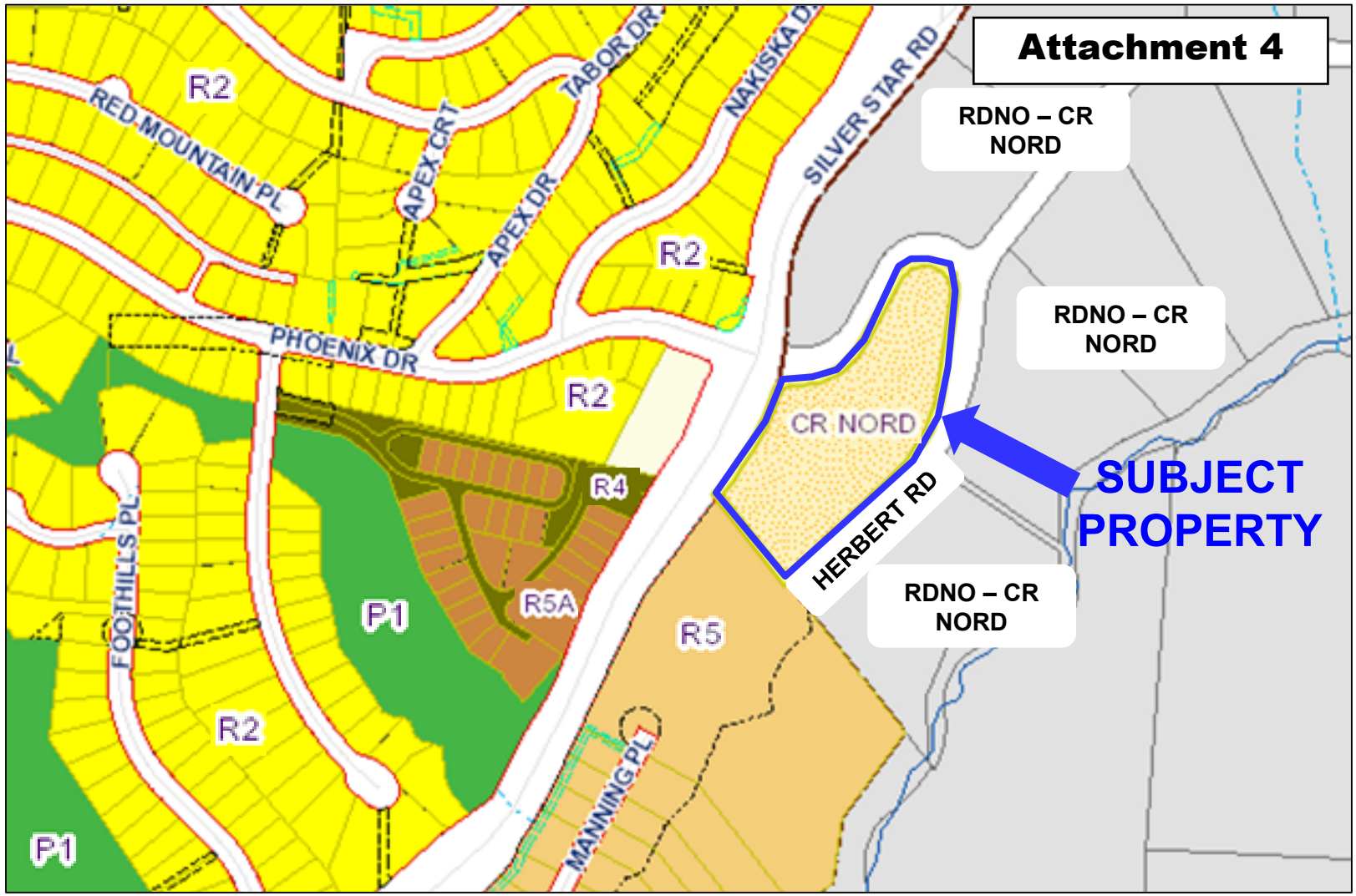
TITLE	
SCALE	
DATE	**MAR-20-2023**
PROJECT NUMBER: **Z-138-02**	DRAWING NUMBER: **1.12**
SHEET	**1 OF 1**



NORD-CR – NORD Country Residential
RLD – Residential – Low Density
PARK – Parks & Open Space

OCP Designation

OCP00088/ZON00369



CR NORD – Country Residential – NORD Bylaw 1888, 2003
R5 – Four-plex Residential
R2 – Large Lot Residential
R4 – Small Lot Residential
R5A – Semi-Detached Residential

Zoning Designation

Attachment 5

Zoning Amendment Application Environmental Impact Assessment

7025 Herbert Road, Vernon, BC

Kofoed Contracting Inc.

TRITON Environmental Consultants

Progressive Aboriginal RELATIONS SILVER LEVEL
Canadian Council for Aboriginal Business

Revision History			
Project Name		Environmental Services 7025 Herbert Road, Vernon, BC	
Project Number		10902	
Report Title		Zoning Amendment Application Environmental Impact Assessment	
Document #		K4196	
Report Author(s)		Patty Skinner and Kellen Smith	
Version	***Date***	***Document Stage***	***Description/Notes***
Rev1.1	19Oct22	Draft	
Rev1.2	21Oct22	Internal Review	
RevA	21Oct22	Client Review	
RevB	09Mar23	Final	
		Choose an item.	

Document Reviews			
Version	***Date***	***Review Type***	***Reviewed by***
V1.1	19Oct22	Peer Review	Patty Skinner, Biologist, Triton
V1.2	21Oct22	Senior Review	Bill Rublee, Senior Biologist, RPBio
		Choose an item.	
		Choose an item.	
		Choose an item.	

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Authentication			
Version (and sections, if applicable)[1]	***Role***	***Name***	***Signature/Date or Professional Seal***[2]
V1.2	Professional of Record	Bill Rublee, RPBio	21Oct22
	Choose		
	Choose		

Notes:

1. In cases where more than one author or Professional of Record have contributed to different parts of the document, they must indicate which sections they are authenticating.

2. Only Professionals of Record are required to stamp or seal documents; however if the author is not the Professional of Record, they are encouraged to also add their signature or stamp/seal if applicable.

Disclaimer

This report is rendered solely for the use of Kofoed Contracting Ltd. (the Client) in connection with the zoning amendment application for a proposed development at 7025 Herbert Road, Vernon, BC (the Project), and no person may rely on it for any other purpose without Triton Environmental Consultants Ltd.'s (Triton) prior written approval. Should a third party use this report without Triton's approval, they may not rely upon it. Triton accepts no responsibility for loss or damages suffered by any third party as a result of decisions made or actions taken based on this report.

The objective of this report is to address the following scope requirements:

- Prepare an Environmental Impact Assessment (EIA) as per the requirements set out by the City of Vernon's Official Community Plan and Environmental Management Areas strategy.

This report is based on facts and opinions contained within the referenced documents, including the results of any data collection programs carried out in relation to this report. We have attempted to identify and consider facts and documents relevant to the scope of work, accurate as of the time period during which we conducted this analysis. However, the results, our opinions, or recommendations may change if new information becomes available or if information we have relied on is altered.

The following assumptions were relied on during the preparation of this report:

- The GIS mapping from the Regional District of North Okanagan (RDNO) is accurate for the needs of this report; and
- The provincial and federal web link mapping resources and layers are satisfactory with respect to reported data.

We applied accepted professional practices and standards in developing and interpreting data. While we used accepted professional practices in interpreting data provided by the Client or third-party sources, we did not verify the accuracy of any such data.

This report must be considered as a whole; selecting only portions of this report may result in a misleading view of the results, our opinions, or recommendations.

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1.0 Introduction

1.1 Project Purpose

Triton Environmental Consultants Ltd. (Triton) was retained by Kofoed Contracting Ltd. (the Client) to complete a habitat assessment and prepare an Environmental Impact Assessment (EIA) at 7025 Herbert Road, Vernon, BC (the Property). The Client has submitted an application to amend the zoning of the Property to the City of Vernon (the City). The services of a qualified professional are required in accordance with the City's Environmental Management Areas (EMA) Strategy (City of Vernon, 2012) to support the zoning amendment application and the Development Permit application for the Property.

1.2 Methodology

This report was prepared through a review of the existing background information including maps, provincial databases, desktop resources, and reconnaissance field visits to the Property. Desktop review was completed prior to the site visit to identify the biophysical resources of the Property, as well as any potential environmental resources including rare and endangered species or critical habitat that could potentially occur. The sensitive ecosystem inventory (SEI) was reviewed, and SEI classifications were determined and verified during the site visit. Additional resources including the City's Official Community Plan (OCP) and EMA Strategy, and the Regional District of North Okanagan (RDNO) ArcGIS website (as well as additional web resources) were used to determine the location of the Property boundaries, Property description, and biodiversity indexes. Site visits were conducted to review the natural resource values associated with the Property and any potential sensitivities associated with the proposed development area. Photographs taken during the site visits are provided in Appendix 1.

1.3 Project Location

The Property is located at 7025 Herbert Road, Vernon and in the RDCO (Figure 1). The PID for the Property is 004-119-665 and it is 2.01 hectares in size. The legal description is Lot 3, Plan No. 29910, Section 18, Township 5, Osoyoos Division Yale District (Table 1). The Property is bounded on the west by Silver Star Road, to the northwest and west by Bates Roads, to the east by Herbert Road, and to the south by a residential development (Figure 2). The foothills residential neighborhood of Vernon is on the west side of Silver Star Road. The City limits end directly north of the Property and north of the Property are rural and agricultural properties.

Table 1. Site description and classifications

Classification	*Description*
Administrative Boundaries	
Forest Region	Thompson Okanagan Region
Forest District	Okanagan Shuswap Forest District
Natural Resource District	Okanagan Shuswap Natural Resource District
Watershed Group	Okanagan River
Regional District	North Okanagan

General Location	
Municipality	Vernon
UTM	11U 342758 E 5575101 N
Ecosystem Classification	
Ecodomain	Dry
Ecodivision	Semi-Arid Steppe Highlands
Ecoprovince	Southern Interior
Ecoregion	Thompson Okanagan Plateau
Ecosection	Northern Okanagan Basin
Biogeoclimatic Ecosystem Classification: Biogeoclimatic Zone Subzone Variant	 Interior Douglas Fir (IDF) Very Dry Hot (xh) Okanagan (1)
Elevation Range (m)	~ 650-670 m ASL

[1]Source: Province of British Columbia, 2021.

1.4 Historic, Current, and Proposed Use and Access

The Property has historically been used for residential and agricultural purposes. Existing structures at the Property include a mixture of residential and farm buildings which include two houses and outbuildings. Vehicle access to the Property and the houses is via two paved driveways, one accessed from Bates Road, and one accessed from Herbert Road. Hiking pathways are located at the end of Herbert Road off of the southern section of the Property. These pathways connect Herbert Road with Manning Place to the south. The Property is currently zoned country residential (CR) and a zoning amendment application has been submitted to the City. The Client proposes to build a multi-unit townhome development on the Property. A preliminary site plan of the proposed development is provided in Appendix 2. These plans are preliminary and are subject to change prior to submission of the Development Permit application and development.

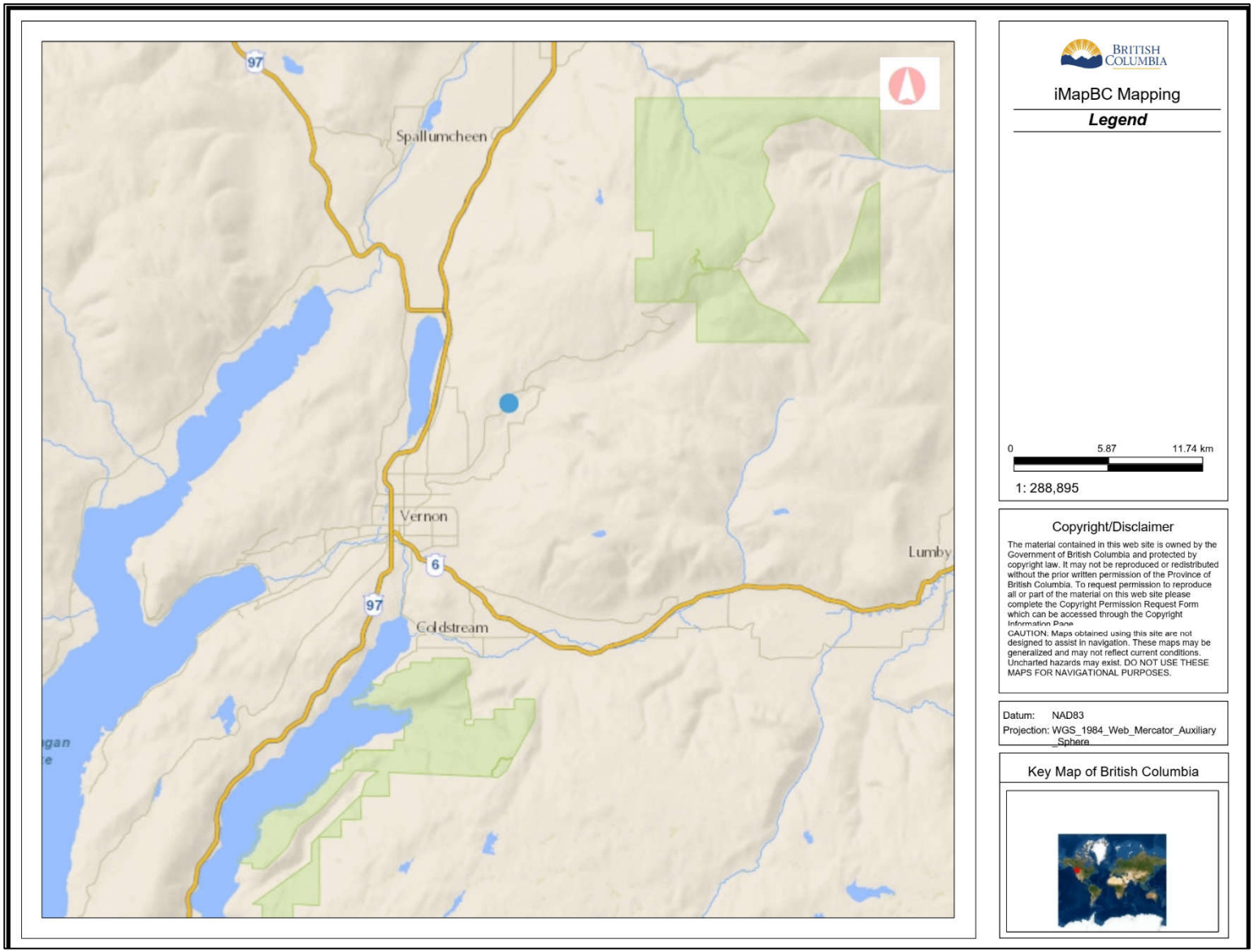

Figure 1. Project location (source: iMapBC)

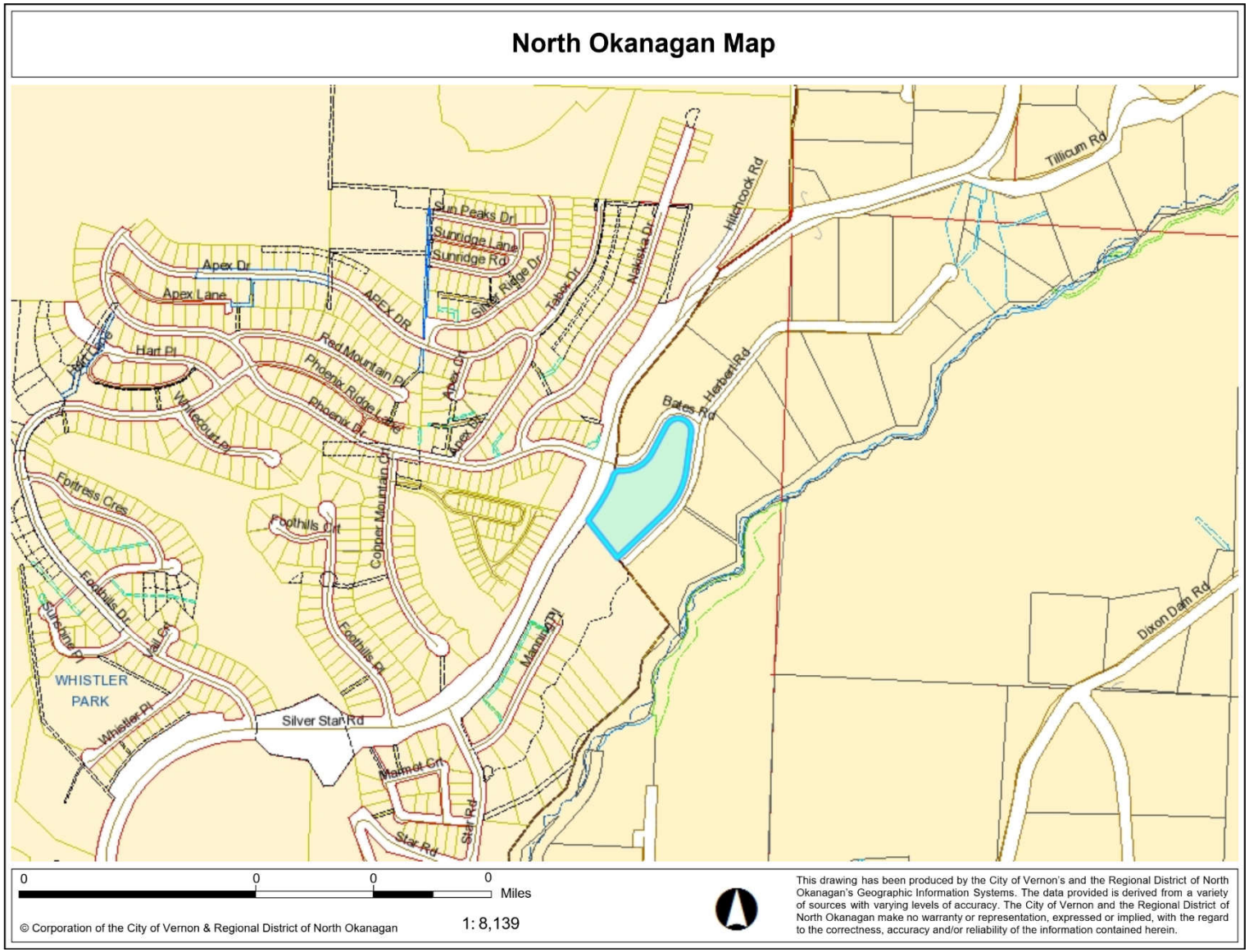

Figure 2. Project location (source: RDNO GIS)

2.0 Background Inventory Review

2.1 Property Overview

A desktop background review was conducted to collect existing information relevant to the area and identify potential environmental sensitivities which could occur within the area using provincial and federal government databases and mapping tools. The background review included searches for mapped watercourses and known occurrences of rare and/or endangered species known to be present or potentially present within the project area. Searches were conducted again in September 2022 to reflect current conditions of the Project area. Databases and sources utilized in the background review included:

- DataBC iMapBC Mapping Tool (DataBC, 2022);
- BC Ministry of Environment's (MOE) Fish Inventories Data Queries (FIDQ) (MOE, 2022);
- Sensitive Ecosystem Inventory (SEI): Vernon to Commonage (Iverson et al., 2005) and SEI: of the Okanagan Valley: Vernon to Osoyoos (Iverson et al., 2008);
- RDNO GIS mapping and associated layers (RDNO, 2022);
- BC Conservation Data Centre (CDC) BC Species and Ecosystems Explorer. (CDC, 2022); and
- The City of Vernon Environmental Management Areas Strategy (City of Vernon, 2012).

2.2 Biogeoclimatic Zone and Climate

According to the Biogeoclimatic Ecosystem Classification (BEC) for BC, the Property exists in the Interior Douglas Fir (IDF) biogeoclimatic zone within the Very Dry Hot subzone Okanagan variant (xh1) (DataBC, 2022). The climate of the Okanagan region is generally very dry as it is in the rain shadow of the Coast and Cascade mountain ranges. Warmest temperatures occur during June, July and August and the coldest month is January. Precipitation is mainly in the form of rain with highest rainfalls occurring in the summer months from May to September. The average amount of precipitation for the Okanagan Valley is approximately 350 mm per year (Meidinger, D., J.Pojar, 1991).

The forests of the IDF BEC zone are dominated by Douglas fir (*Pseudotsuga menziesii*) with sections of lodgepole pine (*Pinus contorta var. latifolia*), with ponderosa pine (*Pinus ponderosa*) found in the lower, drier elevations. The understory is dominated by pinegrass (*Calamagrostis rubescens*), birch-leaved spirea (*Spiraea betulifolia*), Saskatoon (*Amelanchier alnifolia*) and tall Oregon grape (*Mahonia aquifolium*). Soopolallie (*Shepherdia canadensis*) and kinnikinnik (*Arctostaphylos uva-ursi*) are also common understory shrubs. In wetter phases trembling aspen (*Populus tremuloides*) and red-osier dogwood (*Cornus canadensis*) are common. Frequent fires favour Douglas fir due to its thick protective bark (Meidinger, D., J.Pojar, 1991).

2.3 Topography

The topography of the Property is relatively flat on the upper portion of the Property adjacent to Silver Star Road. It gradually slopes to the east and a low spot occurs in the north of the Property at the corner of Bates Road and Hebert Road (Figure 3). There is a small area of pooling water observed in this section of the Property during the field visit in February 2021 which further indicates the low point of the Property.

2.4 Sensitive Ecosystem Ranking

The City's EMA Strategy identifies a three-class rating system which ranks sensitivities of an area from low to high. Each class requires different levels of consideration during development based on their simplified Sensitive Ecosystem Rankings (SER) value. Green or low risk areas are considered previously disturbed and require the lowest level of conservations and protection planning but must also account for site specific conditions. Yellow or medium risk ranking reflect areas with moderate levels of disturbance and moderate sensitivity. Development proposals in these areas are required to consider conservation, protection, and mitigation as part of the development permit application process. Red or high-risk rankings reflect areas with no previous disturbance and high sensitivity. The Property is identified as being medium risk (City of Vernon, 2012).

2.5 Sensitive Ecosystem Inventory

The City's tiered system of EMAs is largely a reflection of the Sensitive Ecosystem Inventory (SEI) works. SEI uses Terrestrial Ecosystem Mapping (TEM) and modelling to identify and predict ecosystems at risk, which can then be used by various levels of government to aid in development planning. SEI ranked the Property as GR:dg (grasslands and disturbed grasslands dominated by invasive species) (Iverson, 2008) (Figure 4). These ecosystems develop following the disturbance of grassland ecosystems, and no longer consist of climax species typical of undisturbed grasslands. These systems differ from grassland ecosystems due to the presence of noxious weed species (10 – 50%). Many of the species who inhabit grassland ecosystems can also find habitat in disturbed grassland ecosystems, and many rare, endangered and protected species are found in these areas (Iverson, 2008).

2.6 Environmental Development District

In addition to the SEI ranking, the City divides development groups into three sectors with different requirements for development permits (DPs). Each Development District is characterized by different proportions of identified low, moderate, and high sensitivity ecosystem polygons to reflect different levels of significance for conservation and protection. The Property is within Development District 3 – Hillside Residential and Agriculture (DD3), which notes steep slope management; ridgeline and hilltop protection; grassland and rangeland management and protection; as key considerations for projects (City of Vernon, 2012). Further, the SEI study identified riparian areas of all types, grassland and rangeland and sparsely vegetated, as well as associated wildlife habitats and potential wildlife corridor areas as sensitive ecosystems of concern in DD3. Other goals for DD3 include:

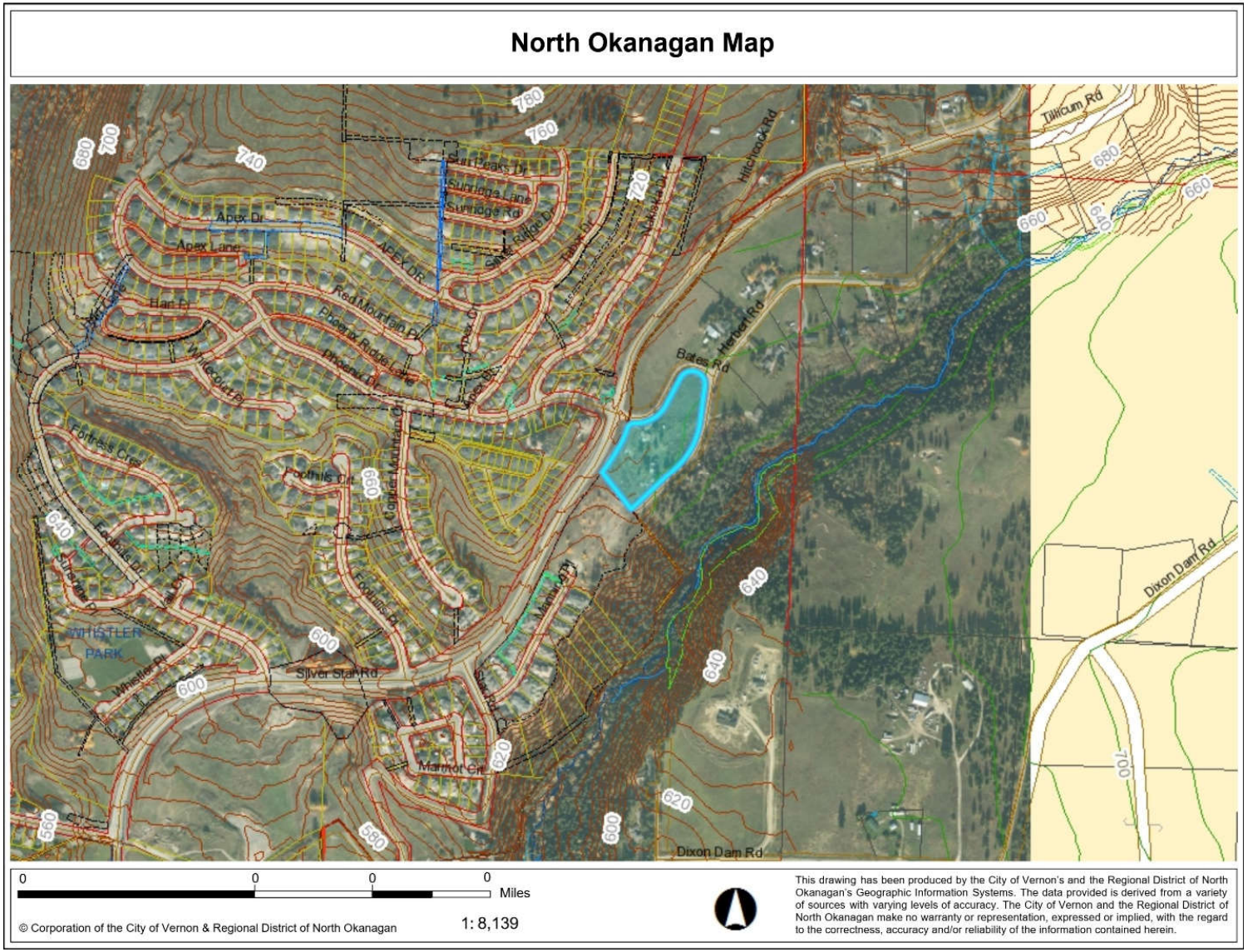

Figure 3. Slope contours (5 m interval-red lines) for the Property (outlined in blue) and surrounding area (source: RDNO GIS)

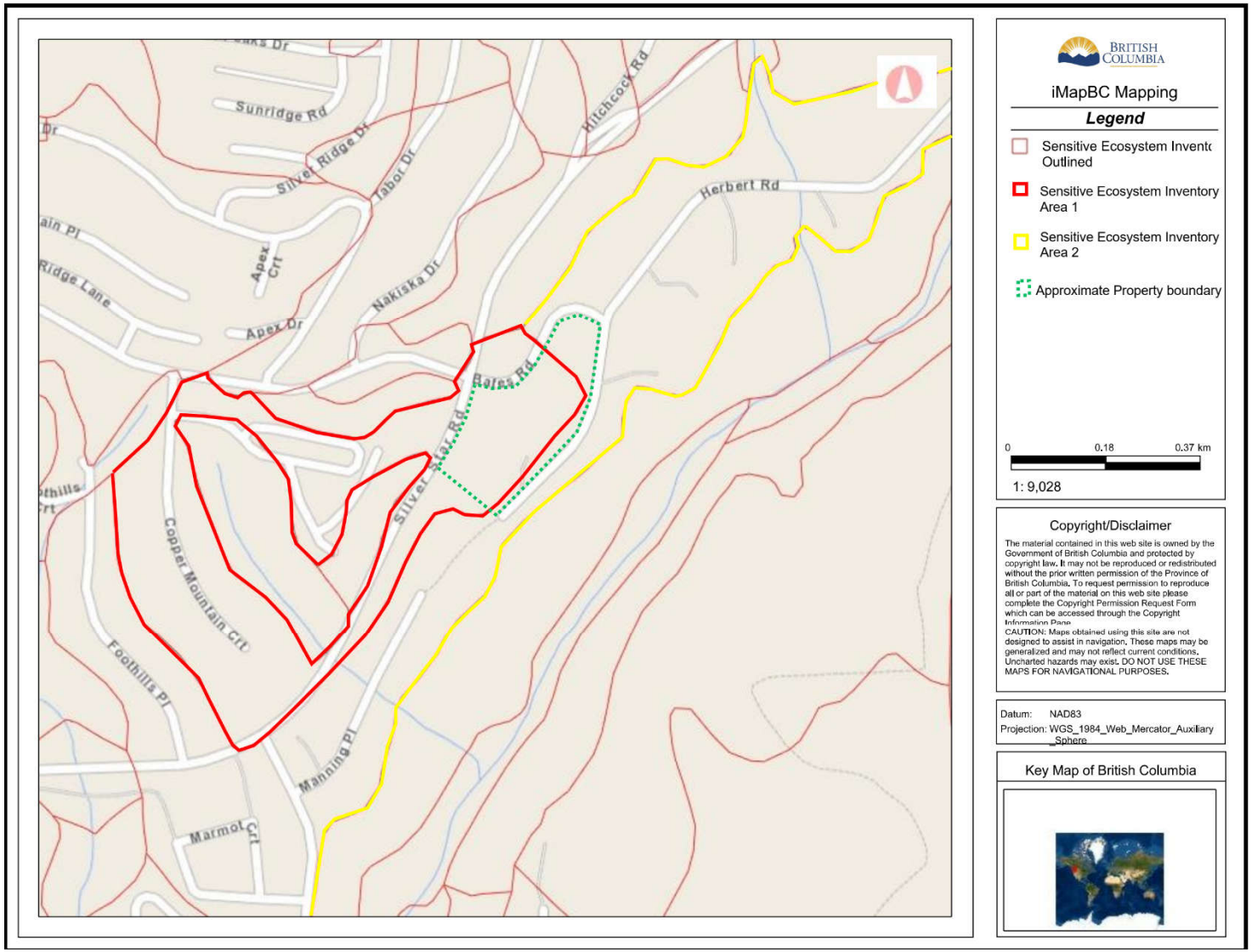

Figure 4. SEI rankings identified at the Property (source: imapBC)

- invasive species management;
- protection of biodiversity;
- maintenance of ecosystem function;
- forest land and fire protection;
- reclaimed water use;
- moderate and high sensitivity ecosystem protection and management; and
- hazard land exclusions from use.

2.7 *Aquatic Resources*

There are no mapped watercourses on the Property. BX Creek (watershed code: 310-939400-08200) is approximately 140 m east of the Property and Herbert Road at the bottom of a steep gully. It is a 3rd order stream, is approximately 24.89 km long, and is one of the largest tributaries to Swan Lake which eventually flows into Okanagan Lake. According to the BC Ministry of Environment's (BC MOE) Fish Inventories Data Queries (FIDQ) system, various fish species have been recorded in BX Creek (Table 2) (Province of BC, 2022).

Table 2. Fish species recorded in BX Creek

Common Name	*Scientific Name*
Bridgeslip Sucker	*Catostomus columbianus*
Brook Trout	*Salvelinus fontinalis*
Burbot	*Lota*
Carp	*Cyprinus carpio*
Prickly Sculpin	*Cottus asper*
Pumpkinseed	*Lepomis gibbosus*
Rainbow Trout	*Oncorhynchus mykiss*
Redside Shiner	*Richardsonius balteatus*
Suckers (general)	*Catostomus* spp.

The outlet of BX Creek to Swan Lake is approximately 7.3 km downstream of the Property. According to the FIDQ, several fish species have been recorded in Swan Lake (Table 3). The lake has been stocked yearly with Rainbow Trout (*Oncorhynchus mykiss*) since 1948 and with Brook Trout (*Salvelinus fontinalis*) between 1967 – 2006 (Province of BC, 2022).

Table 3. Fish species recorded in Swan Lake

Common Name	*Scientific Name*
Bridgeslip Sucker	*Catostomus columbianus*
Brook Trout	*Salvelinus fontinalis*
Burbot	*Lota*
Northern Pikeminnow	*Ptychocheilus oregonensis*
Rainbow Trout	*Oncorhynchus mykiss*

Common Name	Scientific Name
Redside Shiner	*Richardsonius balteatus*
Suckers (general)	*Catostomus* spp.
Yellow Perch	*Perca flavescens*

2.8 Terrestrial Resources

2.8.1 Rare and Endangered Wildlife

Species at risk information is available from provincial and federal sources (Table 4). Provincially, BC MOE maintains information on the BC Species and Ecosystems Explorer for species in the province (CDC, 2022). Data on known species at risk occurrences are available through the BC Conservation Data Centre (BC CDC) online database (CDC, 2022). Federally, the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) was established under Section 14 of the *Species at Risk Act* (SARA) and ranks species. Schedule 1 of SARA provides the list of species at risk. SARA typically only applies to federal land and only aquatic species as defined by the federal *Fisheries Act* and migratory birds listed under the federal *Migratory Bird Act* are protected under SARA on private or provincially owned lands.

Table 4. Definitions of conservation status classifications

Regulation	Status	Definition
COSEWIC (federal)	Endangered (E)	A species facing imminent extirpation or extinction.
	Threatened (T)	A species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction.
	Special Concern (SC)	A species that may become threatened or endangered because of a combination of biological characteristics and identified threats.
BC CDC (provincial)	Red-listed	Species, subspecies, or ecological communities considered to be Extirpated, Endangered, or Threatened.
	Blue-listed	Species, subspecies, or ecological communities considered to be of Special Concern (formerly Vulnerable).
	Yellow	Species or subspecies that is apparently secure and not at risk of extinction.

2.8.2 Wildlife Species at Risk

The Project area has the potential to provide important foraging, breeding, nesting, and travel corridor habitat for rare and endangered wildlife. The CDC database was used to prepare a list of red- and blue-listed wildlife species which have the potential to occur in and around the Project area. Results showed 22 provincially red- (five) or blue-listed (seventeen) animal species could potentially occur within the project area (CDC, 2022) (Table 5).

Table 5. Animal species at risk with potential to occur in Project area

Common Name	Scientific Name	BC Status
American Badger	*Taxidea taxus*	Red
Barn Owl	*Tyto alba*	Red
Barn Swallow	*Hirundo rustica*	Blue

Common Name	Scientific Name	BC Status
Bobolink	*Dolichonyx oryzivorus*	Blue
Columbia Plateau Pocket Mouse	*Perognathus parvus*	Blue
Fringed Myotis	*Myotis thysanodes*	Blue
Gopher Snake, deserticola subspecies	*Pituophis catenifer deserticola*	Blue
Grasshopper Sparrow	*Ammodramus savannarum*	Red
Great Basin Spadefoot	*Spea intermontana*	Blue
Horned Lark, merrilli subspecies	*Eremophila alpestris merrilli*	Blue
Lark Sparrow	*Chondestes grammacus*	Blue
North American Racer	*Coluber constrictor*	Blue
Olive-sided Flycatcher	*Contopus cooperi*	Blue
Preble's Shrew	*Sorex preblei*	Red
Short-eared Owl	*Asio flammeus*	Blue
Spotted Bat	*Euderma maculatum*	Blue
Swainson's Hawk	*Buteo swainsoni*	Red
Townsend's Big-eared Bat	*Corynorhinus townsendii*	Blue
Western Harvest Mouse	*Reithrodontomys megalotis*	Blue
Western Rattlesnake	*Crotalus oreganus*	Blue
Western Skink	*Plestiodon skiltonianus*	Blue
Western Small-Footed Myotis	*Myotis ciliolabrum*	Blue

[1]Search parameters: Animals Okanagan Shuswap Forest District; RDNO; BGC Zone: IDF

2.8.3 CDC Identified Wildlife Occurrences

The CDC database and mapping tool was accessed to identify known occurrences of wildlife species at risk (an area of land and/or water where a species or ecosystem is known to occur) within and in proximity (within 1 km) to the Project area. One rare and endangered animal species occurrence was recorded in the search radius of the Property.

2.8.3.1 American Badger (Occurrence ID No. 74373)

The American Badger (*Taxidea taxus*) is provincially Red-listed and listed as an Endangered species under COSEWIC and SARA (Schedule 1-Endangered). The Property is within a large mapped American Badger range polygon extending from the U.S. border to the north end of Okanagan Lake (ID #74373). The occurrence polygon is inclusive of 498 reported sightings of badgers (most between 1995 and 2012), occurring throughout the polygon, but are concentrated within grassland/agricultural interface zones in the Vernon, Lumby, Mission Creek, Osoyoos, Anarchist Mountain/Rock Creek, and Grand Forks areas (DataBC, 2022).

2.8.4 Critical Habitat

The CDC database and mapping tool was accessed to identify designated critical habitat of wildlife species at risk and in proximity (within 1 km) to the Project area. The

Project area overlaps with proposed critical habitat for the American badger (CDC, 2022).

2.8.4.1 American Badger (Proposed Core Critical Habitat ID No. 73112)

The Recovery Strategy for the American Badger *jeffersonii* subspecies is currently in the public comment period (ECCC, 2021). As part of the recovery strategy, several proposed "core" (necessary to support feeding, foraging, and denning functions) and "safe movement" (necessary to support movement activities to sustain all other life functions) critical habitat polygons for American Badger have been identified. A core polygon overlaps the Property, and several other core and safe movement polygons occur within 1 km of the Project area (BC CDC, 2022). Core critical Habitat ID No. 73112 overlaps the Project area. The polygon is approximately 25 hectares in size.

2.8.5 Vegetation Species-at-Risk

The BC Species and Ecosystems Explorer database (BC CDC, 2022) was searched to determine at risk plant species with the potential to occur in and around the Project area. Results showed 13 provincially Red- (three) and Blue-listed (ten) plants were identified (Table 6).

Table 6. Plant species at risk with potential to occur in project area[1]

Common Name	*Scientific Name*	*BC Status*
American sweet-flag	*Acorus americanus*	Red
blue vervain	*Verbena hastata var. scabra*	Blue
cut-leaved water-parsnip	*Berula erecta*	Blue
dark lamb's quarters	*Chenopodium atrovirens*	Blue
dark-green hawthorn	*Crataegus atrovirens*	Blue
Engelmann's knotweed	*Polygonum engelmannii*	Red
Mexican mosquito fern	*Azolla Mexicana*	Red
orange touch-me-not	*Impatiens aurella*	Blue
peach-leaf willow	*Salix amygdaloides*	Blue
porcupinegrass	*Hesperostipa spartea*	Blue
red-rooted Cyperus	*Cyperus erythrorhizos*	Blue
three-flowered waterwort	*Elatine rubella*	Blue
Tweedy's willow	*Salix tweedyi*	Blue

[1]Search parameters: Plants Okanagan Shuswap Forest District; RDNO; BGC Zone: IDF

2.8.6 CDC Identified Vegetation Occurrences

The CDC database and mapping tool was accessed to identify known occurrences of vegetation species at risk within and in proximity (within 1 km) to the Project area. No vegetation species at risk occurrences were identified (DataBC, 2022).

2.8.7 Ecological Communities

The BC CDC was queried to identify mapped occurrences of rare ecological communities within a 1 km radius of the Project area. Two red-listed ecological communities occur within this radius (Table 7).

Table 7. Mapped ecological communities at risk in the vicinity of the Project area

Occurrence ID	Ecological Community	Scientific Name	BC Status	Comments
81517	trembling aspen / common snowberry/ Kentucky bluegrass	*Populus tremuloides / Symphoricarpos albus / Poa pratensis*	Red	Occurrence is located on the lower slopes of the Okanagan Valley in draws and low-lying areas. It is surrounded by grasslands, areas of rural and agricultural development, and coniferous woodlands.
77540	black cottonwood / common snowberry - roses	*Populus trichocarpa / Symphoricarpos albus – rosa spp.*)	Red	Occurrence is located near the bottom of the Okanagan valley along 5.5 km of BX Creek in a gully (approx.. 150 m south of the Project area). Area is surrounded by coniferous forests and agricultural and urban development.

2.8.8 Masked Occurrences

One "masked occurrence" was identified in the search radius of the property. Masked occurrences are species or ecodata that is considered to be susceptible to persecution or harm is data is publicly available. CDC personnel will be contacted prior to development to determine if the proposed project would impact the species.

3.0 Field Visits and Impact Assessment

3.1 Field Visits

An initial field visit was conducted by Triton on February 25, 2021 to confirm findings of the desktop review and identify additional information and parameters. Representative photographs from the site visit are provided in Appendix 1. The site visit was done when the Property was covered in snow which reduced the ability to survey vegetation. Additional field visits were conducted on September 21, 2021 and September 28, 2022 during snow free conditions. Points of interest at the Property are provided in Figure 5. Additional field surveys are expected to be conducted during the Development Permit stage and prior to development.

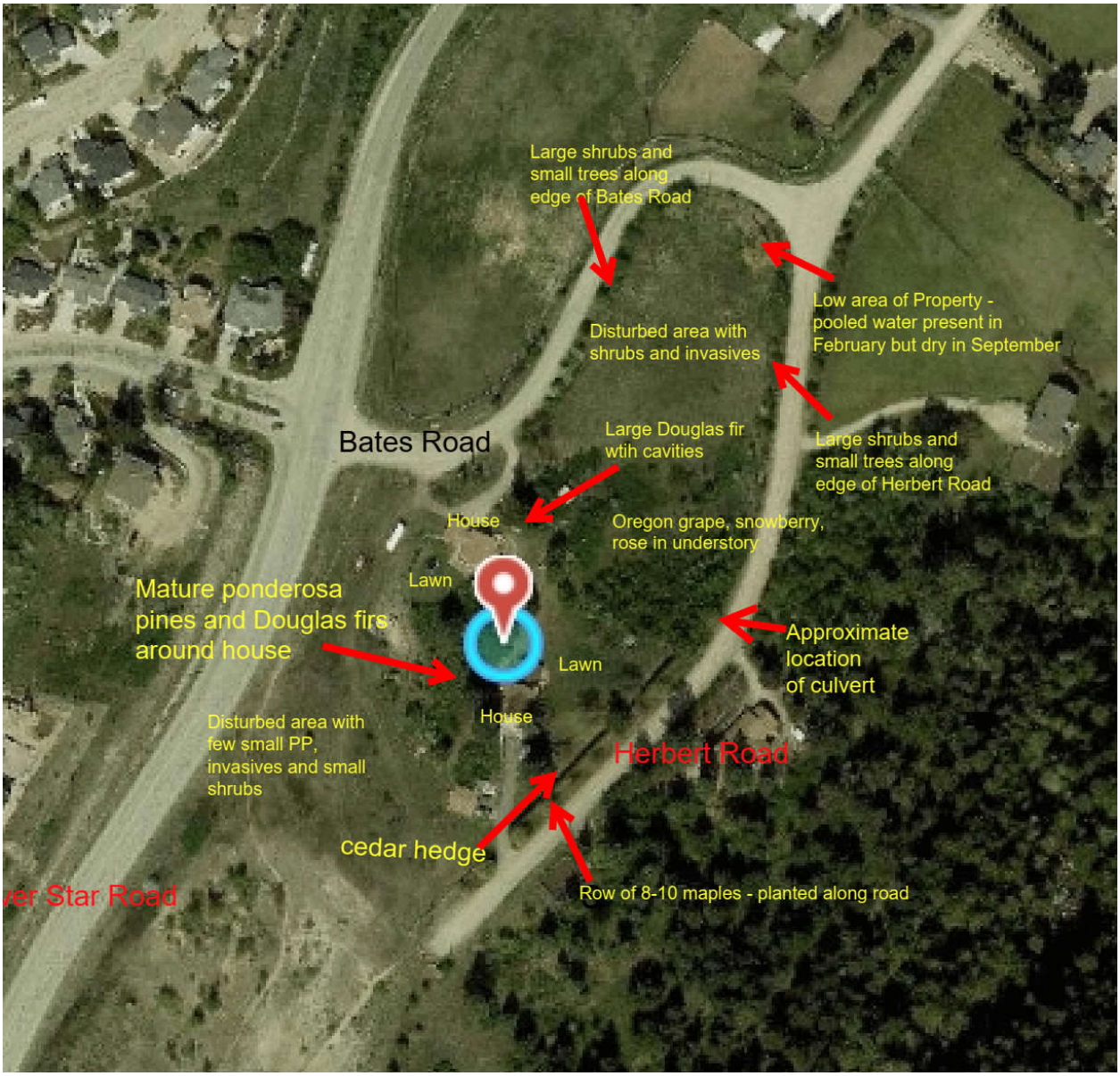

Figure 5. Additional points of interest assessed during field visits

3.2 Terrestrial Resources

3.2.1 Vegetation Resources

The south, west, and north portions of the Property can be described as Disturbed Grassland based on SEI classification and vegetation observed during the field visits. Vegetation in these areas indicate a high degree of anthropologic influence and disturbance and limited native species contributing to habitat or ecological value. These sections of the Property are predominately disturbed fill with forbs, shrubs, and small trees interspersed with non-native and invasive weed species dominant in the understory (Table 8). Young (seral stage) ponderosa pine are interspersed in the southern section of the Property.

Table 8. Dominant non-native vegetation species observed in disturbed areas of the Property

Common Name	Latin Name	Comments
Canada thistle	*Cirsium arvense*	Non-native species associated with the disturbed areas in the southwest and northern portions of the Property. These areas show signs of previous disturbance and placement of non-native fill material.
cheatgrass	*Bromus tectorum*	
common burdock	*Arctium minus*	
dalmatian toadflax	*Linaria genistifolia* ssp. *dalmatica*	
dandelion	*Taraxacum officinale*	
great mullein	*Verbascum thapsus*	
sulphur cinquefoil	*Potentilla recta*	
chicory	*Cichorium intybus*	
rush skeletonweed	*Chondrilla juncea*	

Large, mature trees and areas of native shrubs, forbs, and grasses were observed in the central portion of the Property and adjacent to the two houses (Table 9). Dominant overstory species in this section of the Property consist of ponderosa pine, Douglas fir, trembling aspen, and water birch (*Betula occidentalis*). Willow (*Salix* sp.) and black cottonwood (*Populus balsamifera*) trees were observed along Herbert Road but in lower numbers than the dominant tree species. A densely vegetated area dominated by shrubs including Oregon grape, rose (*rosa* sp., red osier dogwood, hawthorn (*Crataegus sp.*), and common snowberry (*Symphoricarpos albus*) occurs east of the houses and extends down to Herbert Road. Additionally, one mature black cottonwood (*Populus trichocarpa*) tree was observed at the northern area of the Property. An old farm fence borders the Property along Bates Road and Herbert Road. A strip of shrubs occurs between the road and the Property.

Table 9. Dominant native vegetation species observed at the Property

Common Name	Latin Name	Comments (location)
Trees		
black cottonwood	*Populus balsamifera*	Upslope and adjacent to the culvert inlet.
Douglas fir interior	*Pseudotsuga menziesii* var. *glauca*	Multiple mature Douglas fir trees in central portion of Property. One large Douglas fir with several cavities.
ponderosa pine	*Pinus ponderosa*	Multiple mature ponderosa pine trees in central portion of Property and around the

Common Name	Latin Name	Comments (location)
		houses. Young ponderosa pines in disturbed areas.
trembling aspen	*Populus tremuloides*	Groups in various stages in central portion of Property.
water birch	*Betula occidentalis*	Groups in various stages in central portion of Property.
willow	*Salix* sp.	Observed in the low portion of the Property which had pooling water during the February field visit.
Shrubs		
black hawthorn	*Crataegus douglasii*	Along the edge of Bates Road and Herbert Road between the fence and Property.
choke cherry	*Prunus virginiana*	Along the edge of Bates Road between the fence and the Property.
common snowberry	*Symphoricarpos albus*	Dominant understory species which occurs throughout Property in disturbed and undisturbed areas.
mountain alder	*Alnus incana*	Observed in central portion of Property in the densely vegetated, shrub-dominated area upslope of the culvert inlet and Herbert Road.
Oregon grape	*Mahonia aquifolium*	Dominant understory species which occurs throughout the Property in disturbed and undisturbed area.
red-osier dogwood	*Cornus stolonifera*	Observed in central portion of Property in the densely vegetated, shrub-dominated area upslope of Herbert Road.
rose	*Rosa* spp.	Dominant understory species which occurs throughout Property in disturbed and undisturbed area.
Saskatoon	*Amelanchier alnifoli*	Dominant understory species which occurs throughout Property in disturbed and undisturbed area.
smooth sumac	*Rhus glabra*	Along the edge of Bates Road and Herbert Road between the fence and Property.
Forbs		
Arrowleaf balsamroot	*Balsamorhiza sagittate*	Native forbs in understory in central portion of Property.
showy milkweed	*Asclepias speciosa*	Observed along Bates Road and Herbert Road, especially on the northern edge of the Property.
silky lupine	*Lupinus sericeus*	Native forbs in understory in central portion of Property.
yarrow	*Achillea millefolium*	Native forbs in understory in central portion of Property.
Grasses		
bluebunch wheatgrass	*Pseudoroegneria spicata*	Native grass species in understory in central portion of Property.
rough fescue	*Festuca* sp.	Native grass species in understory in central portion of Property.

3.2.2 Wildlife Resources

3.2.2.1 Avian

Several mature ponderosa pine and Douglas fir trees were noted in the central portion of the Property between the two houses. One large Douglas fir near the driveway access to the upper house off of Bates Road has several cavities in the lower portion of the trunk. No other snags or nests were observed during the field visits. No active nests were noted at the time of site visits, but this area could contain both ground and cavity nesting species at appropriate times of the year.

3.2.2.2 Amphibians

Standing water, wetlands, and slow-moving watercourses provide breeding habitat for amphibians and rearing habitat for tadpoles. Upland areas become more important during the adult stage. Within the Property there is a small area of pooled water from recent snowmelt. This pooling did not appear to have inlet or outlet channels and is likely only wet during spring snow melt. This area was dry during the site visits in September 2021 and September 2022. There is a low possibility of amphibian use in this area however it is recommended to survey the Property during the assessments during the Development Permit phase.

3.2.2.3 Reptiles

In general, reptiles prefer warm, drier areas and are negatively impacted by agriculture and urban developments (CDC, 2021). This limits the likelihood of finding key reptile features, such as dens, rock outcrops or fissures, within the Property. Masked occurrences may move through the Property, but overall habitat value is low for reptiles. No key habitat features were identified on site.

3.2.2.4 Mammals

Well vegetated areas can provide thermal protection, cover, foraging habitat, and migratory routes for a variety of mammals including ungulates (Iverson et al, 2008). White-tailed deer (*Odocoileus virginianus*) have the potential to also forage on grasses in the undisturbed portion of the Property. High insect density and mature trees provide forage and nesting habitat for bats (Iverson, 2008). The proximity of roadways and residential areas may limit the area being regularly used by larger mammals.

3.3 Aquatic Resources

There are no mapped watercourses on the Property. BX Creek is located approximately 140 m east of the Property. There is an area in the north-western portion of the Property near the corner of Bates Road and Herbert Road which had pooling water during the field visit conducted in February 2021. This area was dry during the site visits in September 2021 and September 2022. This area occurs on a low spot on the Property and likely collects snow melt during the spring months. A roadside ditch runs along the eastern portion of the Property and Herbert Road. It is densely vegetated with hawthorn and birch, and it ends at a culvert under Herbert Road at approximately the center point of

the Property. The inlet was visible during the site visits, but the outlet could not be found during the initial site visit due to snow cover. The ditch was dry, and no flow or indication of recent flow was observed in the ditch during any of the site visits. The ditch is overgrown with vegetation and there is no indication that a significant amount of flow runs in the ditch for extended periods of time. Directly upslope of the culvert is a section of dense vegetation. There it potential this area historically captured runoff from the upslope portion of the Property. However, the upper portion of the Property adjacent to Silver Star Road has been disturbed with fill and construction of the houses. The culvert outlets at a property across Herbert Road and there was no indication of a channel downstream of Herbert Road observed during the site visits. Based on the field assessments conducted in September 2021 and September 2022, the ditch would not be subject to assessment under the Riparian Areas Protection Regulation (RAPR).

3.4 *Environmentally Sensitive Areas*

The City's EMA Strategy identifies the requirement for stratification of communities within the Property based on their environmental sensitivity (City of Vernon, 2012). This allows for the identification of areas of significant environmental values, or Environmentally Sensitive Areas (ESAs), to take into consideration or avoid during development on the Property. It also allows for the identification of areas on the Property for development opportunities. For the purposes of this report, the ESA ratings were done in a preliminary fashion and were based on the SEI inventory, background information, and observations made during the field visit. Development planning is in the initial stages and the ESAs will be revisited at an appropriate time of year, during the Development Permit process and prior to any development.

4.0 Recommendations During Development

4.1 Proposed Development

At this stage, the Client has submitted a zoning amendment application to the City with an intent to amend the zoning designation of the Property. Preliminary mitigation measures to implement during construction are presented in the following sections. A detailed Environmental Management Plan will be prepared by a Qualified Professional during the Development Permit stage and prior to development.

4.2 Potential Disturbance from Development

Proposed development should limit disturbance to trees or other vegetation as much as feasible. Any trees removed by construction must be compensated for with native vegetation at a rate of 3:1 as per the City's guidelines (City of Vernon, 2012). A list of recommend shrubs and trees for replanting efforts are provided in Table 10. Staking from plants located on site could be the most effective method for ensuring planting success. All planted vegetation should be monitored in subsequent years to ensure success.

Table 10. Suggested plant list for restorative native planting

Tree Species	
Common Name	***Latin Name***
ponderosa pine	*Pinus ponderosa*
Douglas fir	*Pseudotsuga menziesii*
maple spp.	*Acer* spp.
mountain alder	*Alnus tenuifolia*
Shrub Species	
Common Name	***Latin Name***
Saskatoon	*Amelanchier alnifoli*
chokecherry	*Prunus virginiana*
common snowberry	*Symphoricarpos albus*
prickly rose	*Rosa acicularis*
Oregon Grape	*Mahonia aquifolium*
birch leaved spirea	*Spirea betulifolia*
common juniper	*Juniperus communis*
red osier dogwood	*Cornus sericea*
mock orange	*Philadelphus lewisii*
smooth sumac	*Rhus glabra*

4.3 Potential Access

There are two existing accesses to the Property. It is anticipated these existing accesses will be used during construction and as access for the future development and no additional access points should be necessary.

4.4 Further Studies

At this stage a zoning amendment application has been submitted to the City. This EIA report is a required component of the zoning amendment application. This report is

based on the site plan for proposed development that has been provided by the Client (Appendix 2). Prior to development, an updated EIA report and Environmental Management will be prepared.

4.5 Environmental Monitoring Plan

The purpose of this section is to provide recommendations to implement prior to and during development to reduce the potential of negative impacts on the environmental features at the Property. The following section provides recommendations and best management practices to follow during development.

- Silt fencing or snow fence should be placed around the portion of the Property to be developed to identify a limit of construction and protect other areas from encroachment or damage.
- Vehicle traffic and parking areas will be restricted to existing or designated access roads and landings. Roads should be constructed so mud and sediment are not generated between the interface of existing roads and unpaved, undisturbed areas.
- Protect large old trees and snags which provide important wildlife habitat.
- Control invasive species by managing human and vehicular access. Fill with invasives should be removed from the Property and properly disposed of to prevent spread to other areas of the Property.
- Revegetate exposed soils following land alteration to prevent erosion and noxious weed infestation including the replacement of native bunchgrass and wildflowers.
- Timing of development should consider and avoid times of year when critical wildlife activities occur (e.g., bird breeding and nesting) to protect bird nesting habitat as per the *Migratory Bird Convention Act*, the *Migratory Birds Regulations*, and the *BC Wildlife Act*. If this cannot be avoided, a breeding bird nest field survey will be necessary prior to commencement of tree removal activities proposed to occur within the bird breeding and nesting period for the region (April 1 to August 15) (ECCC, 2022).
- Conduct wildlife sweeps prior to construction to identify any American Badger dens. If identified, prepare necessary management plans and implement mitigation measures during construction.
- Retain as much existing vegetation as possible by implementing the following measures during construction:
    - Minimize clearing of vegetation for equipment access and storage wherever possible;
    - Minimize the quantities and duration of on-site material (e.g., soil and aggregate stockpiling) and limit to previously disturbed areas;
    - Physically mark the boundaries of construction to ensure vegetated areas are not unnecessarily cleared; and

  - Washing or disposal of sediment including from equipment into local drainages, ditches, catch basins, storm sewers, etc. will not be permitted.
- Spill containment kits should be onsite and placed on each piece of equipment onsite during construction.
- Work site will be maintained in a clean state - oil containers, cans, grease, tubes, rags, etc. and any other material or packaging will be removed from the work area to an approved disposal location immediately on completion of servicing.
- All equipment used in and around the development must be weed free to minimize the transport of weeds. All contractors should inspect their equipment and vehicles daily to ensure they do not transport noxious weed/seeds onto or off the Property. It is the expectation that equipment will:
  - Be free of weeds and cleaned;
  - Have no leaks and be in good working order; and
  - Have a spill containment kit.
- Topsoil and overburden materials should be obtained from uncontaminated sources and as free of weed seeds as possible.

5.0 Conclusion

This EIA report was prepared to assist in the planning of proposed development areas of the Property. The Property at 7025 Herbert Road, Vernon, BC contains a grasslands: disturbed grasslands classified SEI and moderate risk EMA. Additional field surveys during the warmer growing seasons are required to further assess baseline conditions and ESAs of the Property, potential impacts from development, and mitigation measures to implement during construction to satisfy the requirements of the City's EMA Strategy. The current report and assessments to date have not identified any critical habitats or species at risk that would preclude activities within the proposed development area. However, further assessments and development planning will be required to consider the environmental features and values on the site.

6.0 References

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APPENDIX 1

PHOTOGRAPHS

Photograph 1. View northeast from central area of Property showing disturbed grasslands (February 25, 2021).

Photograph 2. View north towards Silver Star Road showing flat terrain, invasive weeds and limited treed vegetation (February 25, 2021).

Photograph 3. View south showing existing cedar hedging along Herbert Road (February 25, 2021).

Photograph 4. View northeast showing existing maple trees along Herbert Road (February 25, 2021).

Photograph 5. View of pooling water on the Property (February 25, 2021).

Photograph 6. View of ponderosa pine stand mid-Property (February 25, 2021).

Photograph 7. View northeast of vegetated ditch adjacent to Herbert Road (February 25, 2021).

Photograph 8. View of densely vegetated area on the Property upslope of the culvert inlet (February 25, 2021).

Photograph 9. View of the house and driveway accessed from Herbert Road on the lower portion of the Property (February 25, 2021).

Photograph 10. View of the area around the culvert inlet under snow cover (February 25, 2021).

Photograph 11. View of shrubs on edge of Property adjacent to Bates Road (September 28, 2022).

Photograph 12. View south of Property from Bates Road. This portion of the Property has been previously disturbed and is dominated by non-native vegetation (September 28, 2022).

Photograph 13. View of the low spot on the Property at the corner of Bates Road and Herbert Road. This area was dry during the site visit in September 2021 (September 21, 2021).

Photograph 14. View of the low spot. This area was dry in September 2022 (September 28, 2022).

Photograph 15. View south of ditch on the side of Herbert Road. The ditch was dry and overgrown with vegetation during all site visits (September 28, 2022).

Photograph 16. View of shrubs and vegetation on edge of Property adjacent to Bates Road (September 28, 2022).

Photograph 17. Downslope view of the culvert inlet at Herbert Road (September 21, 2022).

Photograph 18. Downstream view of the culvert inlet (September 28, 2022).

Photograph 19. View of the culvert inlet at Herbert Road (September 28, 2022).

Photograph 20. View upslope of densely vegetated area upslope of culvert inlet (September 28, 2022).

Photograph 21. View south of planted maple trees along Hebert Road (September 21, 2022).

Photograph 22. View of the driveway and lawn near the house on the lower portion of the Property accessed from Herbert Road (September 21, 2022).

Photograph 23. View of the lawn and cedar hedges at the edge of the Property adjacent to Herbert Road (September 21, 2022).

Photograph 24. View of the lawn of the house on the lower portion of the Property (September 28, 2022).

Photograph 25. Upslope view of the house on the lower portion of the Property (September 28, 2022).

Photograph 26. View of the disturbed area (Canada thistle and other non-native species) on the portion of the Property south of the house on the lower portion of the Property (September 28, 2022).

Photograph 27. View of house on the upper portion of the Property accessed from Bates Road (September 28, 2022).

Photograph 28. View north of the upper portion of the Property east of Silver Star Road (September 28, 2022).

Photograph 29. View south of the upper portion of the Property east of Silver Star Road. The foothills neighbourhood is shown in the right-hand side of the photograph (September 28, 2022).

Photograph 30. Large Douglas fir tree with multiple cavities near the driveway of the house on the upper portion of the Property (September 28, 2022).

APPENDIX 2

PPRELIMINARY SITE PLAN

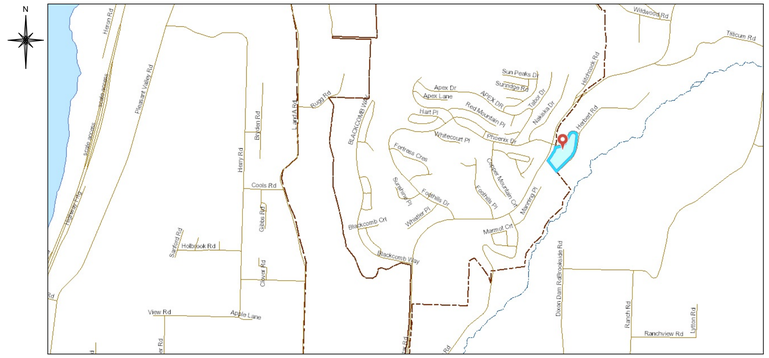
KOFOED GROUP

PROJECT INFO:

CIVIC ADDRESS:
7025 HERBERT RD.

Legal Description:
PID: 004-119-665
Plan: 29910
Lot: 3

TOTAL PROPERTY AREA	20,139.97	SQ. M.	(216,781.6 SQ. FT.)
SITE COVERAGE			
BUILDING FOOTPRINTS	23.5%		(51,068 SQ. FT.)
STRATA ROAD	14.4%		(31,313 SQ. FT.)
TOTAL SITE COVERAGE INCLUDING NON-PERMEABLE SURFACES	37.9%		(82,662 SQ. FT.)



SOURCE: NORTH OKANAGAN MAP(GIS)

GENERAL NOTES

1. ALL CONSTRUCTION AND BUILDING TO BE IN ACCORDANCE TO THE LATEST BRITISH COLUMBIA BUILDING CODE (2018).

2. CONSTRUCTION TO COMMENCE IN ACCORDANCE TO ALL LOCAL BYLAWS.

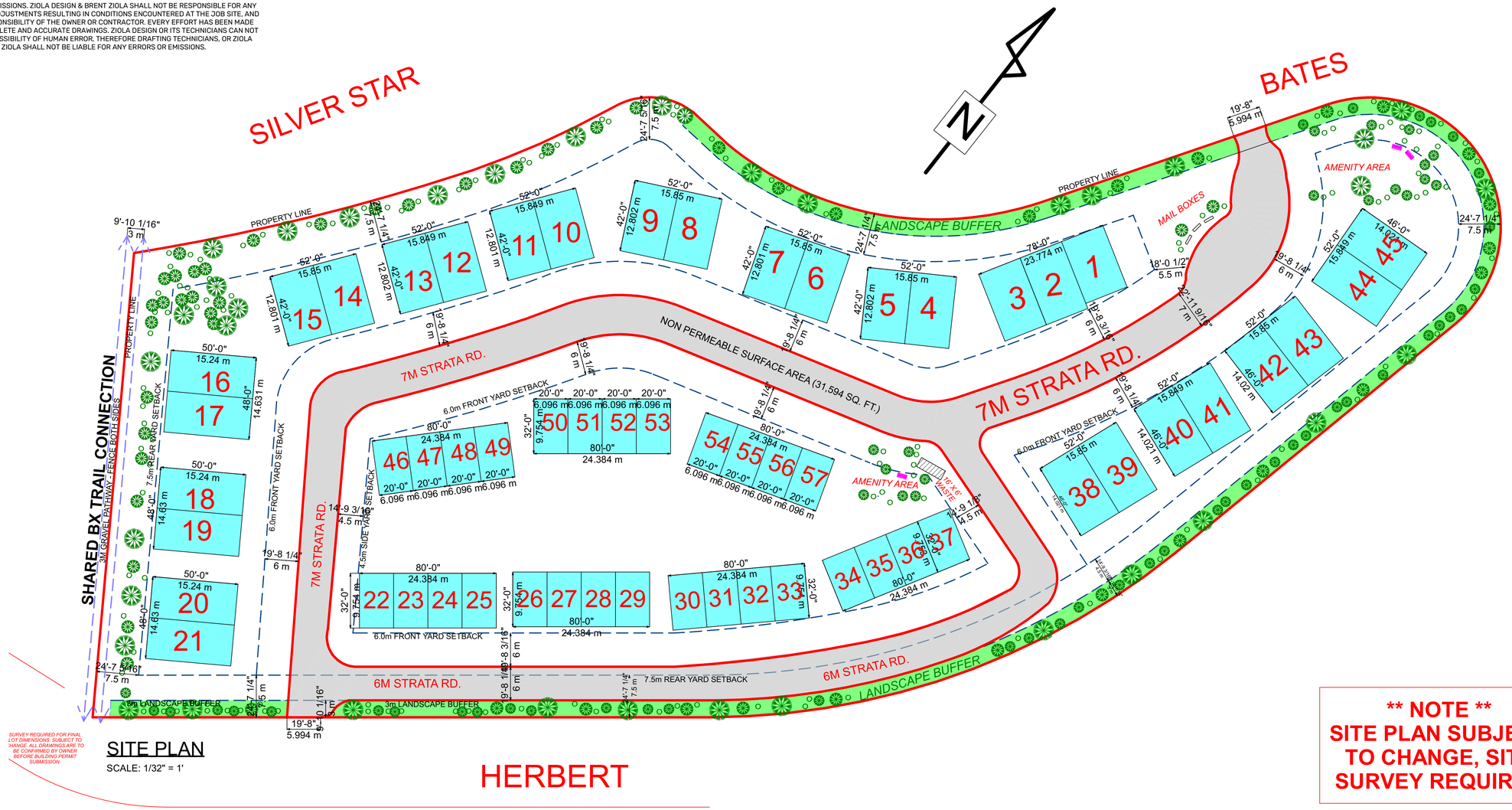
3. DRAWINGS ARE NOT TO BE SCALED. ALL DIMENSIONS ARE TO WALL CENTERLINES AND EXTERIOR OF SHEATHING.

4. CONTRACTORS ARE TO REVIEW ALL DRAWINGS AND REPORT ANY DISCREPANCIES AND ERRORS PRIOR TO CONSTRUCTION.

5. PRIOR TO PROCEEDING WITH CONSTRUCTION THE OWNER/BUILDER IS TO ENSURE ALL REQUIRED INSURANCES AND WORKSAFE BC CONFORMANCE ARE IN PLACE PRIOR TO COMMENCEMENT OF CONSTRUCTION. IT IS THE RESPONSIBILITY OF ALL TRADES TO CHECK AND VERIFY ALL DIMENSIONS AND DETAILS BEFORE COMMENCING CONSTRUCTION.

6. LICENSED AND INSURED PROFESSIONALS MUST VERIFY ALL INFORMATION, DIMENSIONS, SPECIFICATIONS OF THIS PLAN PRIOR TO CONSTRUCTION.

7. ERRORS AND EMISSIONS. ZIOLA DESIGN & BRENT ZIOLA SHALL NOT BE RESPONSIBLE FOR ANY VARIATIONS OR ADJUSTMENTS RESULTING IN CONDITIONS ENCOUNTERED AT THE JOB SITE, AND IS THE SOLE RESPONSIBILITY OF THE OWNER OR CONTRACTOR. EVERY EFFORT HAS BEEN MADE TO PROVIDE COMPLETE AND ACCURATE DRAWINGS. ZIOLA DESIGN OR ITS TECHNICIANS CAN NOT ELIMINATE THE POSSIBILITY OF HUMAN ERROR, THEREFORE DRAFTING TECHNICIANS, OR ZIOLA DESIGN, OR BRENT ZIOLA SHALL NOT BE LIABLE FOR ANY ERRORS OR EMISSIONS.



SURVEY REQUIRED FOR FINAL LOT DIMENSIONS. SUBJECT TO CHANGE. ALL DRAWINGS ARE TO BE CONFIRMED BY OWNER BEFORE BUILDING PERMIT SUBMISSION.

SITE PLAN
SCALE: 1/32" = 1'

**** NOTE ****
SITE PLAN SUBJECT TO CHANGE, SITE SURVEY REQUIRED

ZIOLA DESIGN
URBAN OPTIONS Planning Corp.
KOFOED GROUP

PROJECT TITLE
HERBERT ROAD
VERNON BC

TITLE	
SCALE	
DATE	DEC-20-2022
PROJECT NUMBER	Z-138-02
DRAWING NUMBER	1.11
SHEET	1 OF 1

- INTERIOR -
TESTING SERVICES
- LTD. -

MATERIALS TESTING • SOILS
CONCRETE • ASPHALT • CORING
GEOTECHNICAL ENGINEERING

#1 – 1965 MOSS COURT
KELOWNA, B.C. V1Y 9L3
250-860-6540
INFO@INTERIORTESTING.COM

Kofoed Contracting Ltd
11925 McGowan Road
Kelowna, BC V4V 1J2

March 2, 2021
Job 21.094

Attention: Mr Merlin Kofoed

Dear Sir;

Re: **Preliminary Geotechnical Report**
Proposed Residential Subdivision
7025 Herbert Road
Vernon, BC

As requested, and further to our email proposal dated February 22, 2021, Interior Testing Services Ltd (ITSL) has carried out a preliminary geotechnical investigation for the proposed residential subdivision. Please find the following information attached to this letter report:

- Site Plan : Drawing 21.094-1
- Typed Test Pit Soil Logs : Drawings 21.094-2 to 21.094-5
- Preliminary Subdivision Layout Plan : Drawings 21.094-6

At the end of this letter report, we attach a copy of our standard two-page "Terms of Engagement" that governs our work on this project, previously accepted and signed.

We understand this report is to be submitted to the City of Vernon as part of your permit application. We identify the City of Vernon as an authorized user of this preliminary report, subject to the attached "Terms of Engagement".

1.0 INTRODUCTION

As per our proposal, and as shown on the attached preliminary subdivision layout plan (Drawing 21.094-6), ITSL understands that currently a total of 46 units are proposed for the subject property. In addition, onsite roads, driveways and site servicing will also be constructed as part of the overall development of the site.

From their email of February 19, 2021, ITSL understands that the City of Vernon requires a preliminary report discussing the feasibility of the development from a geotechnical perspective.

The purpose of our investigation was to identify the underlying soil and groundwater conditions with respect to preliminary geotechnical comments with respect to site suitability for development. The following report presents our investigation and laboratory results, along with recommendations for further investigations and preliminary site suitability comments.

2.0 SITE DESCRIPTION

The subject site is located at 7025 Herbert Road in Vernon, BC. The property is irregularly shaped and it is our understanding that it is approximately 2 hectares (4.9 acres) in plan area. The middle or west-middle of the site is generally the local highpoint, with the topography typically sloping down in all directions. There are two homes on the property, one of which (off Bates Road) appears to have been built up locally with fill. The other home, to the east end (off Herbert Road), may have been constructed after some excavation into the existing slope.

There are a variety of local bushes onsite and several areas of mature trees. The northeast corner of the site is low relative to the adjacent roadways, and likely acts as a collection area for drainage and storm water. No readily or easily visible drainage infrastructure was observed in this area.

The subject property is bordered by roadways to the west, north and east and private property to the south.

3.0 GEOTECHNICAL INVESTIGATION

On February 25, 2021, a tracked excavator provided by the client was used to advance a total of four test pits (TP) across the site to as deep as roughly 3 m below the existing site surface grades. The soil profile of each test pit was continuously logged in the field by ITSL staff and occasional, representative samples were recovered and returned to our laboratory for additional analysis. In addition, one standpipe piezometer was installed within TP2 to allow for future groundwater monitoring.

Locations of the test pits are approximately shown on the attached site plan (Drawing 21.094-1) which was adapted from the City of Vernon online mapping resource.

4.0 RESULTS

4.1 Soil Profile and Groundwater Conditions

The detailed soil descriptions are shown on the attached test pit logs (Drawings 21.094-2 to 21.094-5), which are to be used in preference to the generalized soil descriptions that follow.

In general, the site appears to be covered with a layer of topsoil materials and / or silty overburden. Following the topsoil material, natural, silty SANDs and GRAVELs were typically encountered to the base of each test pit. These natural, silty materials were difficult to dig through and were noted in the field as compact to very dense, and often described as "till-like".

No groundwater or seepage was observed in any of the test pits at the time of the investigation. As a general comment, groundwater levels may vary seasonally and will likely be affected by drainage and infiltration conditions. Moreover, as mentioned above, the northeast section of the site may collect storm and drainage water as it is below the adjacent road grades, and no readily visible drainage infrastructure was observed during our field visit.

4.2 Laboratory Work – Moisture Content

Given the preliminary nature of this scope of work, the samples recovered were only tested for moisture content. The oven-dried samples had moisture contents ranging from 5 to 12%.

5.0 GEOTECHNICAL RECOMMENDATIONS

5.1 Additional Geotechnical Investigations and Analysis

In order to confirm that the site is safe for the use intended, ITSL recommends a follow up geotechnical investigation be completed.

The follow up geotechnical investigation should include a site review to further evaluate potential geotechnical hazards and at least 4 additional test pits should be advanced. Additional sampling of the soils is recommended so that adequate laboratory analysis can be carried out with respect to re-using the natural materials as fill, the subgrade strength of the existing materials, and the potential bearing pressures to be preliminarily used for residential foundation design. Other geotechnical items to be addressed include but are not necessarily limited to, site stripping, engineered fill materials and slope finishing.

In addition, some site survey sections through the property will also be useful in further identifying potential slope related issues. ITSL also recommends that we be provided with the final subdivision layout schemes, as well as the site grading plans.

As needed, ITSL can prepare a proposal for this scope of work, including budget estimates.

5.2 Preliminary Site Suitability for Development

Subject to the recommendations above and based on our observations of the four test pits that were advanced on February 25, 2021, it appears reasonable in our opinion to preliminarily conclude that the land can likely be used safely for the use intended, which at this time is support of future roadways, servicing infrastructure and typical residential foundations.

At this time, the City of Vernon has not provided a design level of safety for consideration, and to the best of our knowledge there is no generally accepted level of landslide safety in British Columbia. However, ITSL understands that the British Columbia Ministry of Transportation and Infrastructure (MoTI) commonly accepts an assessment of probability of landslide occurrence less than 10% in 50 years (1 in 475), in reference to a landslide that can cause injury to persons or severe damage to the home. This probability of occurrence appears to be reasonable, at this preliminary stage of the design.

Based on the City of Vernon email of February 19, 2021, which notes that the initial report can be preliminary, ITSL anticipates that the above comments will be satisfactory at this time.

6.0 CONCLUSIONS

As requested, ITSL has carried out a geotechnical investigation on the subject property with respect to the proposed residential subdivision. Recommendations for further investigations and analysis have been provided above, and our preliminary comments on site suitability for development are also discussed above.

Please forward the final proposed subdivision layout scheme and the site grading plans.

We trust the above comments are sufficient at this stage. After your review, please feel free to call and discuss if you have any questions.

Best Regards,
Interior Testing Services Ltd

Prepared By:

Jeremy Block, P Eng
Senior Geotechnical Engineer

Reviewed By:

Peter Hanenburg P Eng
Principal Geotechnical Engineer

Revision No.	Date	Comments
1.0	March 2, 2021	Issued for use.

LEGEND

+/- *TEST PIT LOCATION*

NOTES

1. *REFERENCE PLAN ADAPTED FROM THE CITY OF VERNON ONLINE MAPPING RESOURCE.*
2. *TEST PIT LOCATIONS ARE APPROXIMATE AND MAY VARY FROM THAT SHOWN.*
3. *FOR DETAILED SOIL DESCRIPTIONS REFER TO TEST PIT LOGS (DRAWINGS 21.094-___ TO 21.094-___).*

KOFOED CONTRACTING LTD	*SITE PLAN*	*INTERIOR TESTING SERVICES LTD* *1-1965 MOSS COURT, KELOWNA, BC V1Y 9L3* *PH: 250-860-6540 E-MAIL: INFO@INTERIORTESTING.COM*
PROPOSED SUBDIVISION *7025 HERBERT ROAD* *VERNON, BC*		*DATE OF INVESTIGATION: FEBRUARY 25, 2021* *JOB NUMBER: 21-094* *DRAWING NUMBER: 21-094-1*

TEST PIT LOGS

February 25, 2021
Job 21.094

Soil Profile Review
Proposed Subdivision
7025 Herbert Road
Vernon, BC

Notes:
1. Depths shown are in meters, measured from ground surface at the test pit locations.
2. All test pits were excavated using an excavator provided by the client on February 25, 2021.
3. No groundwater was encountered unless otherwise noted below.

TP 1 – South End

		Sample / Moisture Content
0.0 – 0.15	Topsoils and overburden material.	
0.15 – 3.0	Brown, dense to very dense, silty, fine SAND, some gravel, occasional cobble.	***S1 – 0.6 m / 7%*** ***S2 – 2.1 m / 7%***
3.0	Base of test pit.	

Site Photo 1 – TP1

DRAWING 21.094-2

TEST PIT LOGS

February 25, 2021
Job 21.094

TP 2 – West End

		Sample / Moisture Content
0.0 – 0.45	Brown, silty SAND and GRAVEL.	***S1 – 0.3 m / 9%***
0.45 – 2.4	Grey, very dense, silty SAND and GRAVEL (till-like).	***S2 – 0.9 m / 8%***
2.4	Base of test pit.	***S3 – 2.1 m / 5%***

Site Photo 2 – TP2

DRAWING 21.094-3

TEST PIT LOGS

February 25, 2021
Job 21.094

TP 3 – East of Existing Home

		Sample / Moisture Content
0.0 – 0.3	Topsoils and overburden material.	
0.3 – 2.4	Brown, dense, silty SAND and GRAVEL, some cobble and boulder sized materials.	***S1 – 0.9 m / 5%*** ***S2 – 2.1 m / 6%***
2.4	Base of test pit.	

Site Photo 3 – TP3

DRAWING 21.094-4

TEST PIT LOGS

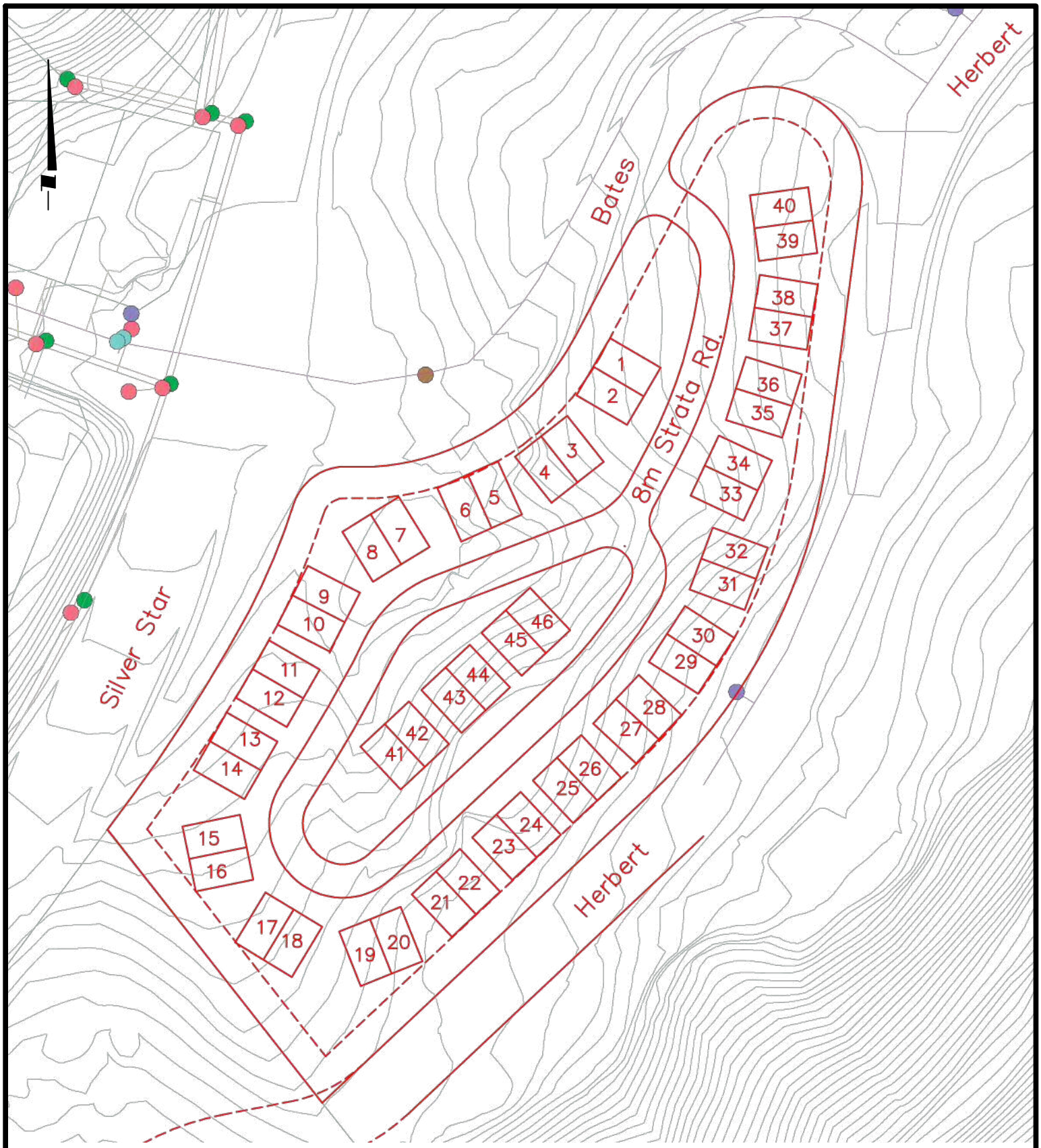
February 25, 2021
Job 21.094

TP 4 – North End

		Sample / Moisture Content
0.0 – 0.45	Topsoils and overburden material.	
0.45 – 2.4	Brown, compact to dense, SILT / fine SAND, trace to some gravel.	***S1 – 1.8 m / 12%***
2.4 – 3.0	Grey, dense, silty SAND and GRAVEL.	***S2 – 2.8 m / 10%***
3.0	Base of test pit.	

Site Photo 4 – TP4

DRAWING 21.094-5



NOTES

1. REFERENCE PLAN PROVIDED BY CLIENT.
2. FOR GETOECHNICAL COMMENTS AND RECOMMENDATIONS, PLEASE REFER TO PRELIMINARY GEOTECHNICAL REPORT DATED MARCH 2, 2021.

KOFOED CONTRACTING LTD PROPOSED SUBDIVISION 7025 HERBERT ROAD VERNON, BC	PRELIMINARY SUBDIVISION LAYOUT PLAN	INTERIOR TESTING SERVICES LTD 1-1965 MOSS COURT, KELOWNA, BC V1Y 9L3 PH: 250-860-6540 E-MAIL: INFO@INTERIORTESTING.COM DATE OF INVESTIGATION: FEBRUARY 25, 2021 JOB NUMBER: 21-094 DRAWING NUMBER: 21-094-6

TERMS OF ENGAGEMENT

GENERAL

Interior Testing Services Ltd. (ITSL) shall render the Services performed for the Client on this Project in accordance with the following Terms of Engagement. ITSL may, at its discretion and at any stage, engage subconsultants to perform all or any part of the Services. Unless specifically agreed in writing, these Terms of Engagement shall constitute the entire Contract between ITSL and the Client.

COMPENSATION

Charges for the Services rendered will be made in accordance with ITSL's Schedule of Fees and Disbursements in effect from time to time as the Services are rendered. All Charges will be payable in Canadian Dollars. Invoices will be due and payable by the Client within thirty (30) days of the date of the invoice without hold back. Interest on overdue accounts is 12% per annum.

REPRESENTATIVES

Each party shall designate a representative who is authorized to act on behalf of that party and receive notices under this Agreement.

TERMINATION

Either party may terminate this engagement without cause upon thirty (30) days' notice in writing. On termination by either party under this paragraph, the Client shall forthwith pay ITSL its Charges for the Services performed, including all expenses and other charges incurred by ITSL for this Project.

If either party breaches this engagement, the non-defaulting party may terminate this engagement after giving seven (7) days' notice to remedy the breach. On termination by ITSL under this paragraph, the Client shall forthwith pay to ITSL its Charges for the Services performed to the date of termination, including all fees and charges for this Project.

ENVIRONMENTAL

ITSL's field investigation, laboratory testing and engineering recommendations will not address or evaluate pollution of soil or pollution of groundwater. ITSL will co-operate with the Client's environmental consultant during the field work phase of the investigation.

PROFESSIONAL RESPONSIBILITY

In performing the Services, ITSL will provide and exercise the standard of care, skill and diligence required by customarily accepted professional practices and procedures normally provided in the performance of the Services contemplated in this engagement at the time when and the location in which the Services were performed. ITSL makes no warranty, representation or guarantee, either express or implied as to the professional services rendered under this agreement.

LIMITATION OF LIABILITY

ITSL shall not be responsible for:

(a) the failure of a contractor, retained by the Client, to perform the work required in the Project in accordance with the applicable contract documents;
(b) the design of or defects in equipment supplied or provided by the Client for incorporation into the Project;
(c) any cross-contamination resulting from subsurface investigations;
(d) any damage to subsurface structures and utilities;
(e) any Project decisions made by the Client if the decisions were made without the advice of ITSL or contrary to or inconsistent with ITSL's advice;
(f) any consequential loss, injury or damages suffered by the Client, including but not limited to loss of use, earnings and business interruption;
(g) the unauthorized distribution of any confidential document or report prepared by or on behalf of ITSL for the exclusive use of the Client.

The total amount of all claims the Client may have against ITSL under this engagement, including but not limited to claims for negligence, negligent misrepresentation and breach of contract, shall be strictly limited to the lesser of our fees or $50,000.00.

No claim may be brought against ITSL in contract or tort more than two (2) years after the Services were completed or terminated under this engagement.

PERSONAL LIABILITY
For the purposes of the limitation of liability provisions contained in the Agreement of the parties herein, the Client expressly agrees that it has entered into this Agreement with ITSL, both on its own behalf and as agent on behalf of its employees and principals.

The Client expressly agrees that ITSL's employees and principals shall have no personal liability to the Client in respect of a claim, whether in contract, tort and/or any other cause of action in law. Accordingly, the Client expressly agrees that it will bring no proceedings and take no action in any court of law against any of ITSL's employees or principals in their personal capacity.

THIRD PARTY LIABILITY
This report was prepared by ITSL for the account of the Client. The material in it reflects the judgement and opinion of ITSL in light of the information available to it at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. ITSL accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report. This report may not be used or relied upon by any other person unless that person is specifically named by us as a beneficiary of the Report. The Client agrees to maintain the confidentiality of the Report and reasonably protect the report from distribution to any other person.

INDEMNITY
The client shall indemnify and hold harmless ITSL from and against any costs, damages, expenses, legal fees and disbursements, expert and investigation costs, claims, liabilities, actions, causes of action and any taxes thereon arising from or related to any claim or threatened claim by any party arising from or related to the performance of the Services.

DOCUMENTS
All of the documents prepared by ITSL or on behalf of ITSL in connection with the Project are instruments of service for the execution of the Project. ITSL retains the property and copyright in these documents, whether the Project is executed or not. These documents may not be used on any other project without the prior written agreement of ITSL.

FIELD SERVICES
Where applicable, field services recommended for the Project are the minimum necessary, in the sole discretion of ITSL, to observe whether the work of a contractor retained by the Client is being carried out in general conformity with the intent of the Services.

DISPUTE RESOLUTION
If requested in writing by either the Client or ITSL, the Client and ITSL shall attempt to resolve any dispute between them arising out of or in connection with this Agreement by entering into structured non-binding negotiations with the assistance of a mediator on a without prejudice basis. The mediator shall be appointed by agreement of the parties. If a dispute cannot be settled within a period of thirty (30) calendar days with the mediator, the dispute shall be referred to and finally resolved by an arbitrator appointed by agreement of the parties.

CONFIRMATION OF PROFESSIONAL LIABILITY INSURANCE
As required by by-laws of the Association of Professional Engineers and Geoscientists of British Columbia, it is required that our firm advises whether or not Professional Liability Insurance is held. It is also required that a space for you to acknowledge this information be provided.

Our professional liability insurance is not project specific for the project and should not be regarded as such. If you require insurance for your project you should purchase a project specific insurance policy directly.

Accordingly, this notice serves to advise you that ITSL carries professional liability insurance. Please sign and return a copy of this form as an indication of acceptance and agreement to the contractual force of these Terms of Engagement.

ACKNOWLEDGEMENT:_____

THE CORPORATION OF THE CITY OF VERNON

ENGINEERING DEVELOPMENT SERVICING REPORT

FILE: **OCP00088 | ZON00369**

DATE: 15/09/2021

Attachment 7

LEGAL: LT 3 PL 29910 SEC 18 TWP 5 ODYD

LOCATION: 7025 HERBERT RD

SUBJECT: **OCP amendment from CR NORD to HRES; Rezoning from CR NORD to HR2 to facilitate the future development of duplexes and row housing**

Engineering Requirements

With regards to the rezoning application, Engineering Development Services will require that:

A traffic impact study be completed by the applicant to assess the impact of the proposed development on the intersection of Silver star road, Phoenix Drive and Bates Road. All recommendations from the traffic impact study must be incorporated into the design.

Non-conforming off-site works and servicing not installed as a condition of the current rezoning application must be installed to the bylaw standards at the time of any future application for development of this lot.

Future Development Requirements

Any and all future development of the lot will be subject to the requirements of City of Vernon Subdivision and Development Servicing Bylaw #3843, Greater Vernon Water Subdivision and Development Servicing Bylaw No. 2650, and all other applicable City and RDNO bylaws. Requirements may include professional reports/studies, offsite infrastructure improvements, road dedication, etc. It is highly recommended that the applicant review all applicable bylaws prior to conducting preliminary work or submitting an application.

For the purposes of reviewing basic bylaw requirements:

- The fronting street, Silver Star Road is classified as an Arterial Road in the Master Transportation Plan.
- The subject property is in Development District 3 as defined by the Official Community Plan (OCP).
- Bates Road and Herbert Road are not in the Vernon City boundary. They reside in the RDNO boundary.

Signed: _____
Jeff Reeves, Municipal Technician

Endorsed: _____
Brian Derrick, Manager Engineering Development Services`

ALIGN ENGINEERING
197 Merlin Court | Kelowna, BC V1V 1N2
T 250-870-3865
E TomB@AlignEng.ca
aligneng.ca

Memorandum

Attention:	**Merlin Kofoed**	**File No.:**	**A22-051**
Organization:	Kofoed Contracting Ltd	**Project:**	7025 Herbert Rd TIA
Phone:		**Date:**	March 21, 2023
Email:	merlin@kofoedgroup.com	**Revision:**	2
cc:			

RE: 7025 Herbert Rd Traffic Impact Assessment

1 Introduction

Align Engineering Ltd. (ALIGN) was retained by Kofoed Contracting Ltd to develop a traffic impact assessment (TIA) for the proposed 7025 Herbert Road development Vernon, BC. The following memorandum provides the TIA. The Terms of Reference for the study are provided in **APPENDIX A**.

The proposed development would rezone the property from CR (Country Residential) to the R5 (four-plex residential) zone to provide 57 single-family attached units (13 duplexes, one [1] triplex, and seven [7] fourplexes). The site plan is attached in **APPENDIX B**. Adjacent lots to the south are currently zoned R5.

2 Existing Conditions

The proposed study site location is shown in **FIGURE 1**. The land parcel is located within the City of Vernon and borders the North Okanagan Regional District (NORD) lands. The site is accessed from Bates Road via Silver Star Road. Silver Star Road is classified as an arterial road and is in the jurisdiction of the City of Vernon. Adjacent to the development, Silver Star Road has one southbound (downhill) lane, two northbound (climbing and fast lane), bicycle accessible shoulders, and a multi-use pathway on the west side south of Phoenix Drive. The northbound climbing lane ends prior to the intersection with Bates Road / Phoenix Drive. Silver Star Road has a posted speed of 60 km/h. Bates Road and Herbert Road are local roads within the NORD and are under the jurisdiction of the Ministry of Transportation and Infrastructure. These local roads have posted speeds of 50 km/h.

Winter traffic counts were collected at the intersection of Silver Star Road & Bates Road Phoenix Drive to capture higher volume activities associated with the SilverStar Mountain Resort. These volumes are shown in **FIGURE 2** and were collected on:

- Saturday January 28, 2023, between 9:00 AM to 11:00 AM and 3:00 PM to 5:00 PM.
- Tuesday January 31, 2023, between 7:00 AM to 9:00 AM and 3:30 PM to 5:30 PM.

Traffic volumes collected during the afternoon Saturday peak hour were approximately 60% higher than the other peak hours. Therefore, the analysis will review the peak Saturday PM in the winter when SilverStar Mountain Resort is operating. Collected traffic counts are provided in **APPENDIX C**.

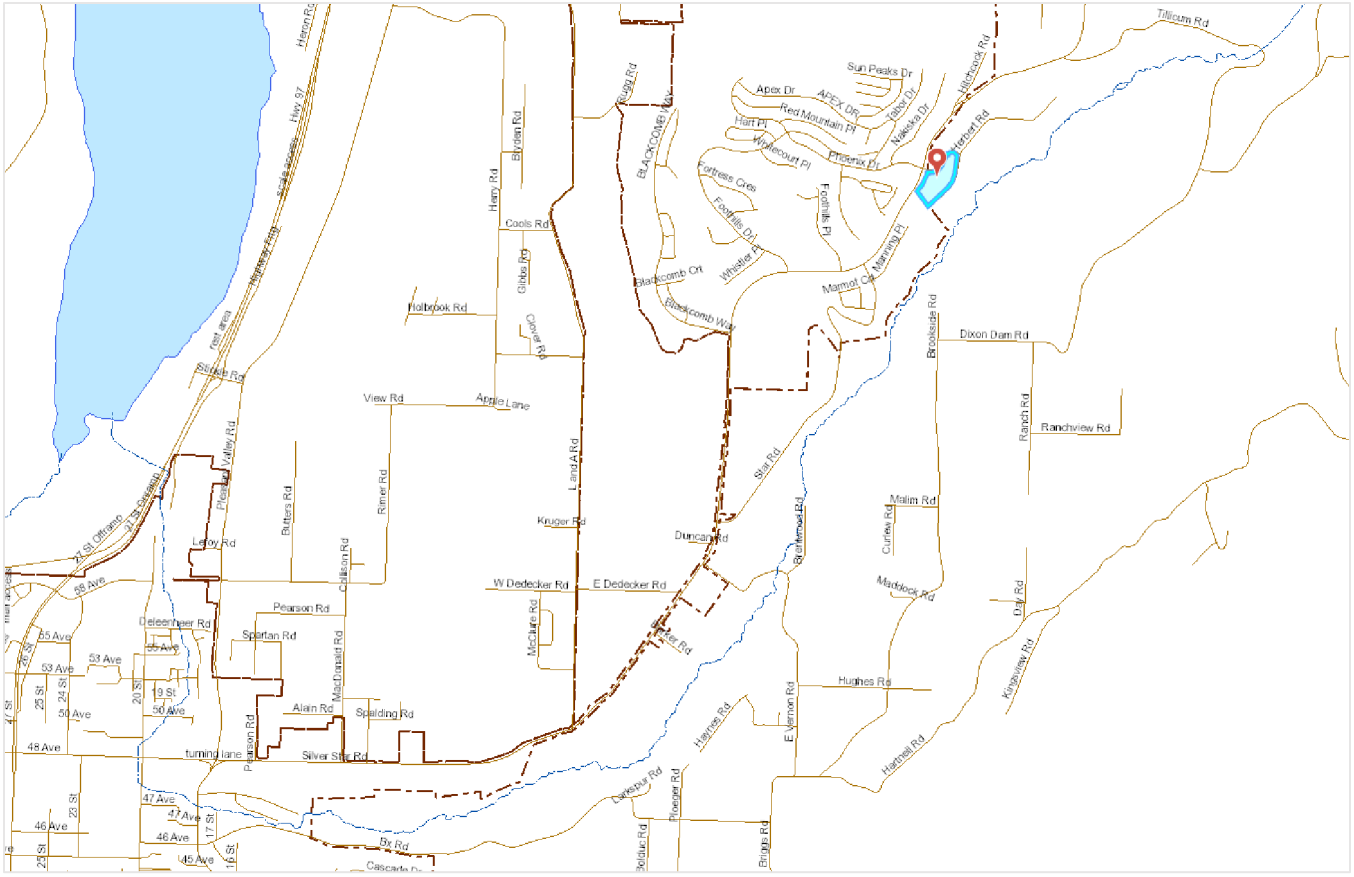


Figure 1: Proposed Development Site Location

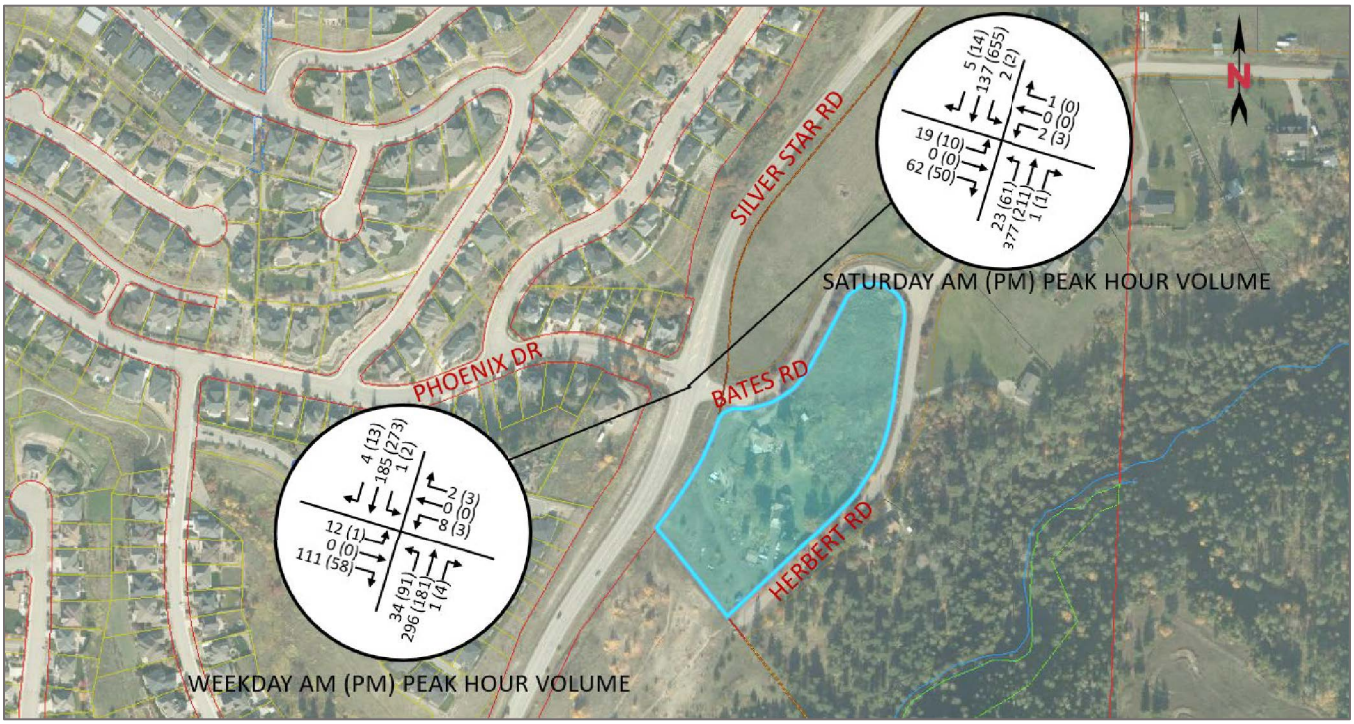


Figure 2: 2023 Existing Winter Weekday & Saturday AM & PM Peak Hour Volumes

2.1 Traffic Analysis

The traffic analysis was conducted with using a network intersection model with Synchro 11 and verified with microsimulation using SimTraffic. These provide with the following measures of effectiveness:

- **Volume-to-Capacity Ratio (v/c):** A measure of the volume of traffic relative to the capacity that can be accommodated.
- **Delay:** A measure of additional time incurred to each vehicle due to traffic control in units of seconds per vehicle
- **95th Percentile Queue (Queue):** Length of vehicles queuing with a five-percent probability of being exceeded during the peak hour of analysis. Units of metres where the average vehicle length is 7.5 m from the front of the vehicle to the front of the next vehicle.
- **Level of Service (LOS):** A qualitative measure of the quality of traffic flow. LOS A refers to free flow (uninterrupted conditions) and breaks down at LOS E or F. The Highway Capacity Manual defines LOS for unsignalized and signalized intersections based on average vehicle delay as per the following:

LOS	Description	Unsignalized Intersection	Signalized Intersection
A	Free Flow	≤ 10 sec	≤ 10 sec
B	Reasonable Flow	10 – 15 sec	10 – 20 sec
C	Stable Flow	15 – 25 sec	20 – 35 sec
D	Approaching Unstable flow	25 – 35 sec	35 – 55 sec
E	Unstable Flow	35 – 50 sec	55 – 80 sec
F	Failing / Breakdown Flow	> 50 sec	> 80 sec

The criteria for analysis include:

- Unsignalized Intersections:
  - Individual movement level of service (LOS) is LOS D;
  - Individual movement v/c 0.90; and
  - 95th percentile vehicle queue lengths do not exceed the available storage length.

Exceeding these criteria would trigger the future planned roundabout at the intersection of Silver Star Rd & Phoenix Drive / Bates Road.

TABLE 1 summarizes existing traffic conditions for the Weekday and Saturday AM and PM peak hours. All peak hours operate at LOS A overall with LOS D on the side streets of Phoenix Drive and Bates Road in the Saturday PM peak hour. Traffic modeling results are provided in **APPENDIX D**.

Table 1: 2023 Existing Winter Traffic Conditions

	Phoenix Dr			Bates Rd			Silver Star Rd						TOTAL
	Eastbound			Westbound			Northbound			Southbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Weekday AM Peak Hour													
Vol	12	1	111	8	1	2	34	296	1	1	185	4	654
v/c	0.27			0.12			0.04	0.22		0			-
Delay	12			22			8	0		0			4
LOS	B			C			A	A		A			A
Queue (m)	8			3			1	0		0			-
Weekday PM Peak Hour													
Vol	1	1	58	3	1	3	91	181	4	2	273	13	629
v/c	0.12			0.06			0.08	0.13		0.01			-
Delay	12			15			8	0		0			3
LOS	B			C			A	A		A			A
Queue (m)	3			2			2	0		0			-
Saturday AM Peak Hour													
Vol	19	1	62	2	1	1	23	377	1	2	137	5	629
v/c	0.15			0.03			0.02	0.28		0			-
Delay	12			15			8	0		0			2
LOS	B			C			A	A		A			A
Queue (m)	4			1			1	0		0			-
Saturday PM Peak Hour													
Vol	10	1	50	3	1	1	61	211	1	2	655	14	1007
v/c	0.35			0.10			0.09	0.16		0.00			-
Delay	26			30			10	0		0			3
LOS	D			D			A	A		A			A
Queue (m)	11			3			2	0		0			-

Note: v/c – volume to capacity ration, delay – seconds of delay per vehicle, LOS – Level of Service, Queue – 95th percentile queue in metres.

3 Background Traffic

The Foothills Neighbourhood plan estimates 1,944 residential units in the undeveloped upper section. Since the plan was developed, approximately 143 units were developed (1801 units remaining). Of the remaining development, there is an estimated 177 units of row housing and the remaining as detached single-family. TABLE 2 provides a summary of estimated trips generated that could be developed by the remaining Foothills neighbourhood. This would include an estimated 1222 vehicle trips in the AM peak hour, 1682 vehicle trips in the PM peak hour, and 1595 vehicle trips in the Saturday peak hour. The Foothills Neighbourhood Plan was adopted by the City of Vernon in October 2013. Since then, 143 units were constructed and occupied averaging nearly 18 units per year. Assuming the Upper Foothills Neighbourhood continues to grow by 25 units per year. This would allocate the following additional units to Phoenix Drive:

- 125 vehicle cumulative units for 2028 five-year build-out and
- 375 vehicle cumulative unit for 2038 fifteen-year build-out.

To be conservative in this analysis, all of these trips were assigned the intersection of Silver Star Road & Phoenix Drive / Bates Road.

Table 2: Estimated Upper Foothills Remaining Development

Land Use		Mode	Units	Peak Period	Trips	Entering	Exiting
210	Single-Family Detached Housing	Vehicle	1624	AM	1137	296	841
				PM	1527	962	565
				Sat	1494	807	687
215	Single-Family Attached Housing	Vehicle	177	AM	85	26	59
				PM	101	58	43
				Sat	101	48	53
Total		Vehicle	1801	AM	1222	322	900
				PM	1628	1020	608
				Sat	1595	855	740
2028 Five-Year Foothills Upper Build-out		**Vehicle**	**125**	**AM**	**85**	**22**	**62**
				PM	**113**	**71**	**42**
				Sat	**111**	**59**	**51**
2038 Fifteen-Year Upper Foothills Build-out		**Vehicle**	**375**	**AM**	**254**	**67**	**187**
				PM	**339**	**212**	**127**
				Sat	**332**	**178**	**154**

Note: Rates for Weekday AM and PM peaks are for Adjacent Peak Hour Traffic Under General Urban / Suburban settings.
Rates for Saturday are for the Peak Hour Generator Traffic under General Urban / Suburban settings.

Background traffic on Silver Star Road is assumed at a linear growth rate of 1% per year with the Upper Foothills growth and contributing to the Silver Star Road traffic volume.

3.1 Trip Distribution

Trip distributions for analysis were derived from the collected traffic counts. The data indicates the following trip distributions:

- 85% of development traffic travelling to / from the south (Vernon city centre)
- 15% of development traffic travelling to / from the north (SilverStar)

3.2 2028 Background Traffic

TABLE 3 summarizes the background traffic conditions for 2028 show LOS F on Phoenix Drive and Bates Road. The SimTraffic simulation indicates lower delay for these movements, that would equate to LOS C-D.

Table 3: 2028 Background Traffic Conditions

	Phoenix Dr			Bates Rd			Silver Star Rd						TOTAL
	Eastbound			Westbound			Northbound			Southbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Saturday PM Peak Hour													
Vol	18	1	93	3	1	1	111	222	1	2	688	23	1161
v/c	0.70			0.17			0.16	0.17		0.00			-
Delay	51			52			10	0		0			7
LOS	F			F			B	A		A			A
Queue (m)	34			5			4	0		0			-
Sim Delay	12	28	10	15	17	2	6	0	1	-	1	0	3
Sim Queue	22			6			14	0		0			-

Note: v/c – volume to capacity ration, delay – seconds of delay per vehicle, LOS – Level of Service, Queue – 95th percentile queue in metres
Sim Delay – SimTraffic delay in seconds, Sim Queue – SimTraffic 95th percentile queue in metres

3.3 2038 Background Traffic

TABLE 4 summarizes the 2038 background traffic conditions. The Synchro analysis shows the Phoenix Road and Bates Road approaches with substantially higher delays and queues. SimTraffic indicates more moderate increases to delays and queues with delays in the order of LOS D.

Table 4: 2038 Background Traffic Conditions

	Phoenix Dr			Bates Rd			Silver Star Rd						TOTAL
	Eastbound			Westbound			Northbound			Southbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Saturday PM Peak Hour													
Vol	33	1	181	3	1	1	212	243	1	2	753	41	1469
v/c	1.25			0.42			0.28	0.15		0.00			-
Delay	190			158			11	0		0			34
LOS	F			F			B	A		A			A
Queue (m)	102			11			9	0		0			-
Sim Delay	29	-	19	31	20	4	10	0	0	0	2	1	6
Sim Queue	45			6			29	0		0			-

Note: v/c – volume to capacity ration, delay – seconds of delay per vehicle, LOS – Level of Service, Queue – 95th percentile queue in metres
Sim Delay – SimTraffic delay in seconds, Sim Queue – SimTraffic 95th percentile queue in metres

4 Post Development

4.1 Trip Generation

TABLE 5 summarizes the ITE Trip Generation 11th Edition weekday trip generation rates for vehicle trips.

Table 5: ITE Trip Generation Weekday Peak Hour Rates

Land Use		Trips	Peak Period	Trip Gen Rate	Entering	Exiting
210	Single-Family Detached Housing	Vehicle	AM	0.70	26%	74%
			PM	0.94	63%	37%
			Sat	0.92	54%	46%
215	Single-Family Attached Housing	Vehicle	AM	0.48	31%	69%
			PM	0.57	57%	43%
			Sat	0.57	48%	52%

Note: Rates for Weekday AM and PM peaks are for Adjacent Peak Hour Traffic Under General Urban / Suburban settings.
Rates for Saturday are for the Peak Hour Generator Traffic under General Urban / Suburban settings.

TABLE 6 shows a breakdown of the estimated vehicle trips for the proposed 7025 Herbert Road development. According to the ITE Trip Generation Manual, the proposed 57-unit single-family attached residential development would generate an estimated 27 vehicles per hour in the weekday AM, 32 vehicles per hour in the weekday PM, and 32 vehicles in the Saturday peak.

Table 6: ITE Trip Generation Weekday Peak Hour Volumes

Land Use		Mode	Units	Peak Period	Trips	Entering	Exiting
215	Single-Family Attached Housing	Vehicle	57	AM	27	8	19
				PM	32	18	14
				Sat	32	15	17

Note: Rates for Weekday AM and PM peaks are for Adjacent Peak Hour Traffic Under General Urban / Suburban settings.
Rates for Saturday are for the Peak Hour Generator Traffic under General Urban / Suburban settings.

4.2 2028 Post Development Traffic

The post development traffic conditions apply the development traffic to the background traffic. In the 2028 post development scenario, conditions worsen from the background traffic due to higher volumes on the Bates Road approach which include a higher portion of left-turn movements. **TABLE 7** shows the Saturday PM peak hour traffic volumes for 2028 with the proposed development. The westbound delay doubles and queue extends to three vehicles. The SimTraffic simulation indicates delays doubling for the westbound and 95th percentile queues equating to 6 vehicles on the eastbound left-turn with LOS F. This indicates that the intersection operations are sensitive to small increases in left-turn movements from Bates Road. Regular daily variation in these traffic volumes or other development in the RDNO accessing Bates Road during peak periods can significantly impact the level of service. This indicates that the Silver Star Road & Phoenix Drive / Bates Road roundabout should be in-service prior to 2028.

Table 7: 2028 Post Development Traffic Conditions

	Phoenix Dr			Bates Rd			Silver Star Rd						TOTAL
	Eastbound			Westbound			Northbound			Southbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Saturday PM Peak Hour													
Vol	18	1	93	17	1	3	111	222	14	4	688	23	1193
v/c	0.71			0.63			0.16	0.17		0.01			-
Delay	53			115			10	0		0			10
LOS	F			F			B	A		A			A
Queue (m)	35			21			4	0		0			-
Sim Delay	51	-	25	25	32	13	7	0	0	3	1	1	5
Sim Queue	44			11			14	0		3			-

Note: v/c – volume to capacity ration, delay – seconds of delay per vehicle, LOS – Level of Service, Queue – 95th percentile queue in metres
Sim Delay – SimTraffic delay in seconds, Sim Queue – SimTraffic 95th percentile queue in metres

4.3 2038 Post Development Traffic

Traffic conditions for the addition of the 7025 Herbert Road traffic to the Silver Star Road & Phoenix Drive / Bates Road intersection are summarized in TABLE 8. Traffic conditions breakdown further with the additional traffic on Bates Road increasing queues on Phoenix Drive due to the sensitivity of the intersection to accommodate more traffic on Bates Road.

Table 8: 2038 Post Development Traffic Conditions

	Phoenix Dr			Bates Rd			Silver Star Rd						TOTAL
	Eastbound			Westbound			Northbound			Southbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Saturday PM Peak Hour													
Vol	33	1	181	17	1	3	212	243	14	4	753	41	1501
v/c	1.28			2.27			0.28	0.18		0.01			-
Delay	203			895			11	0		0			64
LOS	F			F			B	A		A			F
Queue (m)	105			55			9	0		0			-
Sim Delay	120	-	93	65	53	-	11	1	0	3	2	1	18
Sim Queue	134			17			30	0		3			-

Note: v/c – volume to capacity ration, delay – seconds of delay per vehicle, LOS – Level of Service, Queue – 95th percentile queue in metres
Sim Delay – SimTraffic delay in seconds, Sim Queue – SimTraffic 95th percentile queue in metres

5 Active Modes & Transit

There is an existing asphalt multi-use pathway on the west side of Silver Star Road connecting to the southwest corner of the intersection with Phoenix Drive. The BX Trail runs east of the development connecting to the Grey Canal Trail and parallel to Silver Star Road. The development contemplates a joint connection with the adjacent property to the south (Manning Place) that could support a portion of a future link to the BX Trail. The development should continue this connection to the intersection of Silver Star Road & Bates Road. As the Upper Foothills and 7025 Herbert Road developments build-out, more pedestrian activity can be expected to cross Silver Star Road. While the existing volumes from the winter counts are low, these are anticipated to be higher in the spring, summer, and fall and can easily reach

15 equivalent adult units. Traffic volumes are in the order of 10,000 vehicles per day and the posted speed limit is 60 km/h. According to the TAC Pedestrian Crossing Control Guide, a marked crosswalk with rectangular rapid flashing beacons (RRFBs) should be applied. This crosswalk should be located on the south side of the intersection to tie-in to the Silver Star Road multi-use pathway. Implementation for crosswalk and pathway connections to Silver Star Road should be shared by the 7025 Herbert Road and adjacent Manning Place developments.

Future transit service is anticipated to a neighbourhood centre site south of Bates Road. Connections to 7025 Herbert Road through to Manning Place would provide access for residences on Herbert Road.

6 Access

The site plan in **FIGURE 3** shows the access to Bates Road. This location would be placed adjacent to a 7% road grade, on the inside of a horizontal curve, approximately 60 m from the Bates Road & Herbert Road intersection, and obstructed by adjacent foliage (see **FIGURE 4**). To manage the access, foliage on the inside of the curve should be no higher than 0.3m and no fencing along the property line should obstruct sightlines to the access from Bates Road. Alternatively, the main access could shift to Herbert Road.

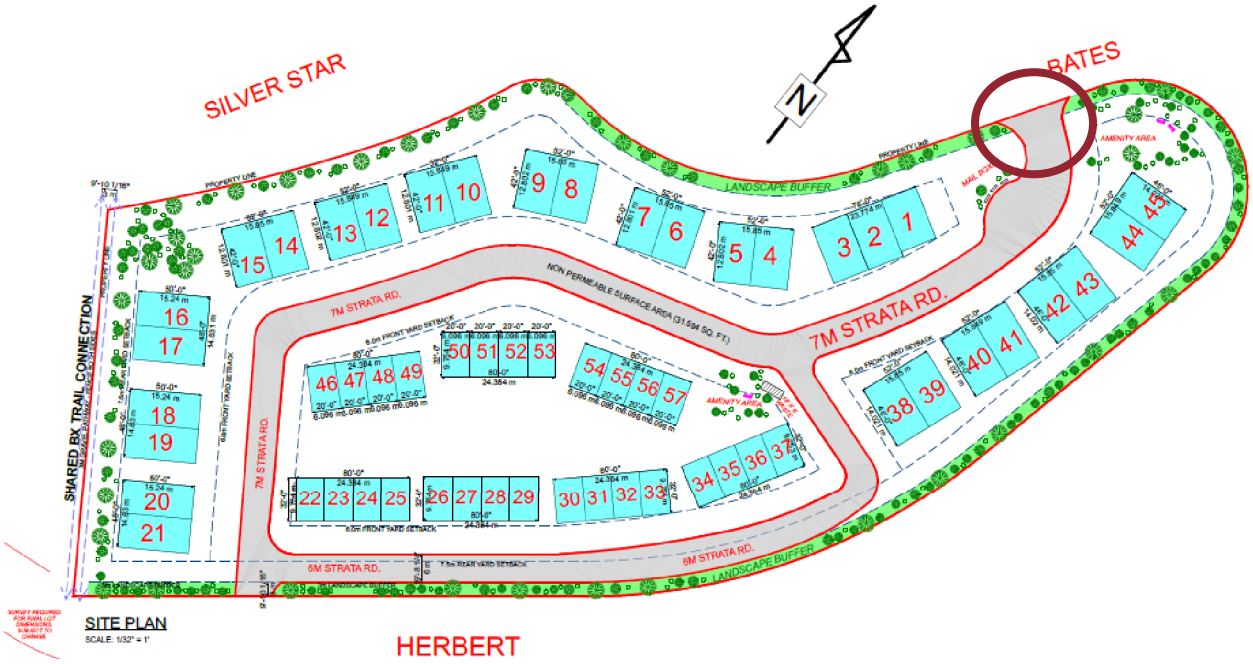


Figure 3: 7025 Herbert Rd Site Plan & Access to Bates Rd

Figure 4: Proposed Access Location

7 Road Safety

According to ICBC collision data, there were three (3) collisions at Silver Star Road & Phoenix Drive / Bates Road between 2017 and 2021. Two of these occurred in 2017 and one in 2020. Two of the collisions were casualty collisions and one was a property-damage-only collision. None of the collisions involved vulnerable road users. The addition of a roundabout at the intersection is expected to reduce risk of injury collisions, but may experience more property damage only collisions in the form of rear-end collisions. This is considered a safer treatment to the existing condition as it would lower speeds entering and exiting the intersection, lower severity collisions, and improve visibility to existing and future vulnerable road users.

8 Summary & Recommendations

The proposed 7025 Herbert Road development would rezone the property from CR (Country Residential) to the R5 (four-plex residential) zone to provide 57 single-family attached units (13 duplexes, one [1] triplex, and seven [7] fourplexes). The development proposes a shared pathway connection between the Manning Place property to the south and along the east side of Silver Star Road to Bates Road. In addition, an RRFB crosswalk should be implemented with the development that would work with the future roundabout.

It is recommended that the City:

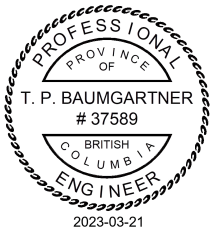
- Construct the roundabout at Silver Star Road & Phoenix Drive / Bates Road prior to 2028 to safely accommodate future Upper Foothills and 7025 Herbert Road traffic.
- Coordinate shared implementation with the neighbouring Manning Place property for the pedestrian pathway right-of-way, and intersection crosswalk improvements.

Please contact me at 250-870-3865 if there are any questions or comments. Thank you.

Sincerely,

Align Engineering Ltd

Authored by:



Tom Baumgartner, MSc, P.Eng., RSP1

Senior Transportation Engineer | Principal

Permit to Practice Number: 1000340

Reviewed by:

Elisabeth Hofbauer-Spitzer, MSc, P.Eng.

Senior Transportation Engineer

Appendix A: Terms of Reference

197 Merlin Court | Kelowna, BC V1V 1N2
T 250-870-3865
E TomB@AlignEng.ca
aligneng.ca

Memorandum

Attention:	**Merlin Kofoed**	**File No.:**	**A22-051**
Organization:	Kofoed Contracting Ltd	**Project:**	7025 Herbert Rd TIA
Phone:		**Date:**	February 14, 2023
Email:	merlin@kofoedgroup.com	**Revision:**	2
cc:			

RE: 7025 Herbert Rd Terms of Reference

1 Introduction

Align Engineering Ltd. (ALIGN) was retained by Kofoed Contracting Ltd to develop a traffic impact assessment (TIA) for the proposed 7025 Herbert Road TIA in Vernon, BC. The following memorandum provides the terms of reference (ToR) for the TIA.

The proposed development would rezone the property from CR (Country Residential) to the R5 (four-plex residential) zone to provide 57 single-family attached units (13 duplexes, one [1] triplex, and seven [7] fourplexes). A site plan is attached in **APPENDIX A**. Adjacent lots to the south are currently zoned R5.

2 Study Scope

The proposed study site location is shown in **FIGURE 1**. The land parcel is located within the City of Vernon and borders the North Okanagan Regional District (NORD) lands. The site is accessed from Bates Road via Silver Star Road. Silver Star Road is classified as an arterial road and is in the jurisdiction of the City of Vernon. Adjacent to the development, Silver Star Road has one southbound (downhill) lane, two northbound (climbing and fast lane), and bicycle accessible shoulders. The northbound climbing lane ends prior to the intersection with Bates Road / Phoenix Drive. Silver Star Road has a posted speed of 60 km/h. Bates Road and Herbert Road are local roads within the NORD and are under the jurisdiction of the Ministry of Transportation and Infrastructure. These local roads have posted speeds of 50 km/h.

Traffic counts were collected at the intersection of Silver Star Road & Bates Road Phoenix Drive on:

- Saturday January 28, 2023:
  - 9:00 AM to 11:00 AM and
  - 3:00 PM to 5:00 PM.
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  - 7:00 AM to 9:00 AM and
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Traffic volumes collected during the afternoon Saturday peak hour were approximately 60% higher than the other peak hour. Therefore, the analysis will review the peak Saturday PM in the winter when SilverStar Mountain Resort is operating.

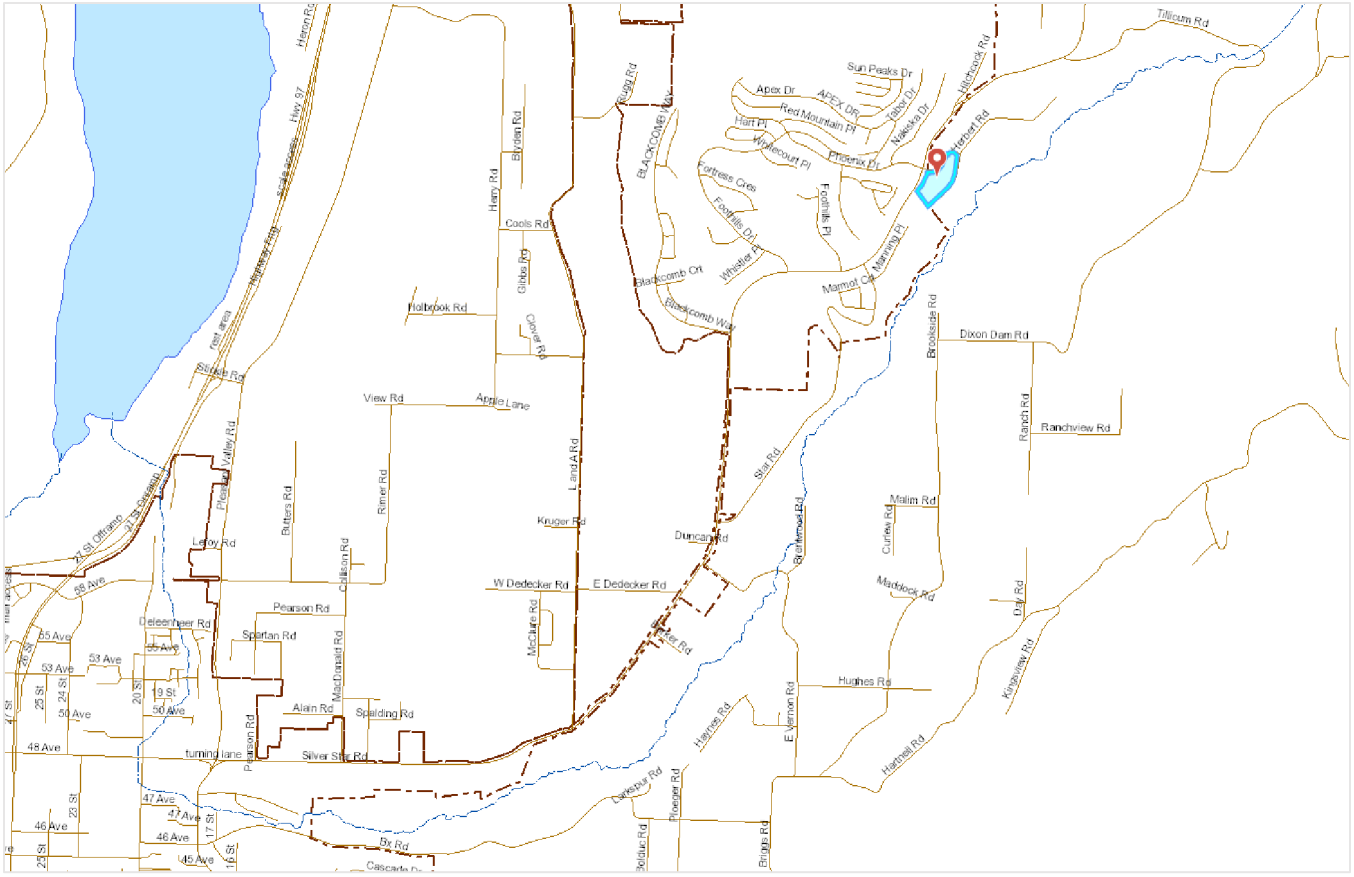

Figure 1: Proposed Development Site Location

2.1 Trip Generation

TABLE 1 summarizes the ITE Trip Generation 11th Edition weekday trip generation rates for vehicle trips.

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				Sat	32	15	17

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				PM	101	58	43
				Sat	101	48	53
Total		**Vehicle**	**1801**	**AM**	**1222**	**322**	**900**
				PM	**1628**	**1020**	**608**
				Sat	**1595**	**855**	**740**

Note: Rates for Weekday AM and PM peaks are for Adjacent Peak Hour Traffic Under General Urban / Suburban settings.
Rates for Saturday are for the Peak Hour Generator Traffic under General Urban / Suburban settings.

2.2 Trip Distribution

Trip distributions for analysis were derived from the collected traffic counts. The data indicates the following during the Saturday peak analysis period:

- 85% of development traffic travelling to / from the south (Vernon city centre)
- 15% of development traffic travelling to / from the north (SilverStar)

2.3 Active Modes & Transit

The study will assess active transportation. This will include warrants for a safe pedestrian crossing of Silver Star Road to connect to the multi-use pathway on the west side of Silver Star Road and the BX Trail on the east. There is no current transit service to the area but is noted as part of the future transit network in the Master Transportation Plan.

2.4 Access

The study will assess safe access to the adjacent road network from an assessment of sightlines and traffic operations at the access points and the Silver Star Road & Bates Road / Phoenix Drive intersection. Site observations and ICBC collision maps will be reviewed to assess safety performance.

2.5 2.6 Reporting

The study will provide recommendations on required engineering measures to mitigate impacts and integrate into the transportation network. The findings of the study will be summarized in a technical memorandum.

Please contact me at 250-870-3865 if there are any questions or comments. Thank you.

Sincerely,
Align Engineering Ltd

Tom Baumgartner, MSc, P.Eng., RSP1
Senior Transportation Engineer | Principal

Appendix B: Conceptual Site Plan

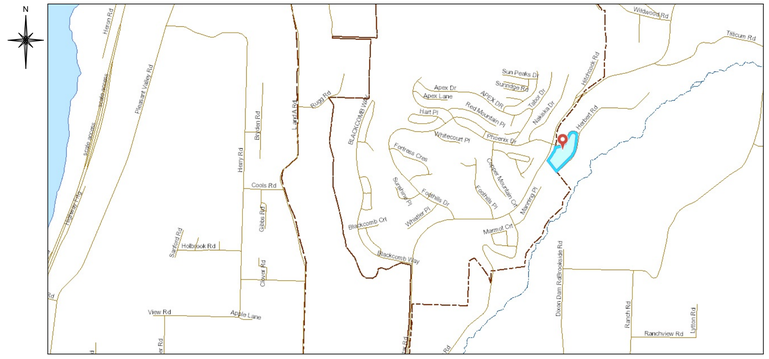
KOFOED GROUP

PROJECT INFO:

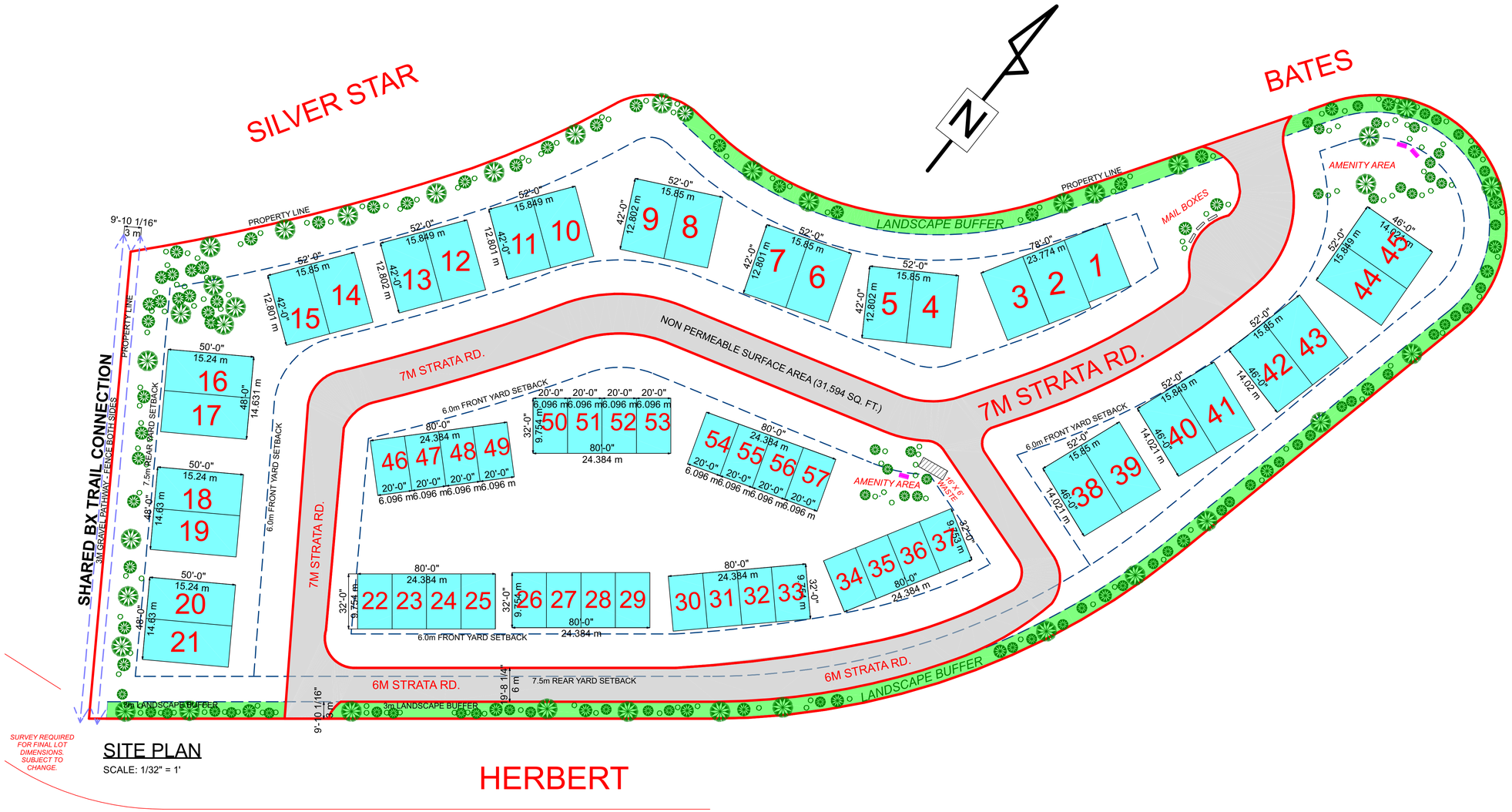
CIVIC ADDRESS:
7025 HERBERT RD.

Legal Description:
PID: 004-119-665
Plan: 29910
Lot: 3

TOTAL PROPERTY AREA	20,139.97	SQ. M.	(216,781.6 SQ. FT.)
SITE COVERAGE			
BUILDING FOOTPRINTS	23.5%		(51,068 SQ. FT.)
STRATA ROAD	14.5%		(31,594 SQ. FT.)
TOTAL SITE COVERAGE INCLUDING NON-PERMEABLE SURFACES	38.1%		(82,662 SQ. FT.)



SOURCE: NORTH OKANAGAN MAP(GIS)



SITE PLAN
SCALE: 1/32" = 1'

ZIOLA DESIGN

URBAN OPTIONS Planning Corp.

KOFOED GROUP

HERBERT ROAD
VERNON BC

PROJECT TITLE

TITLE	
SCALE	
DATE	JUL-21-2022
PROJECT NUMBER	Z-138-02
DRAWING NUMBER	1.9
SHEET	1 OF 1

Appendix C: Traffic Counts

ALIGN ENGINEERING

Intersection Turning Movement Count Report

N/S Street	Silver Star Rd	Counter	Evan Geck	Date	Saturday January 28, 2023
E/W Street	Bates Rd / Phoenix Dr			Weather	Sunny
Location	Vernon, BC	Peak Hr	9:00 AM to 10:00 AM	Job#	A22-051

All Vehicles

Interval		Eastbound			Westbound			Northbound			Southbound			Total	Hourly	Pedestrian Crossings			
Start	End	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Volume	Volume	N	S	W	E
9:00 AM	9:15 AM	5	0	14	1	0	0	6	88	0	0	41	0	155		0	0	0	0
9:15 AM	9:30 AM	5	0	16	0	0	1	5	117	1	1	35	1	182		0	0	0	0
9:30 AM	9:45 AM	5	0	14	0	0	0	8	85	0	0	31	0	143		0	0	0	0
9:45 AM	10:00 AM	4	0	18	1	0	0	4	87	0	1	30	4	149	629	0	0	0	0
10:00 AM	10:15 AM	4	0	13	0	0	1	3	76	2	1	50	1	151	625	0	0	0	0
10:15 AM	10:30 AM	5	1	12	4	0	0	12	63	1	0	31	4	133	576	0	2	3	0
10:30 AM	10:45 AM	5	0	14	0	0	0	12	78	0	0	46	3	158	591	0	0	1	0
10:45 AM	11:00 AM	2	0	15	0	0	1	8	70	0	0	72	4	172	614	0	0	0	0
TOTAL		**35**	**1**	**116**	**6**	**0**	**3**	**58**	**664**	**4**	**3**	**336**	**17**			**0**	**2**	**4**	**0**
Peak Hr Vol		**19**	**0**	**62**	**2**	**0**	**1**	**23**	**377**	**1**	**2**	**137**	**5**			**0**	**0**	**0**	**0**
Peak Hr Factor		***0.95***		***0.86***	***0.50***		***0.25***	***0.72***	***0.81***	***0.25***	***0.50***	***0.84***	***0.31***						

Passenger Vehicles

Interval		Eastbound			Westbound			Northbound			Southbound		
Start	End	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
9:00 AM	9:15 AM	5	0	14	1	0	0	6	87	0	0	39	0
9:15 AM	9:30 AM	5	0	16	0	0	1	5	117	1	1	35	1
9:30 AM	9:45 AM	5	0	14	0	0	0	8	85	0	0	31	0
9:45 AM	10:00 AM	4	0	18	1	0	0	4	87	0	1	30	4
10:00 AM	10:15 AM	4	0	13	0	0	1	3	76	2	1	48	1
10:15 AM	10:30 AM	5	1	12	4	0	0	12	62	1	0	31	4
10:30 AM	10:45 AM	5	0	14	0	0	0	12	78	0	0	45	3
10:45 AM	11:00 AM	2	0	15	0	0	1	8	70	0	0	71	4
TOTAL		**35**	**1**	**116**	**6**	**0**	**3**	**58**	**662**	**4**	**3**	**330**	**17**
Peak Hr Vol		**19**	**0**	**62**	**2**	**0**	**1**	**23**	**376**	**1**	**2**	**135**	**5**

Heavy Vehicles

Interval		Eastbound			Westbound			Northbound			Southbound		
Start	End	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
9:00 AM	9:15 AM	0	0	0	0	0	0	0	1	0	0	2	0
9:15 AM	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	10:15 AM	0	0	0	0	0	0	0	0	0	0	2	0
10:15 AM	10:30 AM	0	0	0	0	0	0	0	1	0	0	0	0
10:30 AM	10:45 AM	0	0	0	0	0	0	0	0	0	0	1	0
10:45 AM	11:00 AM	0	0	0	0	0	0	0	0	0	0	1	0
TOTAL		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**6**	**0**
Peak Hr Vol		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**2**	**0**
% Heavy Vehicle		**0%**		**0%**	**0%**		**0%**	**0%**	**0%**	**0%**	**0%**	**1%**	**0%**

Bicycles

Interval		Eastbound			Westbound			Northbound			Southbound		
Start	End	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
9:00 AM	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Peak Hr Vol		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

ALIGN ENGINEERING

Intersection Turning Movement Count Report

N/S Street	Silver Star Rd	Counter	Evan Geck			Date	Saturday January 28, 2023
E/W Street	Bates Rd / Phoenix Dr					Weather	Sunny
Location	Vernon, BC	Peak Hr	3:15 PM	to	4:15 PM	Job#	A22-051

All Vehicles

Interval		Eastbound			Westbound			Northbound			Southbound			Total	Hourly	Pedestrian Crossings			
Start	End	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Volume	Volume	N	S	W	E
3:00 PM	3:15 PM	2	0	11	0	1	0	14	73	0	0	95	1	197		0	0	2	0
3:15 PM	3:30 PM	4	0	11	2	0	0	9	66	0	1	133	7	233		0	0	0	0
3:30 PM	3:45 PM	6	0	16	1	0	0	18	56	0	1	191	1	290		0	0	0	0
3:45 PM	4:00 PM	0	0	13	0	0	0	16	47	1	0	188	6	271	991	0	0	0	0
4:00 PM	4:15 PM	0	0	10	0	0	0	18	42	0	0	143	0	213	1007	0	0	0	0
4:15 PM	4:30 PM	1	1	11	1	0	0	19	46	1	2	116	3	201	975	0	0	0	0
4:30 PM	4:45 PM	0	1	10	1	0	0	15	40	0	0	82	6	155	840	0	0	0	0
4:45 PM	5:00 PM	0	0	11	1	0	0	18	39	0	2	57	4	132	701	0	0	0	0
TOTAL		**13**	**2**	**93**	**6**	**1**	**0**	**127**	**409**	**2**	**6**	**1005**	**28**			**0**	**0**	**2**	**0**
Peak Hr Vol		**10**	**0**	**50**	**3**	**0**	**0**	**61**	**211**	**1**	**2**	**655**	**14**			**0**	**0**	**0**	**0**
Peak Hr Factor		***0.42***		***0.78***	***0.38***			***0.85***	***0.80***	***0.25***	***0.50***	***0.86***	***0.50***						

Passenger Vehicles

Interval		Eastbound			Westbound			Northbound			Southbound		
Start	End	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
3:00 PM	3:15 PM	2	0	11	0	1	0	14	73	0	0	95	1
3:15 PM	3:30 PM	4	0	11	2	0	0	9	64	0	1	132	7
3:30 PM	3:45 PM	6	0	16	1	0	0	18	56	0	1	191	1
3:45 PM	4:00 PM	0	0	13	0	0	0	16	46	1	0	188	6
4:00 PM	4:15 PM	0	0	10	0	0	0	18	42	0	0	143	0
4:15 PM	4:30 PM	0	1	11	1	0	0	19	45	1	2	111	3
4:30 PM	4:45 PM	0	1	10	1	0	0	15	40	0	0	82	6
4:45 PM	5:00 PM	0	0	11	1	0	0	18	38	0	1	55	4
TOTAL		**12**	**2**	**93**	**6**	**1**	**0**	**127**	**404**	**2**	**5**	**997**	**28**
Peak Hr Vol		**10**	**0**	**50**	**3**	**0**	**0**	**61**	**208**	**1**	**2**	**654**	**14**

Heavy Vehicles

Interval		Eastbound			Westbound			Northbound			Southbound		
Start	End	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
3:00 PM	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	3:30 PM	0	0	0	0	0	0	0	2	0	0	1	0
3:30 PM	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	4:00 PM	0	0	0	0	0	0	0	1	0	0	0	0
4:00 PM	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	4:30 PM	1	0	0	0	0	0	0	1	0	0	5	0
4:30 PM	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	5:00 PM	0	0	0	0	0	0	0	1	0	1	2	0
TOTAL		**1**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**0**	**1**	**8**	**0**
Peak Hr Vol		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**1**	**0**
% Heavy Vehicle		**0%**		**0%**	**0%**			**0%**	**1%**	**0%**	**0%**	**0%**	**0%**

Bicycles

Interval		Eastbound			Westbound			Northbound			Southbound		
Start	End	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
3:00 PM	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Peak Hr Vol		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

ALIGN ENGINEERING

Intersection Turning Movement Count Report

N/S Street	Silver Star Rd	Counter	Evan Geck	Date	Tuesday January 31, 2023
E/W Street	Bates Rd / Phoenix Dr			Weather	Cloudy, Light Snow
Location	Vernon, BC	Peak Hr	7:45 AM to 8:45 AM	Job#	A22-051

All Vehicles

Interval		Eastbound			Westbound			Northbound			Southbound			Total	Hourly	Pedestrian Crossings			
Start	End	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Volume	Volume	N	S	W	E
7:00 AM	7:15 AM	1	0	12	0	0	0	5	27	0	0	17	0	62		0	0	0	0
7:15 AM	7:30 AM	1	0	21	2	0	0	5	34	0	0	20	0	83		0	0	0	0
7:30 AM	7:45 AM	1	0	27	1	0	0	6	56	0	1	51	2	145		0	0	0	0
7:45 AM	8:00 AM	3	0	35	1	0	1	3	58	0	0	45	0	146	436	0	0	0	0
8:00 AM	8:15 AM	5	0	40	5	0	0	9	61	0	1	58	1	180	554	0	0	0	0
8:15 AM	8:30 AM	1	0	21	0	0	1	9	83	1	0	45	2	163	634	0	0	0	0
8:30 AM	8:45 AM	3	0	15	2	0	0	13	94	0	0	37	1	165	654	0	0	0	0
8:45 AM	9:00 AM	1	0	22	0	0	2	14	69	1	0	32	1	142	650	0	0	0	0
TOTAL		**16**	**0**	**193**	**11**	**0**	**4**	**64**	**482**	**2**	**2**	**305**	**7**			**0**	**0**	**0**	**0**
Peak Hr Vol		**12**	**0**	**111**	**8**	**0**	**2**	**34**	**296**	**1**	**1**	**185**	**4**			**0**	**0**	**0**	**0**
Peak Hr Factor		***0.60***		***0.69***	***0.40***		***0.50***	***0.65***	***0.79***	***0.25***	***0.25***	***0.80***	***0.50***						

Passenger Vehicles

Interval		Eastbound			Westbound			Northbound			Southbound		
Start	End	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
7:00 AM	7:15 AM	1	0	12	0	0	0	5	25	0	0	17	0
7:15 AM	7:30 AM	1	0	21	2	0	0	5	32	0	0	19	0
7:30 AM	7:45 AM	1	0	27	1	0	0	5	54	0	0	50	2
7:45 AM	8:00 AM	3	0	35	1	0	0	2	58	0	0	45	0
8:00 AM	8:15 AM	4	0	40	5	0	0	8	61	0	0	56	1
8:15 AM	8:30 AM	1	0	21	0	0	1	9	83	1	0	45	2
8:30 AM	8:45 AM	3	0	15	2	0	0	13	91	0	0	36	1
8:45 AM	9:00 AM	1	0	21	0	0	2	14	69	1	0	31	1
TOTAL		**15**	**0**	**192**	**11**	**0**	**3**	**61**	**473**	**2**	**0**	**299**	**7**
Peak Hr Vol		**11**	**0**	**111**	**8**	**0**	**1**	**32**	**293**	**1**	**0**	**182**	**4**

Heavy Vehicles

Interval		Eastbound			Westbound			Northbound			Southbound		
Start	End	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
7:00 AM	7:15 AM	0	0	0	0	0	0	0	2	0	0	0	0
7:15 AM	7:30 AM	0	0	0	0	0	0	0	2	0	0	1	0
7:30 AM	7:45 AM	0	0	0	0	0	0	1	2	0	1	1	0
7:45 AM	8:00 AM	0	0	0	0	0	1	1	0	0	0	0	0
8:00 AM	8:15 AM	1	0	0	0	0	0	1	0	0	1	2	0
8:15 AM	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	8:45 AM	0	0	0	0	0	0	0	3	0	0	1	0
8:45 AM	9:00 AM	0	0	1	0	0	0	0	0	0	0	1	0
TOTAL		**1**	**0**	**1**	**0**	**0**	**1**	**3**	**9**	**0**	**2**	**6**	**0**
Peak Hr Vol		**1**	**0**	**0**	**0**	**0**	**1**	**2**	**3**	**0**	**1**	**3**	**0**
% Heavy Vehicle		**9%**		**0%**	**0%**		**100%**	**6%**	**1%**	**0%**		**2%**	**0%**

Bicycles

Interval		Eastbound			Westbound			Northbound			Southbound		
Start	End	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
7:00 AM	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Peak Hr Vol		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

ALIGN ENGINEERING

Intersection Turning Movement Count Report

N/S Street	Silver Star Rd	Counter	Evan Geck			Date	Tuesday January 31, 2023
E/W Street	Bates Rd / Phoenix Dr					Weather	Cloudy, Light Snow
Location	Vernon, BC	Peak Hr	3:30 PM	to	4:30 PM	Job#	A22-051

All Vehicles

Interval		Eastbound			Westbound			Northbound			Southbound			Total	Hourly	Pedestrian Crossings			
Start	End	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Volume	Volume	N	S	W	E
3:30 PM	3:45 PM	0	0	15	2	0	3	22	52	2	2	76	1	175		0	0	0	0
3:45 PM	4:00 PM	0	0	17	0	0	0	21	45	1	0	68	5	157		1	0	1	0
4:00 PM	4:15 PM	0	0	13	0	0	0	26	34	1	0	69	2	145		0	0	0	0
4:15 PM	4:30 PM	1	0	13	1	0	0	22	50	0	0	60	5	152	629	0	0	0	0
4:30 PM	4:45 PM	1	0	13	0	0	0	19	41	1	0	42	2	119	573	0	0	0	0
4:45 PM	5:00 PM	1	0	10	0	0	0	18	48	2	0	30	1	110	526	0	0	0	0
5:00 PM	5:15 PM	0	0	10	0	0	0	27	57	3	0	27	2	126	507	0	0	0	0
5:15 PM	5:30 PM	2	0	13	0	0	0	23	49	1	0	35	3	126	481	0	0	0	0
TOTAL		**5**	**0**	**104**	**3**	**0**	**3**	**178**	**376**	**11**	**2**	**407**	**21**			**1**	**0**	**1**	**0**
Peak Hr Vol		**1**	**0**	**58**	**3**	**0**	**3**	**91**	**181**	**4**	**2**	**273**	**13**			**1**	**0**	**1**	**0**
Peak Hr Factor		***0.25***		***0.85***	***0.38***		***0.25***	***0.88***	***0.87***	***0.50***	***0.25***	***0.90***	***0.65***						

Passenger Vehicles

Interval		Eastbound			Westbound			Northbound			Southbound		
Start	End	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
3:30 PM	3:45 PM	0	0	15	2	0	1	20	50	2	1	74	1
3:45 PM	4:00 PM	0	0	17	0	0	0	20	43	1	0	68	5
4:00 PM	4:15 PM	0	0	13	0	0	0	25	34	1	0	68	2
4:15 PM	4:30 PM	1	0	13	1	0	0	22	50	0	0	58	5
4:30 PM	4:45 PM	1	0	13	0	0	0	19	41	1	0	42	2
4:45 PM	5:00 PM	1	0	10	0	0	0	17	48	2	0	28	1
5:00 PM	5:15 PM	0	0	10	0	0	0	26	57	3	0	27	2
5:15 PM	5:30 PM	2	0	13	0	0	0	23	48	1	0	35	3
TOTAL		**5**	**0**	**104**	**3**	**0**	**1**	**172**	**371**	**11**	**1**	**400**	**21**
Peak Hr Vol		**1**	**0**	**58**	**3**	**0**	**1**	**87**	**177**	**4**	**1**	**268**	**13**

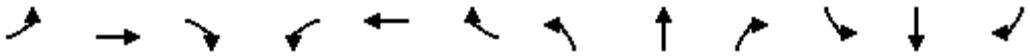
Heavy Vehicles

Interval		Eastbound			Westbound			Northbound			Southbound		
Start	End	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
3:30 PM	3:45 PM	0	0	0	0	0	2	2	2	0	1	2	0
3:45 PM	4:00 PM	0	0	0	0	0	0	1	2	0	0	0	0
4:00 PM	4:15 PM	0	0	0	0	0	0	1	0	0	0	1	0
4:15 PM	4:30 PM	0	0	0	0	0	0	0	0	0	0	2	0
4:30 PM	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	5:00 PM	0	0	0	0	0	0	1	0	0	0	2	0
5:00 PM	5:15 PM	0	0	0	0	0	0	1	0	0	0	0	0
5:15 PM	5:30 PM	0	0	0	0	0	0	0	1	0	0	0	0
TOTAL		**0**	**0**	**0**	**0**	**0**	**2**	**6**	**5**	**0**	**1**	**7**	**0**
Peak Hr Vol		**0**	**0**	**0**	**0**	**0**	**2**	**4**	**4**	**0**	**1**	**5**	**0**
% Heavy Vehicle		**0%**		**0%**	**0%**		**200%**	**5%**	**2%**	**0%**	**100%**	**2%**	**0%**

Bicycles

Interval		Eastbound			Westbound			Northbound			Southbound		
Start	End	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
3:30 PM	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Peak Hr Vol		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Appendix D: Synchro & SimTraffic Reports



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	1	50	3	1	1	61	211	1	2	655	14
Future Volume (Veh/h)	10	1	50	3	1	1	61	211	1	2	655	14
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.42	0.25	0.78	0.38	0.25	0.25	0.85	0.80	0.25	0.50	0.86	0.50
Hourly flow rate (vph)	24	4	64	8	4	4	72	264	4	4	762	28
Pedestrians		2										
Lane Width (m)		3.6										
Walking Speed (m/s)		1.0										
Percent Blockage		0										
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1200	1198	778	1260	1210	266	792			268		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1200	1198	778	1260	1210	266	792			268		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	84	98	84	93	98	99	91			100		
cM capacity (veh/h)	147	169	396	113	166	773	827			1296		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	92	16	72	268	794
Volume Left	24	8	72	0	4
Volume Right	64	4	0	4	28
cSH	264	160	827	1700	1296
Volume to Capacity	0.35	0.10	0.09	0.16	0.00
Queue Length 95th (m)	11.3	2.5	2.1	0.0	0.1
Control Delay (s)	25.8	30.1	9.8	0.0	0.1
Lane LOS	D	D	A		A
Approach Delay (s)	25.8	30.1	2.1		0.1
Approach LOS	D	D			

Intersection Summary				
Average Delay	2.9			
Intersection Capacity Utilization	58.9%	ICU Level of Service		B
Analysis Period (min)	15			

2: Silver Star Rd & Phoenix Dr/Bates Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR	All
Denied Del/Veh (s)	0.2	0.1	0.1	0.1	0.1	0.1	3.9	0.2	0.1	0.5	0.1	0.6
Total Del/Veh (s)	6.7	6.3	8.3	11.7	7.4	1.7	4.5	0.2	1.1	0.6	0.0	1.3

Total Network Performance

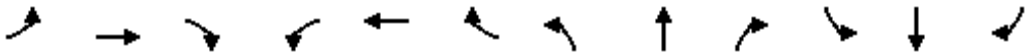
Denied Del/Veh (s)	0.6
Total Del/Veh (s)	1.9

Intersection: 2: Silver Star Rd & Phoenix Dr/Bates Rd

Movement	EB	WB	NB
Directions Served	LTR	LTR	L
Maximum Queue (m)	28.5	8.2	8.2
Average Queue (m)	9.3	1.4	4.9
95th Queue (m)	18.3	6.4	11.3
Link Distance (m)	132.6	106.4	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			30.0
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 0



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	1	93	3	1	1	111	222	1	2	688	23
Future Volume (Veh/h)	18	1	93	3	1	1	111	222	1	2	688	23
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.50	0.25	0.78	0.38	0.25	0.25	0.85	0.80	0.25	0.50	0.86	0.65
Hourly flow rate (vph)	36	4	119	8	4	4	131	278	4	4	800	35
Pedestrians		2										
Lane Width (m)		3.6										
Walking Speed (m/s)		1.0										
Percent Blockage		0										
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1374	1372	820	1488	1387	280	837			282		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1374	1372	820	1488	1387	280	837			282		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	65	97	68	86	97	99	84			100		
cM capacity (veh/h)	104	121	374	59	119	759	795			1280		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	159	16	131	282	839
Volume Left	36	8	131	0	4
Volume Right	119	4	0	4	35
cSH	228	92	795	1700	1280
Volume to Capacity	0.70	0.17	0.16	0.17	0.00
Queue Length 95th (m)	34.1	4.5	4.4	0.0	0.1
Control Delay (s)	50.8	52.2	10.4	0.0	0.1
Lane LOS	F	F	B		A
Approach Delay (s)	50.8	52.2	3.3		0.1
Approach LOS	F	F			

Intersection Summary				
Average Delay	7.3			
Intersection Capacity Utilization	66.2%	ICU Level of Service		C
Analysis Period (min)	15			

2: Silver Star Rd & Phoenix Dr/Bates Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.4	0.2	0.1	0.1	0.1	3.7	0.5	0.3	0.6	0.9	0.8
Total Del/Veh (s)	11.5	27.7	10.1	15.4	16.9	1.7	6.3	0.3	0.5	1.0	0.4	2.3

Total Network Performance

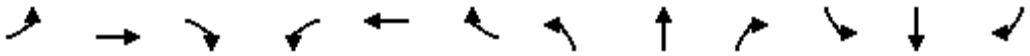
Denied Del/Veh (s)	0.8
Total Del/Veh (s)	3.2

Intersection: 2: Silver Star Rd & Phoenix Dr/Bates Rd

Movement	EB	WB	NB
Directions Served	LTR	LTR	L
Maximum Queue (m)	28.5	8.2	14.6
Average Queue (m)	13.2	1.5	7.3
95th Queue (m)	22.4	6.3	13.8
Link Distance (m)	132.6	106.4	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			30.0
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 0



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	33	1	181	3	1	1	212	243	1	2	753	41
Future Volume (Veh/h)	33	1	181	3	1	1	212	243	1	2	753	41
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.75	0.25	0.85	0.38	0.25	0.25	0.95	0.95	0.25	0.50	0.95	0.75
Hourly flow rate (vph)	44	4	213	8	4	4	223	256	4	4	793	55
Pedestrians		2										
Lane Width (m)		3.6										
Walking Speed (m/s)		1.0										
Percent Blockage		0										
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1538	1536	822	1748	1562	258	850			260		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1538	1536	822	1748	1562	258	850			260		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	37	95	43	63	95	99	72			100		
cM capacity (veh/h)	70	83	373	22	80	781	787			1304		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	261	16	223	260	852
Volume Left	44	8	223	0	4
Volume Right	213	4	0	4	55
cSH	209	38	787	1700	1304
Volume to Capacity	1.25	0.42	0.28	0.15	0.00
Queue Length 95th (m)	102.2	10.8	8.8	0.0	0.1
Control Delay (s)	190.2	158.0	11.4	0.0	0.1
Lane LOS	F	F	B		A
Approach Delay (s)	190.2	158.0	5.3		0.1
Approach LOS	F	F			

Intersection Summary				
Average Delay	34.0			
Intersection Capacity Utilization	78.1%	ICU Level of Service	D	
Analysis Period (min)	15			

2: Silver Star Rd & Phoenix Dr/Bates Rd Performance by movement

Movement	EBL	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR	All
Denied Del/Veh (s)	0.2	0.3	0.1	0.1	0.1	3.6	0.6	0.1	0.7	0.9	1.0
Total Del/Veh (s)	28.8	18.5	30.8	19.8	4.3	9.8	0.4	0.0	1.7	0.8	5.2

Total Network Performance

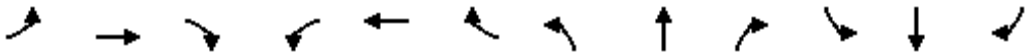
Denied Del/Veh (s)	1.0
Total Del/Veh (s)	6.1

Intersection: 2: Silver Star Rd & Phoenix Dr/Bates Rd

Movement	EB	WB	NB
Directions Served	LTR	LTR	L
Maximum Queue (m)	53.5	8.2	51.0
Average Queue (m)	24.7	1.5	15.1
95th Queue (m)	45.3	6.3	29.3
Link Distance (m)	132.6	106.4	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			30.0
Storage Blk Time (%)			1
Queuing Penalty (veh)			2

Network Summary

Network wide Queuing Penalty: 2



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	1	93	17	1	3	111	222	14	4	688	23
Future Volume (Veh/h)	18	1	93	17	1	3	111	222	14	4	688	23
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.50	0.25	0.78	0.50	0.25	0.35	0.85	0.80	1.00	0.50	0.86	0.65
Hourly flow rate (vph)	36	4	119	34	4	9	131	278	14	8	800	35
Pedestrians		2										
Lane Width (m)		3.6										
Walking Speed (m/s)		1.0										
Percent Blockage		0										
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1386	1390	820	1502	1400	285	837			292		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1386	1390	820	1502	1400	285	837			292		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	64	97	68	41	97	99	84			99		
cM capacity (veh/h)	100	118	374	58	116	754	795			1270		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	159	47	131	292	843
Volume Left	36	34	131	0	8
Volume Right	119	9	0	14	35
cSH	224	74	795	1700	1270
Volume to Capacity	0.71	0.63	0.16	0.17	0.01
Queue Length 95th (m)	35.0	21.3	4.4	0.0	0.1
Control Delay (s)	52.8	115.0	10.4	0.0	0.2
Lane LOS	F	F	B		A
Approach Delay (s)	52.8	115.0	3.2		0.2
Approach LOS	F	F			

Intersection Summary				
Average Delay	10.4			
Intersection Capacity Utilization	66.9%	ICU Level of Service		C
Analysis Period (min)	15			

2: Silver Star Rd & Phoenix Dr/Bates Rd Performance by movement

Movement	EBL	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.2	0.2	0.1	0.1	3.6	0.5	0.4	2.9	0.6	0.9	0.8
Total Del/Veh (s)	51.1	25.0	24.6	32.2	13.0	7.1	0.4	0.2	3.1	1.2	0.8	4.4

Total Network Performance

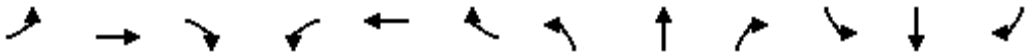
Denied Del/Veh (s)	0.8
Total Del/Veh (s)	5.2

Intersection: 2: Silver Star Rd & Phoenix Dr/Bates Rd

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	L	LTR
Maximum Queue (m)	72.3	20.5	14.6	8.4
Average Queue (m)	17.8	3.0	8.3	0.3
95th Queue (m)	44.2	11.0	14.4	2.9
Link Distance (m)	132.6	106.4		141.7
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)			30.0	
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	33	1	181	17	1	3	212	243	14	4	753	41
Future Volume (Veh/h)	33	1	181	17	1	3	212	243	14	4	753	41
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.75	0.25	0.85	0.38	0.25	0.25	0.95	0.95	0.25	0.50	0.95	0.75
Hourly flow rate (vph)	44	4	213	45	4	12	223	256	56	8	793	55
Pedestrians		2										
Lane Width (m)		3.6										
Walking Speed (m/s)		1.0										
Percent Blockage		0										
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1554	1596	822	1782	1596	284	850			312		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1554	1596	822	1782	1596	284	850			312		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	35	95	43	0	95	98	72			99		
cM capacity (veh/h)	67	76	373	20	76	755	787			1248		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	261	61	223	312	856
Volume Left	44	45	223	0	8
Volume Right	213	12	0	56	55
cSH	204	27	787	1700	1248
Volume to Capacity	1.28	2.27	0.28	0.18	0.01
Queue Length 95th (m)	105.3	55.3	8.8	0.0	0.1
Control Delay (s)	203.1	894.7	11.4	0.0	0.2
Lane LOS	F	F	B		A
Approach Delay (s)	203.1	894.7	4.7		0.2
Approach LOS	F	F			

Intersection Summary				
Average Delay	64.4			
Intersection Capacity Utilization	78.5%	ICU Level of Service	D	
Analysis Period (min)	15			

2: Silver Star Rd & Phoenix Dr/Bates Rd Performance by movement

Movement	EBL	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR	All
Denied Del/Veh (s)	3.1	2.4	0.2	0.1	3.5	0.6	0.6	0.8	0.8	0.8	1.4
Total Del/Veh (s)	119.6	93.4	65.2	52.7	11.0	0.5	0.4	3.4	1.9	1.0	17.0

Total Network Performance

Denied Del/Veh (s)	1.4
Total Del/Veh (s)	17.9

Intersection: 2: Silver Star Rd & Phoenix Dr/Bates Rd

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	L	LTR
Maximum Queue (m)	137.2	27.5	50.9	6.4
Average Queue (m)	56.6	5.0	16.7	0.4
95th Queue (m)	133.9	16.5	30.3	3.1
Link Distance (m)	132.6	106.4		141.7
Upstream Blk Time (%)	12			
Queuing Penalty (veh)	0			
Storage Bay Dist (m)			30.0	
Storage Blk Time (%)			1	
Queuing Penalty (veh)			2	

Network Summary

Network wide Queuing Penalty: 2