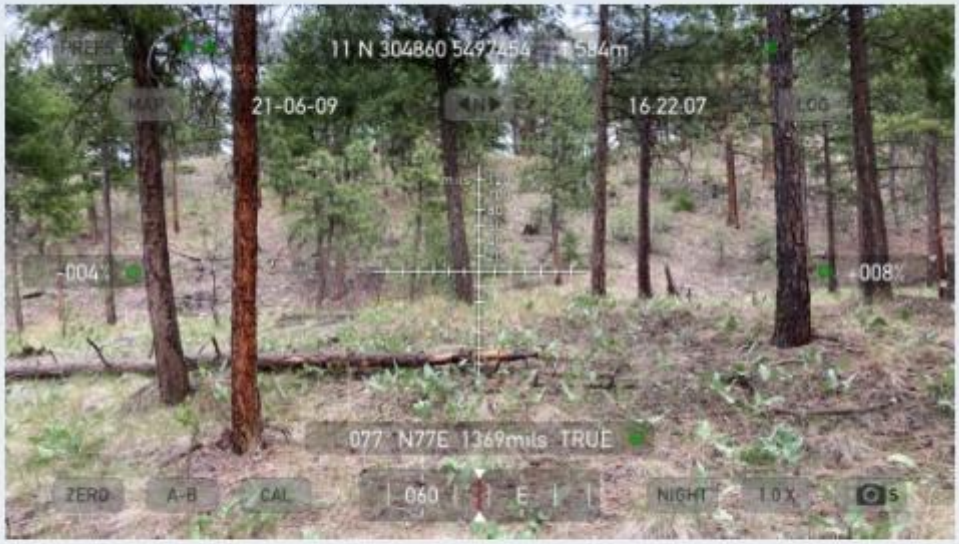

Wildfire Hazard Assessment & Mitigation Report – Vol. 1 of 2

Summerland Integrated Solar Project (Scope A)
Cartwright Eco-Village Development Proposal (Scope B)

Prepared for:
District of Summerland
13211 Henry Ave. Summerland BC V0H 1Z0

Prepared by:
Andrew K. Low, RPF
Frontline Operations Group Ltd.
8816 Oxford Rd. Vernon BC V1B 2B4

Frontline Operations Group

July, 2021

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Professional Reliance

Wildfire Hazard Assessment & Mitigation Report:
Integrated Solar Project (Scope A)
Cartwright Development Proposal (Scope B)

Prepared for:

Tami Rothery
Sustainability/Alternative Energy Coordinator
District of Summerland
PO Box 159
13211 Henry Ave. Summerland BC V0H 1Z0

Prepared by:

Frontline Operations Group Ltd.
8816 Oxford Rd. Vernon BC V1B 2B4

Registered Professional Forester:	
Andrew K. Low	RPF 4949
Date signed	
July 13, 2021	

(Affix seal/stamp and sign)

REGISTERED PROFESSIONAL FORESTER
PROVINCE OF BRITISH COLUMBIA
ANDREW K. LOW
NO. 4949

"I certify that the work described herein fulfills the standards expected of a member of the Association of British Columbia Forest Professionals and that I did personally supervise the work."

Supervision certification statement

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Executive Summary

Frontline Operations Group Ltd. (Frontline) was retained by the District of Summerland for the purposes of completing a wildfire hazard assessment and mitigation report for two adjacent projects: the Integrated Solar Project (described herein as Scope A) and the Cartwright Eco-Village Development Proposal (described herein as Scope B). The report was requested by Summerland as a development permit requirement as the two projects are situated within the Summerland Wildfire Hazard Lands.

An onsite assessment that included 12 Wildland Urban Interface Wildfire Threat Assessment (WUI threat assessment) plots throughout the Scope A and B areas was conducted in June 2021. The results of the threat assessments were as follows:

- Plot S31:
    - Wildfire Behaviour Threat Class: High
    - WUI Threat Class: High
- Plot S32:
    - Wildfire Behaviour Threat Class: Low
    - WUI Threat Class: Low
- Plots S33 to S42:
    - Wildfire Behaviour Threat Class: Moderate
    - WUI Threat Class: Moderate

Mitigation recommendations have been provided for Scope A and B. The recommendations generally pertain to the future state and condition of the areas once they have been completed and/or established. Recommendations are also provided that relate to the ongoing maintenance of structures and property in order to maintain FireSmart characteristics. One recommendation specifically addresses an area of High Wildfire Behaviour Threat Class along two of the access corridors.

Statement of Qualifications – Andrew K. Low

The opinions and discussion contained in the enclosed report are based on the author's 20 years of experience in wildfire management in Western Canada. My education includes a Diploma of Technology in Forestry from the BC Institute of Technology and a Bachelor of Natural Resource Science from Thompson Rivers University. I have been a Registered Professional Forester in good standing with the Association of BC Forest Professionals since 2015.

My work and professional experience related to wildfire preparedness, prevention, operations, and management includes:

- three years with the Government of Canada (Parks Canada) working in the Fire Management Program for the mountain National Parks, including rappel crew firefighting and prescribed burn operations;
- fifteen years with the BC Wildfire Service, including five years with the Rapattack program, five years in the Penticton Fire Zone, and four years in the Provincial Wildfire Coordination Centre as the Provincial Wildfire Preparedness Officer;
- five years on incident management teams (IMT) as Operations Section Chief, Safety Officer and Branch or Division Supervisor;
- guest lecturer for the fourth-year Fire Ecology and Management course (NRSC 4130) at Thompson Rivers University since 2014;
- current member of the Program Advisory Committee for the Forest and Natural Areas Management program at BCIT;
- wildfire, forestry, and emergency management consulting since 2017, including carrying out a helitack training course and fire preparedness and prevention project in East Kalimantan, Indonesia for a major forest products firm;
- lead author and signing professional on eight Community Wildfire Protection Plans (CWPP); including the most recent CWPP for the District of Summerland,

- facilitation of over 12 FireSmart Community Recognition projects as a trained Local FireSmart Representative.

My wildfire operations certifications and experience with the BC Wildfire Service include:

- Incident Commander Type 2;
- Operations Section Chief Type 2;
- Safety Officer Type 1;
- Operations Branch Director; and
- Division/Group Supervisor.

Advanced-level wildfire management and operations training from the BC Wildfire Service (BCWS) and Canadian Interagency Forest Fire Centre (CIFFC) include:

- S-490 Advanced Wildland Fire Behaviour (CIFFC);
- S-434 Ignition Specialist (CIFFC);
- I-400 Incident Command System for Command and General Staff (CIFFC);
- S-411 Weather for Fire Operations (BCWS)
- FI-210 Fire Origin and Cause Investigation (BCWS)

Table of Contents

List of Figures

List of Tables

Introduction

Frontline Operations Group Ltd. (Frontline) was retained by the District of Summerland for the purposes of completing a wildfire hazard assessment and mitigation report for two adjacent projects: the Integrated Solar Project (described herein as Scope A) and the Cartwright Eco-Village Development Proposal (described herein as Scope B).

The report was requested by Summerland as a development permit requirement as the two projects are situated within the Wildfire Hazard Areas 1, as defined in section 25 (Wildfire Hazard Development Permit Area #1) in the 2015 District of Summerland Official Community Plan[1]. The scope and content of the report is guided by section 6 of the Terms of Reference Professional Report and Technical Studies ((District of Summerland, 2018).

Information provided to Frontline for the purposes of completing this report included Google Earth KMZ files detailing the proposed boundaries or extents (i.e., footprints) of the solar project, the Cartwright development, and access corridors. No building designs, technical infrastructure drawings, solar infrastructure technical specifications or construction plans were provided. This report is limited to an assessment of wildfire hazard and mitigation recommendations – matters related to firefighting in and around solar panels and related infrastructure, including batteries, is beyond the scope of practice and expertise of Frontline and this report.

Site Overview

The report area of interest (AOI) is approximately 26.2 ha on five municipal-owned parcels (see Figure 1) with the following PIDs:

- 012646709
- 009833722
- 012646695

[1] https://www.summerland.ca/docs/default-source/development-services/bylaws/2014-ocp---schedule-a-consolidated-to-2018-09-11.pdf?sfvrsn=e7bbf2fb_2 July 2, 2021

- 012646717
- 012646601

Overstory vegetation on the property and in the surrounding area is primarily comprised of Ponderosa pine (*Pinus ponderosa)* and Douglas-fir (*Pseudotsuga menziesii).* The onsite field assessment was conducted under snow-free conditions in June 2021.

Methods

Established and recognized methods for assessing wildfire and wildland urban interface (WUI) hazards were used for the purposes of this report. These methods are consistent with the requirements for professional practice of a Registered Professional Forester with the Association of BC Forest Professionals (ABCFP, 2013).

Fire History

An assessment of the wildfire history within a 2 km buffer around the Summerland municipal boundary was completed by Frontline in 2021 during the update of the Summerland CWPP. For this report we have analysed the wildfire history of a 2 km buffer area around the Cartwright parcels. The BC Wildfire Service (BCWS) maintains a provincial database of known wildfires in the province (DataBC, 2021). This database contains detailed information for wildfires dating back to the early 1950s. Large wildfires that occurred prior to the 1950s are reflected in the historical database as well, though the level of detail is less than the post-1950 dataset. The earliest fires in the provincial database date from the early 1900s, though wildfires have occurred in the area for thousands of years.

Historic[2] wildfires were analyzed in relation to the District of Summerland. The annual wildfire occurrence and area burned is presented in order to characterize recent wildfire history in the surrounding area.

[2] Wildfires that occurred prior to March 31, 2021.

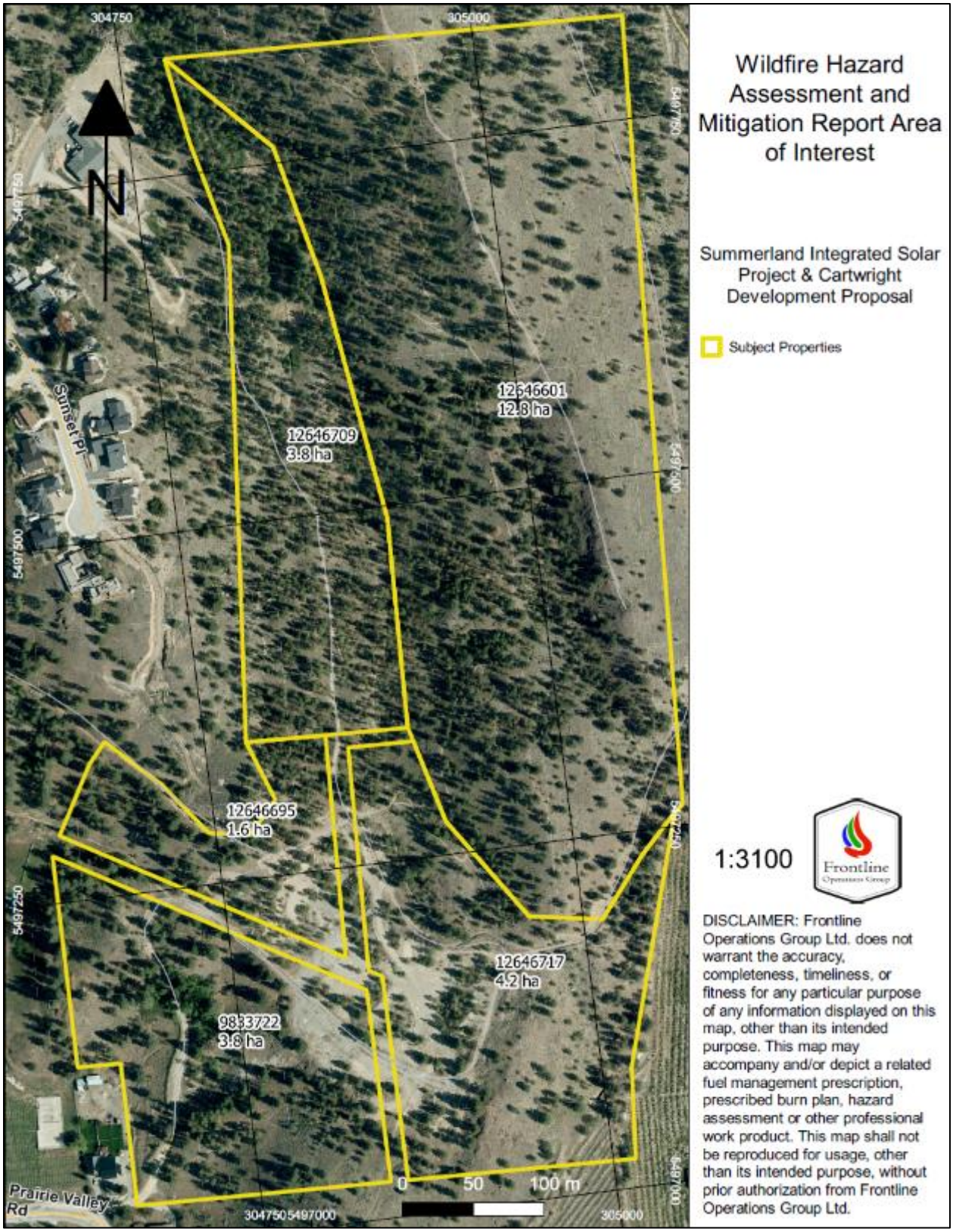

Figure 1 Overview map of the report area of interest.

Fire Behaviour

Wildland fire behaviour refers to the way a wildfire ignites and spreads according to the influence of fuel characteristics, weather conditions and topography. In Canada, wildland fuels are classified into 16 fuel types within the Canadian Forest Fire Behaviour Prediction (FBP) System (Taylor & Alexander, 2016). The FBP system is informed by the Canadian Forest Fire Danger Rating System (CFFDRS) (Lawson, et al., 1985), which is the primary tool to obtain predictive wildfire management intelligence used by agencies across Canada. The fuel type on the subject property and surrounding area has been classified according to the FBP system.

Fire weather refers to weather conditions that effect the moisture content of fuels, influence the rate and direction of fire spread and broadly influence the atmosphere in which a fire burns. Day to day fire weather conditions are described according to the Fire Weather Index system – a series of codes and indices that relate to fuel moisture and fire behaviour. Three BCWS fire weather stations, located at Brenda Mines, Penticton, and West Kelowna (see Figure 2) (Data BC, 2021) were analyzed by Frontline during the Summerland CWPP update in 2021, and are presented in this report to characterize fire weather conditions in the general area.

In the context of the fire environment, topography refers to the shape and features of the landscape. Of primary importance for an understanding of fire behaviour is slope and aspect. The topographical characteristics and their influence on wildland fire behaviour have been assessed and described.

Wildland Urban Interface Wildfire Threat Assessment

The Wildland Urban Interface Wildfire Threat Assessment (Morrow, et al., 2013) was developed to specifically assess wildfire hazard characteristics within the WUI[3]. The

[3] The original Morrow et al. assessment tool has since been adapted by the BCWS into the current Wildfire Threat Assessment (BC Wildfire Service, 2016), in part "to help validate, qualify or ground truth the PSTA (Provincial Strategic Threat Analysis) threat rating…" which differs from the original intent of the Morrow et al. assessment.

Morrow et al. assessment method characterises the immediate wildfire environment and how it relates to the location of the WUI values, whereas the most recent assessment methodology developed by the BCWS seeks to include validation of the Provincial Strategic Threat Assessment layer. The former is more appropriate for site level assessments, while the latter is better suited for landscape level assessments as part of a larger fire management strategy.

The Wildland Urban Interface Wildfire Threat Assessment (WUI Threat Assessment) worksheet is organized into two components: the wildfire environment (fuel, weather, and topography); and the structural characteristics of the value for which the threat is being assessed.

Twelve WUI Threat Assessment plots (threat plots) were completed (Figure 3). Plot locations were subjectively chosen to best capture the observed variability of the project sites.

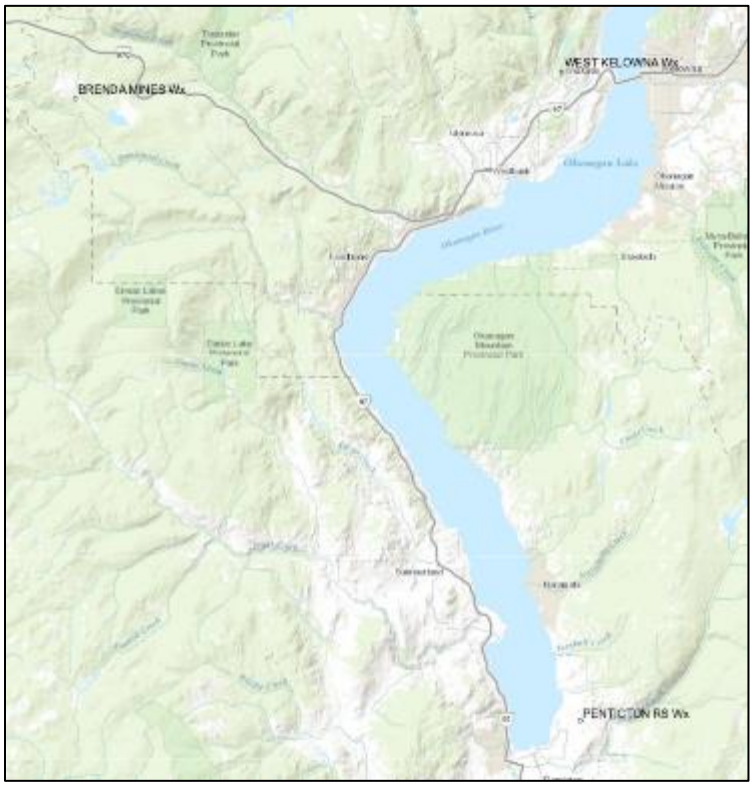

Figure 2 Locations of Brenda Mines, Penticton, and West Kelowna fire weather stations, in relation to Summerland.

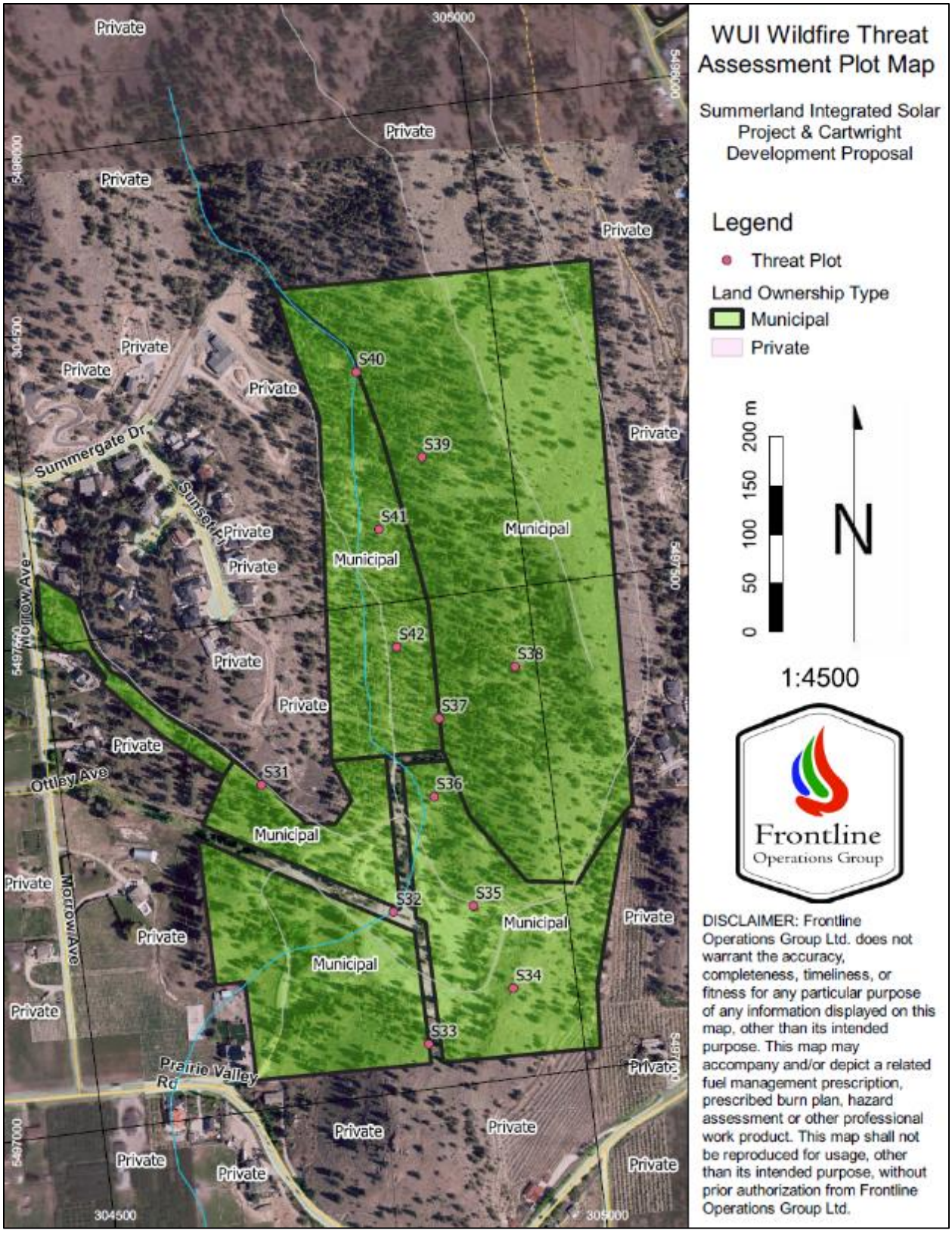

Figure 3 Twelve WUI Threat Assessment plots were completed across the two project sites.

Results

Fire History

Between 1960 and 2003, 13 wildfires are recorded within a 2 km buffer surrounding the subject properties in the provincial fire history dataset (Figure 5). Of these, 10 were human caused, while the remaining three were caused by lightning. Specific fire cause (e.g., open burning; equipment; arson etc.) is not provided in the public database.

The total burned area within a 2 km buffer around the subject properties has been 138.7 ha since 1946. As depicted in Figure 4, historic fire perimeters were clipped to the 2 km buffer, so that only the portions of fires within the buffer are represented in this analysis. The burned area inside the buffer is attributed to four wildfires between 1946 and 1996 (Figure 6).

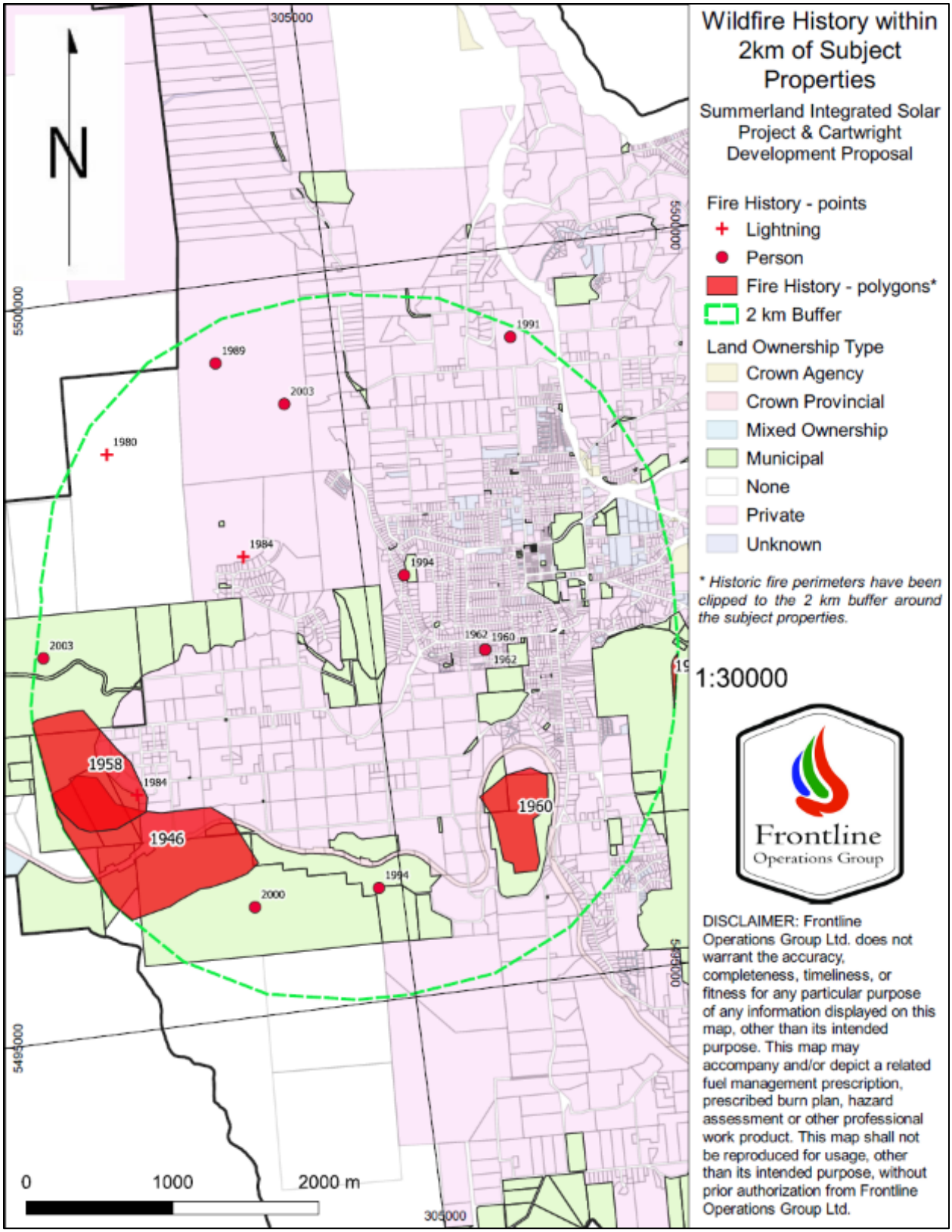

Figure 4 Historic wildfire points and perimeters, clipped to a 2 km buffer around the subject properties.

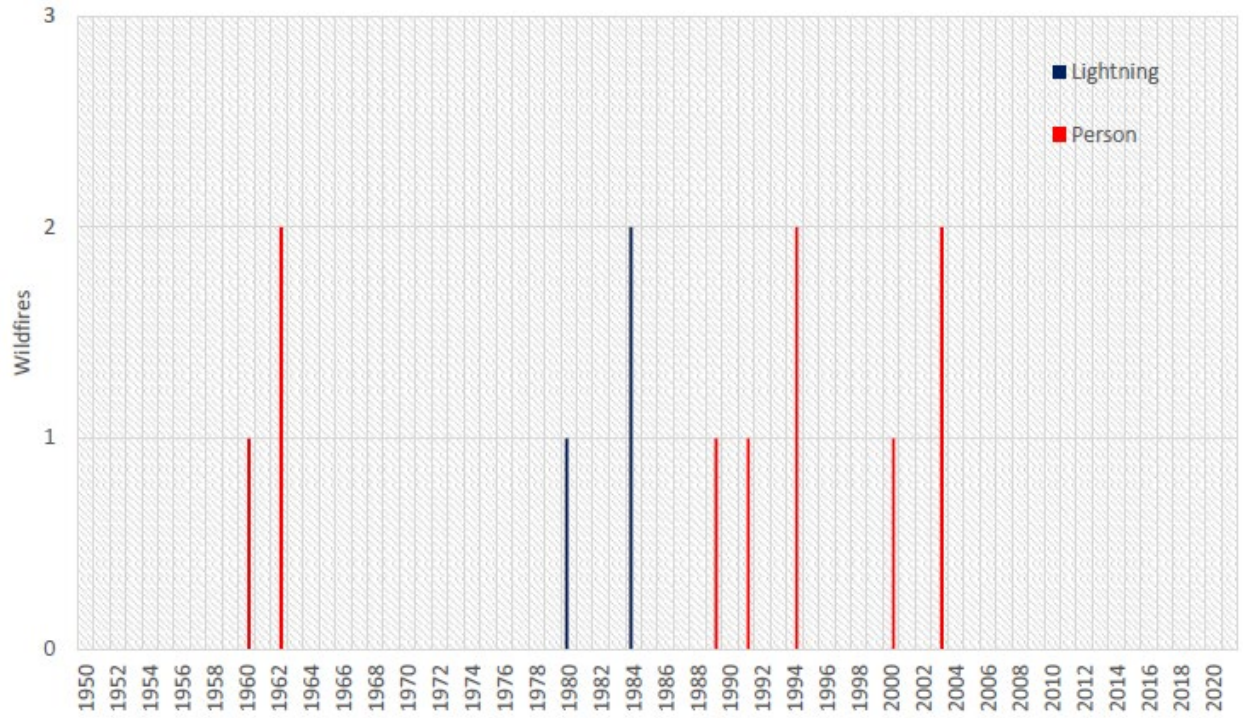

Figure 5 Annual wildfire occurrence within 2 km of the subject properties, from 1950 to 2020.

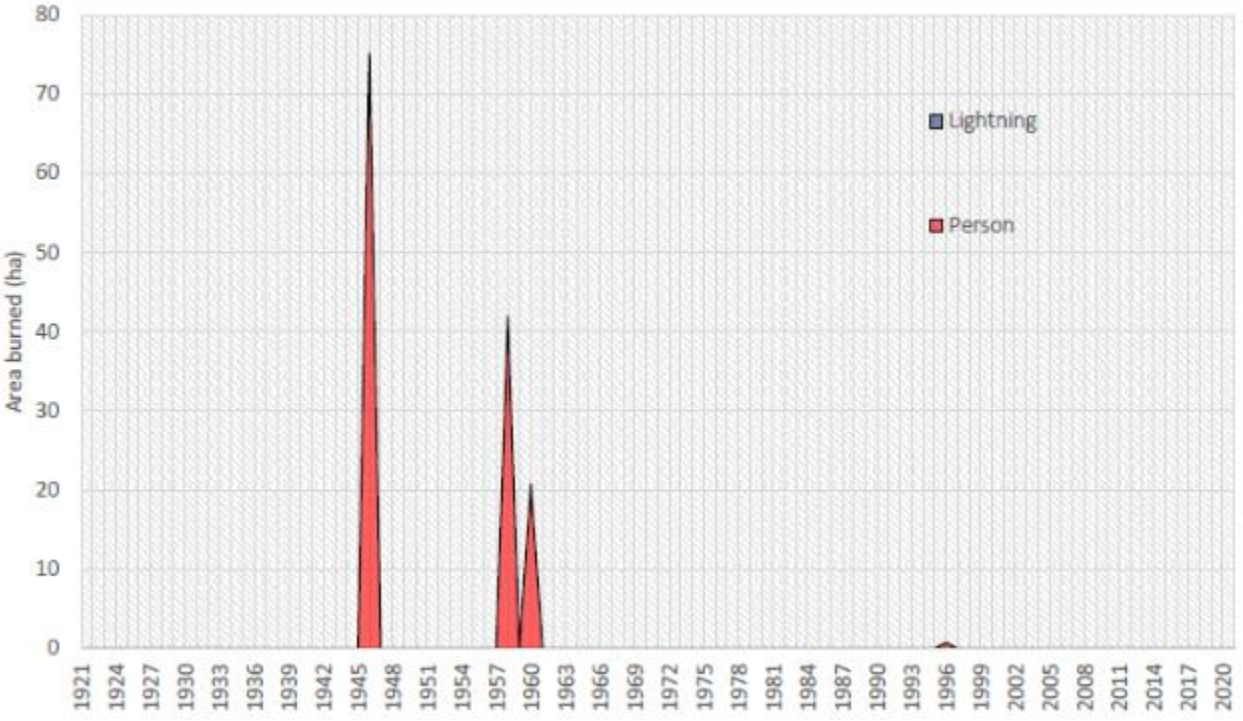

Figure 6 Annual area burned within 2 km of the subject properties since 1921.

Fire Behaviour

In the context of wildland fire, fuel refers to the organic matter involved in combustion. When referring to the WUI, structures, vehicles and other improvements become a component of the fuel complex. An awareness of the fuel conditions around built-up areas will help planners and residents alike assess and mitigate fuel hazards.

The FBP System fuel type for wildland areas on and adjacent to the project areas is predominantly characteristic of a C-7 Ponderosa Pine/Douglas-fir fuel type (Figure 7). The C7 fuel type is characterized by relatively open (<50% canopy closure), uneven-aged stands of Ponderosa pine (*Pinus ponderosa*) and Douglas-fir (*Pseudotsuga menziesii*). Generally, surface fuels are characterized by perennial grasses, herbs, and scattered shrubs. In the absence of periodic fire (or other maintenance), needle litter tends to build up and persist for some time. Duff layers are relatively shallow – typically less than 3 cm (Taylor & Alexander, 2016).

Figure 7 Photo looking southwest from the southwest quadrant of the project areas. The vegetation complex is representative of the majority of wildland fuel in the general area and is best descibed as a C7 – Ponderosa pine and Douglas-fir fuel type.

Weather conditions affect the moisture content of wildland fuels and influence the rate of spread, spread direction and intensity of a wildland fire. Weather is the most dynamic element of the fire environment and the most challenging to assess and

forecast. When analysing fire weather conditions and patterns a useful benchmark is the Fire Danger Class.

Fire Danger Class is defined in the Wildfire Regulation and is a rating derived in large part from outputs of the Canadian Forest Fire Weather Index (FWI) System. Although the intent of the Fire Danger Class rating scheme is to restrict high risk activities (primarily industrial) occurring on or about forest and grassland areas, the use of Fire Danger Class has been extended to other aspects of wildfire management, including prevention planning, hazard assessment, and Community Wildfire Protection Plans (CWPPs) as a straightforward means of characterizing fire weather conditions in an area represented by a weather station.

Fire Danger Class is determined by comparing the Buildup Index (BUI) to the Fire Weather Index (FWI) in one of three tables presented in the Wildfire Regulation. Each table is specific to one of three broad Danger Regions in BC; the Okanagan is situated in Danger Region 3, along with the three fire weather stations that were used in this analysis. The actual Fire Danger classes are numerical ratings 1-5, in ascending order of severity and are also used on fire prevention signs and elsewhere, though the ratings are descriptive (Very Low to Extreme). An illustration of the various inputs and components from which Fire Danger Class is derived is presented in Figure 8.

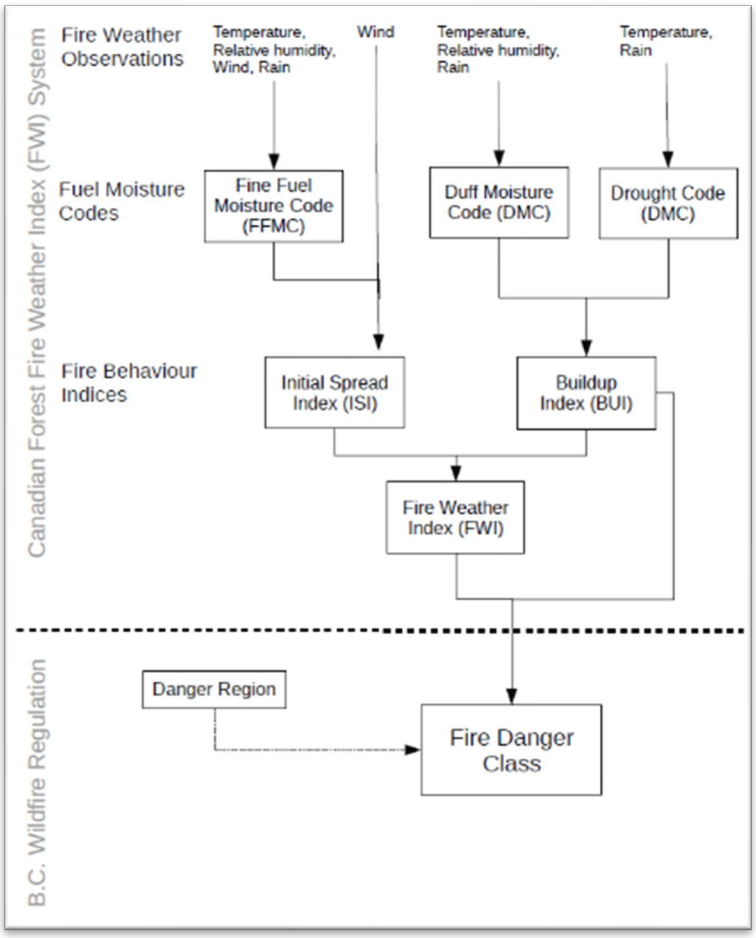

Figure 8 Inputs to determine Fire Danger Class (graphic produced by Low, 2018 through adaptation from Taylor & Alexander, 2016).

A Fire Danger Class report has been prepared for each of the Brenda Mines, Penticton, and West Kelowna fire weather stations, whereby Fire Danger Class 4 and 5 are summarized (see Figure 9 to Figure 11). Both the Brenda Mines (Figure 9) and Penticton (Figure 10) stations display an increasing linear trend of Fire Danger Class 4 and 5 days per year. The West Kelowna station (Figure 11) has only been in operation since 2017 and does not have enough data to draw conclusions related to trends.

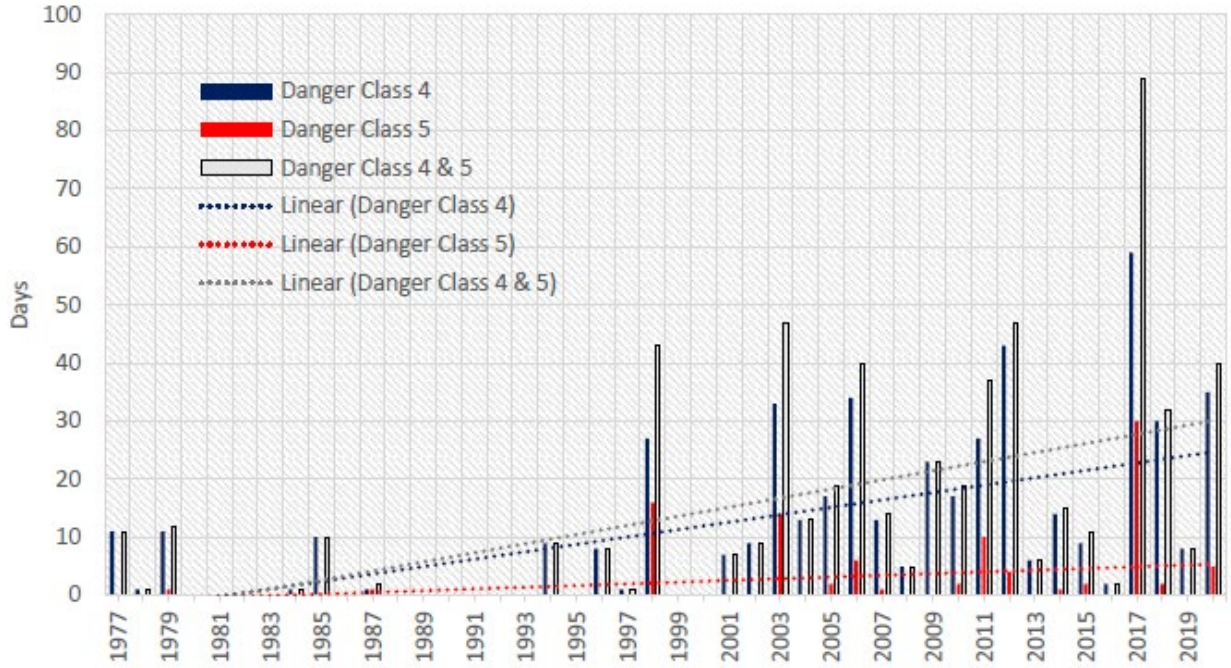

Figure 9 Fire Danger Class 4 and 5 report for the Brenda Mines fire weather station, 1977 to 2020.

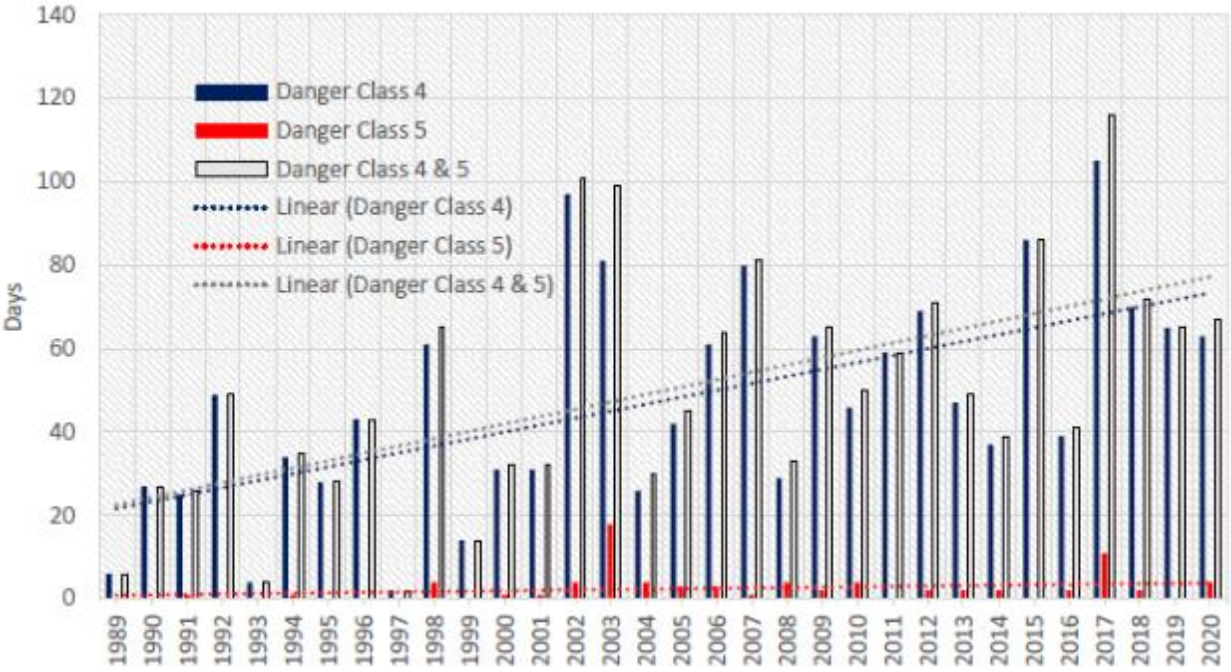

Figure 10 Fire Danger Class 4 and 5 report for the Penticton RS fire weather station, 1989 to 2020.

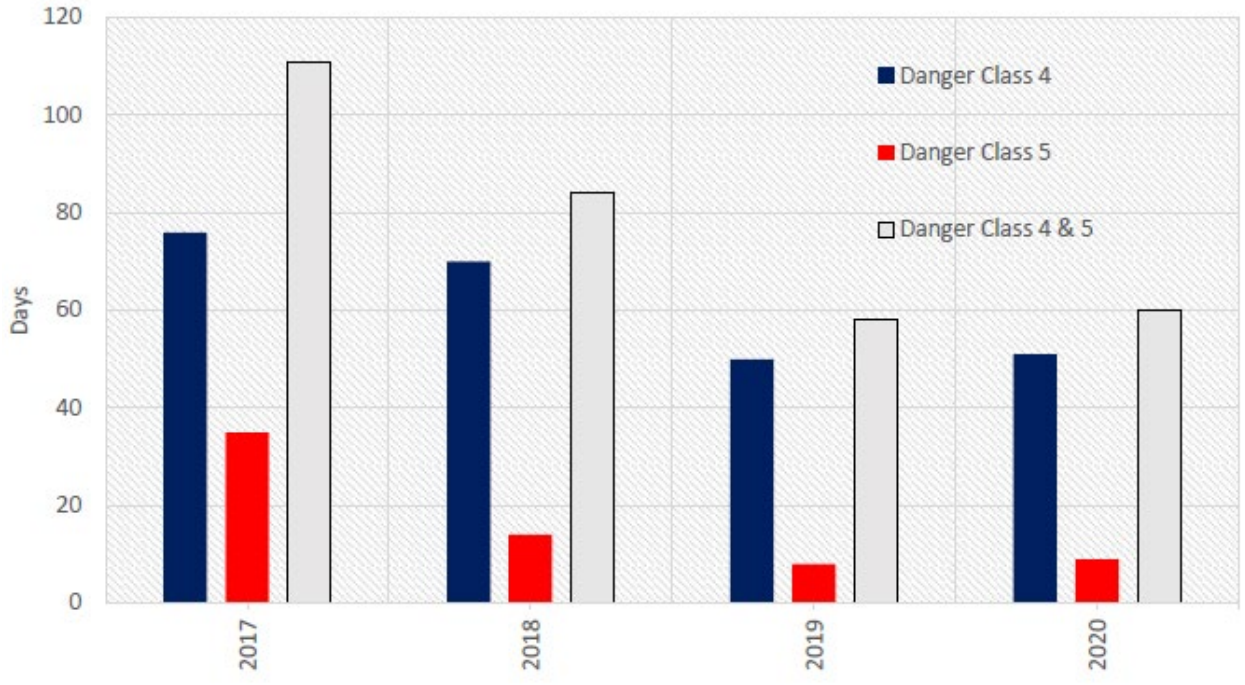

Figure 11 Fire Danger Class 4 and 5 report for the West Kelowna fire weather station, 2017 to 2020.

We have also calculated the seasonal severity rating (SSR) for the Fintry station (Figure 12). The SSR makes use of the daily severity rating (DSR), which is calculated as follows:

$$DSR = 0.0272*FWI^{1.77}$$

where FWI is the daily Fire Weather Index

The SSR is simply the mean of the DSRs over the course of one fire season. When the SSR for Brenda Mines (Figure 12) and Penticton (Figure 13) are graphed, we observe an increasing trend similar to that attributed to Fire Danger Class. The West Kelowna station does not have enough data to draw conclusions related to SSR.

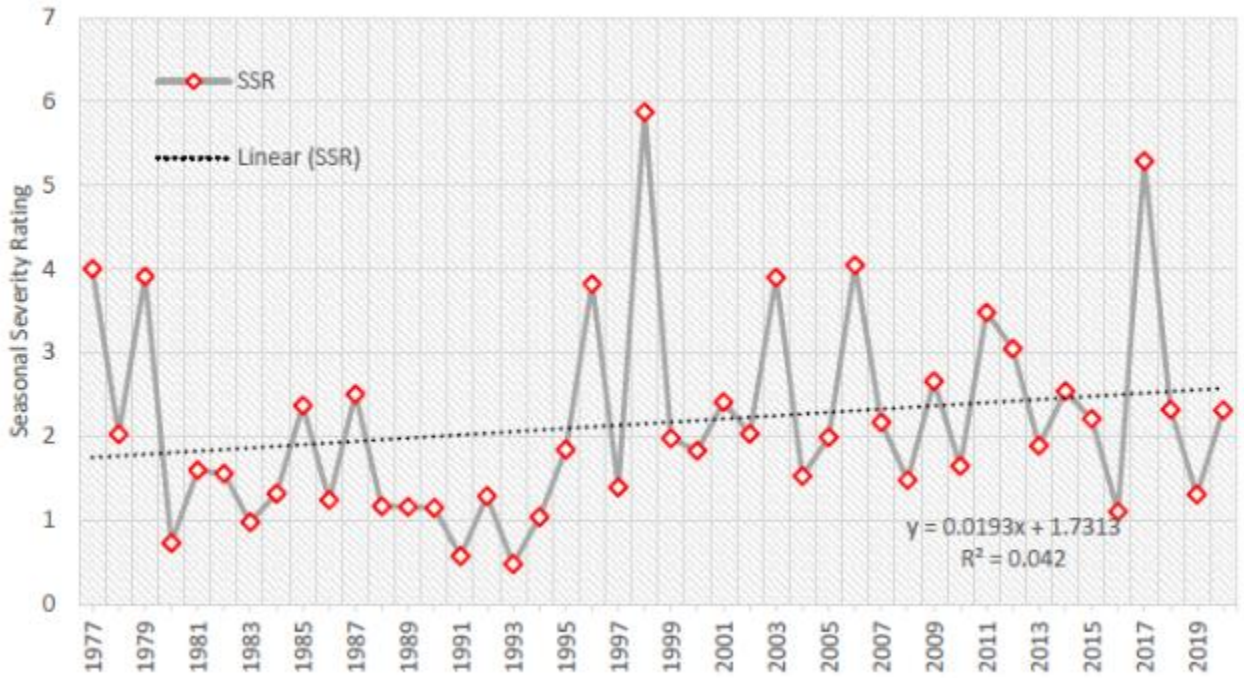

Figure 12 Seasonal severity rating (SSR) calculated for the Brenda Mines fire weather station, 1977 to 2020.

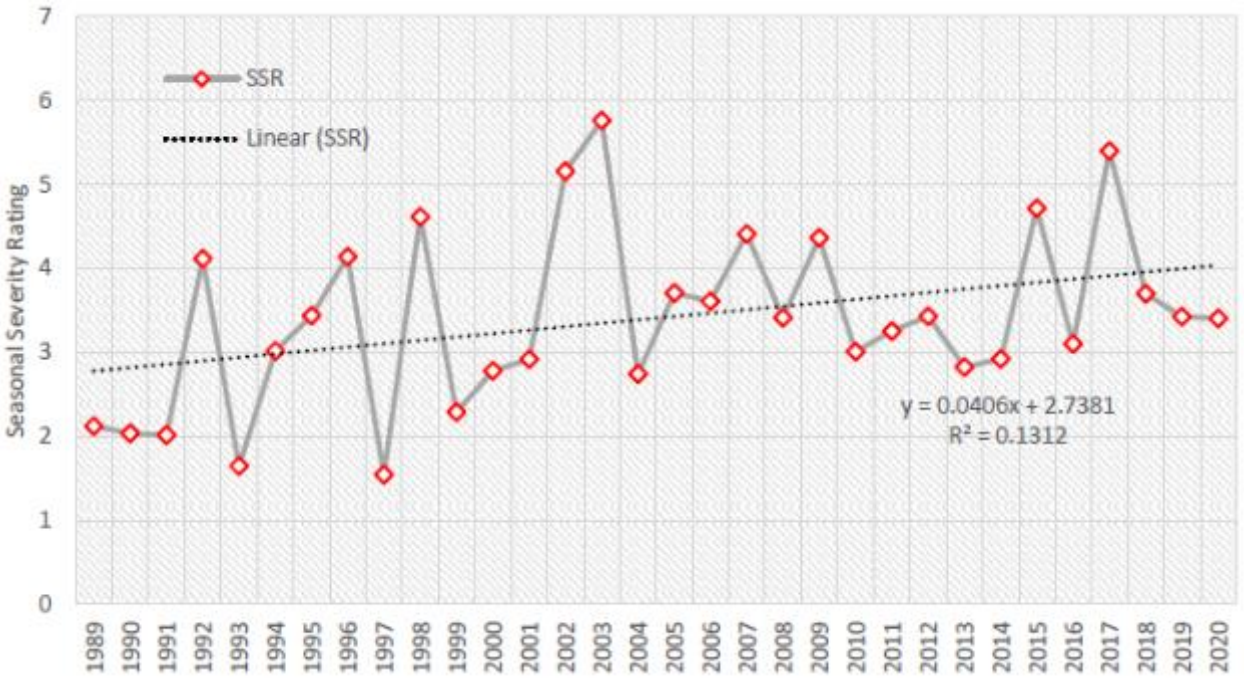

Figure 13 Seasonal severity rating (SSR) calculated for the Penticton RS fire weather station, 1989 to 2020.

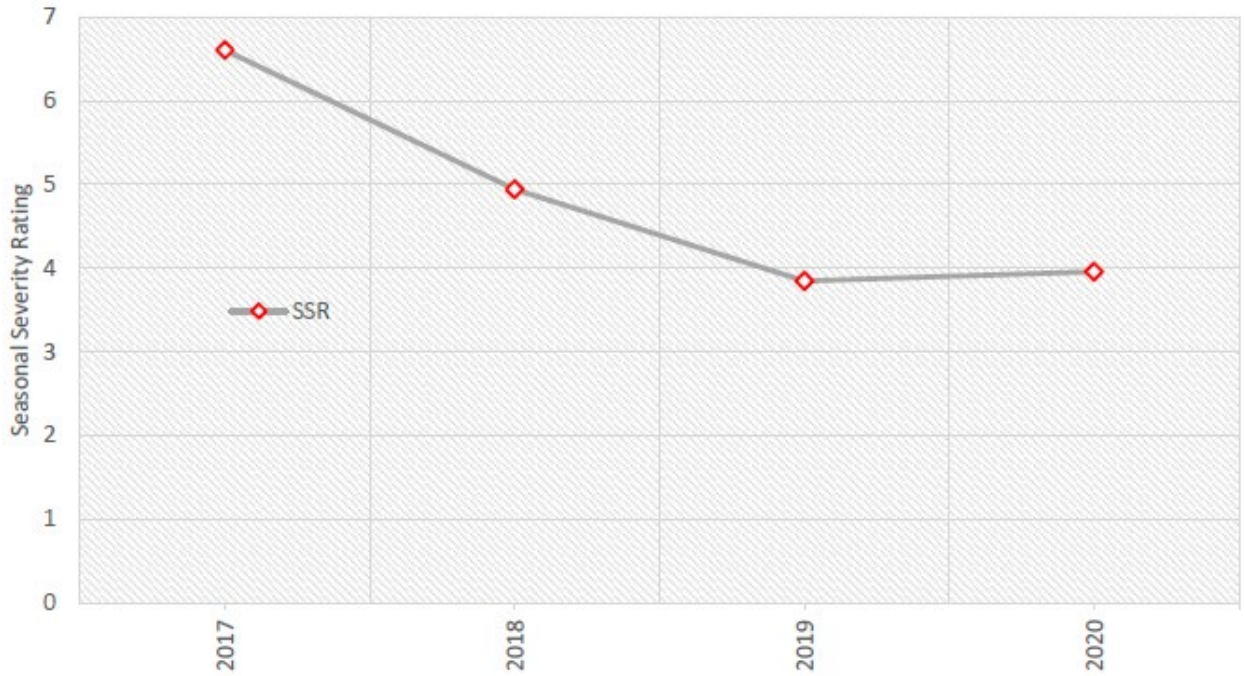

Figure 14 Seasonal severity rating (SSR) calculated for the West Kelowna fire weather station, 2017 to 2020.

Wildfire Behaviour Threat Class

The Wildland Urban Interface Wildfire Threat Assessment begins with an assessment of fuel characteristics and then proceeds to weather factors and topography. Should the fuel rating not exceed 29 points there is no need to proceed with the remainder of the assessment and the Wildfire Behaviour Threat Class will be rated as Low.

The Wildfire Behaviour Threat Class components for the 12 threat assessment plots completed on the subject properties are summarized in Table 1. Of the 12 threat assessments, one scored a Wildfire Behaviour Threat Class of High, and one scored a Low classification, with the remainder scoring as Moderate.

The results have been used to stratify the subject properties according to Wildfire Behaviour Threat Class to produce a map of the area delineating High, Moderate, and Low threat class areas (Figure 15). The resulting threat polygons appear to agree with the site history: the Low threat area is predominantly comprised of the brownfield gravel pit; the Moderate threat area recently underwent a fuel reduction treatment; and the High threat area has remained relatively unmanaged.

Table 1 Summary of the WUI Threat Assessment worksheets completed at subject properties. Scope A is the solar project and Scope B is the Cartwright Development Proposal.

		WUI Wildfire Threat Plots											
		Scope A						Scope B					
Component	Subcomponent	S31	S32	S33	S34	S35	S36	S37	S38	S39	S40	S41	S42
Wildfire Behaviour Threat Class	Fuel (155 points)	46	15	38	29	38	38	35	35	37	36	43	38
	Weather (30 points)	25	0	25	25	25	25	25	25	25	25	25	25
	Topography (55 points)	32	0	16	22	16	16	24	22	24	16	16	16
	Wildfire Behaviour Threat Score (240 points)	103	15	79	76	79	79	84	82	86	77	84	79
	Wildfire Behaviour Threat Class	High	Low	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Mod
WUI Wildfire Threat Class	Structural (55 points)	35	1	15	15	15	15	15	15	15	15	15	15
	WUI Wildfire Threat Class	High	Low	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Mod
Total Wildfire Threat Score (295 points)		138	16	94	91	94	94	99	97	101	92	99	94

Wildland Urban Interface Threat Class

The structural component of the Wildland Urban Interface Wildfire Threat Assessment that produces the Wildland Urban Interface Threat Class is only assessed if the previous Wildfire Behaviour Threat Class is High or Extreme. In this instance, only one plot (plot S31) scored high enough to warrant proceeding to the WUI Threat Class component of the assessment. If the Wildfire Behaviour Threat Class is scored as Moderate, then typically the WUI Threat Class is defaulted to match the same classification. For simplicity, the WUI Threat Class for plots S33 to S42 have been assigned a score of 15 points for the Structural subcomponent in order to reflect a Moderate WUI Wildfire Threat Class. See Table 1 for a summary of WUI Wildfire Threat Class information.

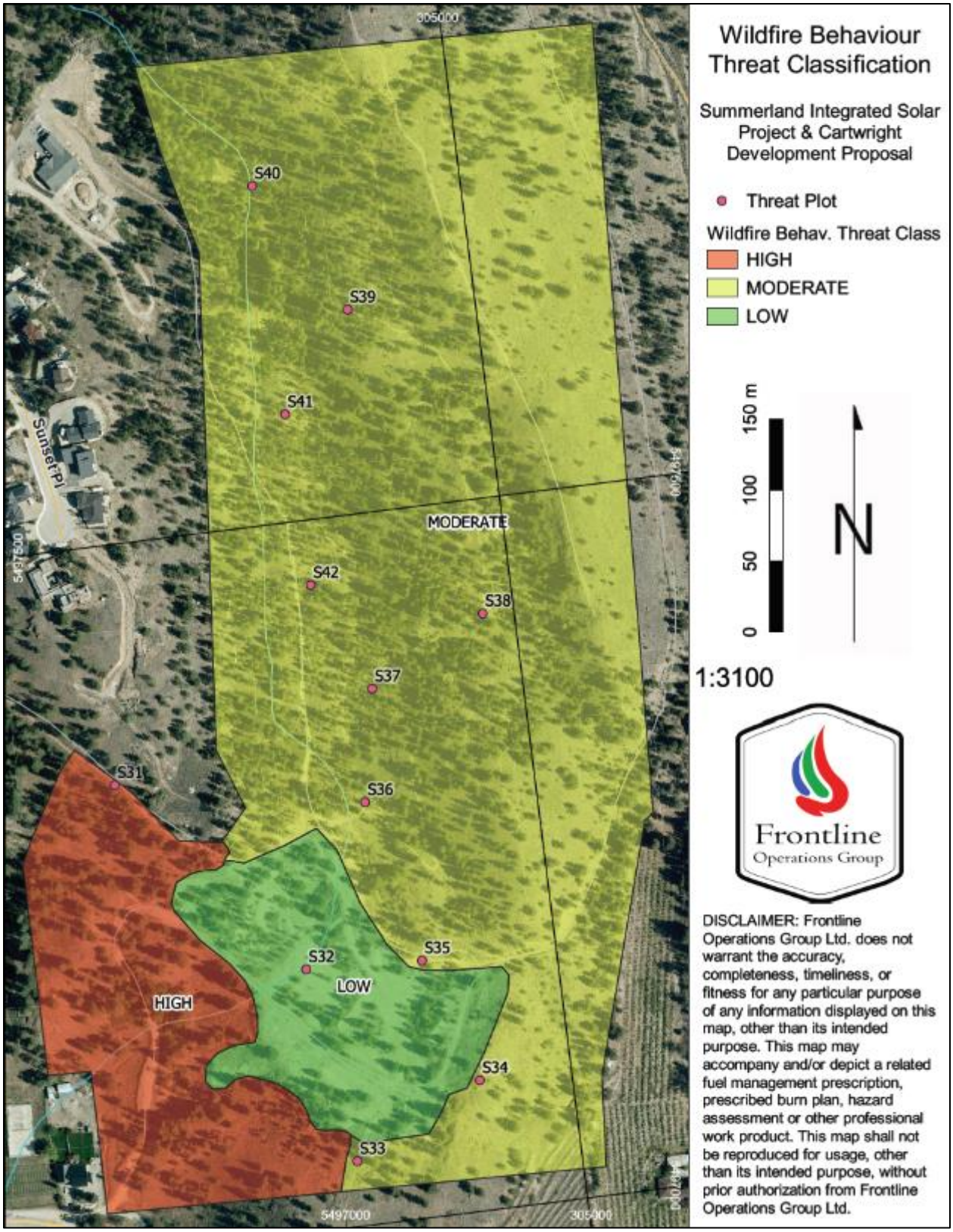

Figure 15 Wildfire Behaviour Threat Class map of the subject properties.

Discussion

This report addresses wildfire hazard and mitigation in relation to two different potential developments that are adjacent to each other (solar energy capture/storage and a residential area). As the land use differences between these two projects are significant, the following discussion will address the two project scopes separately.

Scope A – Integrated Solar Project

The approximate site boundaries of the solar project, as provided to Frontline, lie predominantly within the Low threat area (Figure 16). The Low threat classification is attributed to the site history and current state as a brownfield gravel pit. Specifically, the sparseness or absence of surface fuels (e.g., grass and needle loading) and the scattered and relatively juvenile Ponderosa pine in-fill – with an absence of coarse woody debris and fine fuel accumulations – result in fairly benign fire behaviour potential.

Recognizing that the site will change through the course of constructing the solar facility, it will be critical to consider the future vegetation state in and amongst the solar panels and related infrastructure. For example, if natural grasses are re-established on the site in proximity to the infrastructure, fuel connectivity into the site could be problematic, to the extent that surface fire could impinge on the site infrastructure. Consideration should therefore be given to the surface vegetation or materials that will be established or placed under the solar panels, and the height of the panels above the ground.

Maintaining separation between the solar infrastructure and adjacent fuel will be important, and this could be achieved in a number of ways. This may include simply not permitting the establishment of flammable vegetation by laying down crushed rock and periodically removing vegetation that attempts to establish within it. A more maintenance-intensive solution that permits natural surface vegetation to grow amongst the solar infrastructure could involve active management to control vegetation height and density.

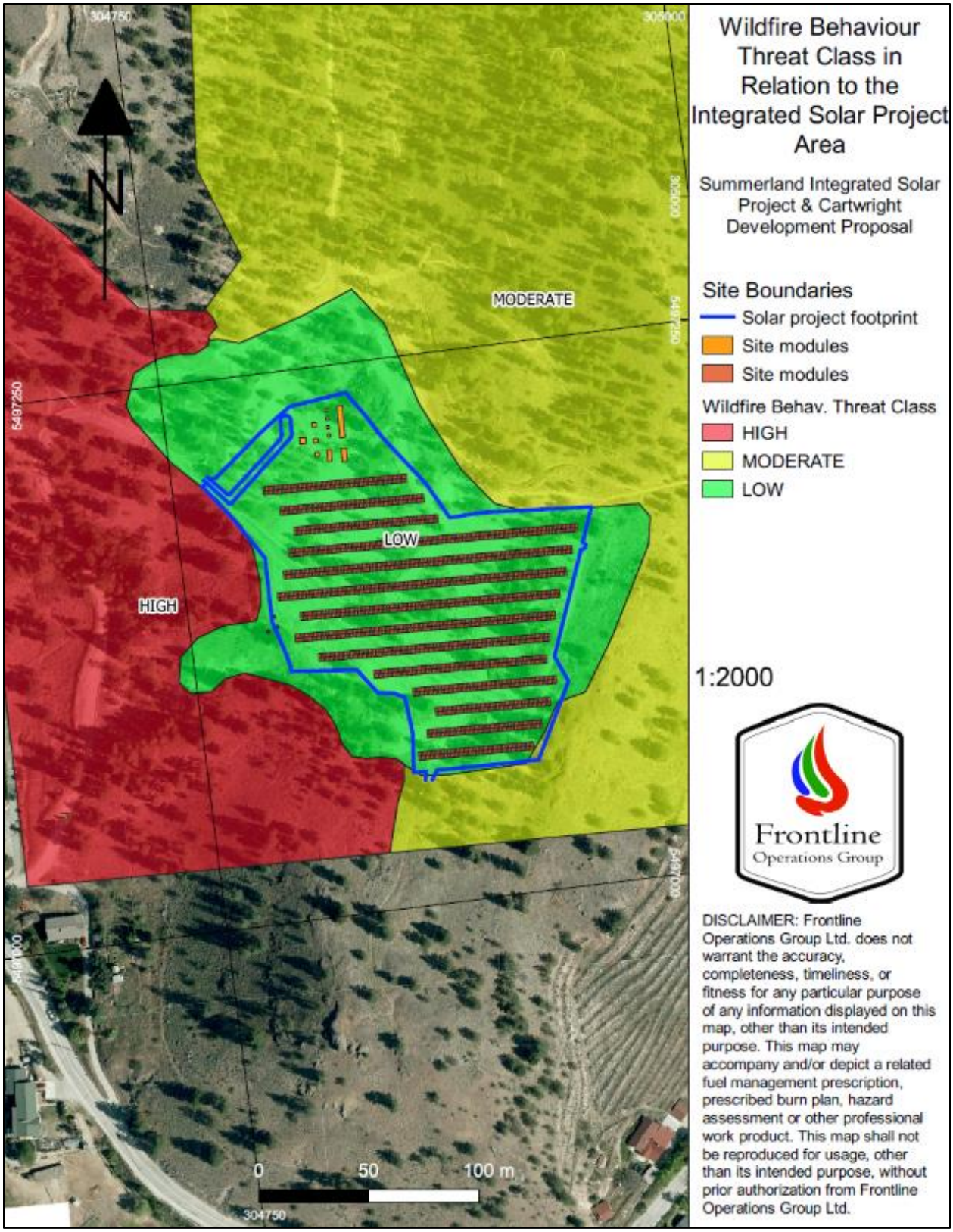

Figure 16 The proposed solar project lies predominantly within the Low Wildfire Behaviour Threat Class area.

Scope B – Cartwright Development

The majority of the approximate site boundaries of the Cartwright development project, as provided to Frontline, lie within the Moderate threat area (see Figure 17). Portions of the boundary extend into the solar project footprint (Low threat area) and the High threat area in the southwest corner. The two proposed access corridors from Ottley Avenue and Prairie Valley Road both traverse through the High threat area. The majority of the development area that is proposed for residential use lies within a previous fuel reduction treatment area.

Increasingly, research and post-fire disaster reviews (e.g., Cohen & Saveland, 1997) are indicating that the most important factors that influence the survivability of a structure during a WUI fire are a structure's characteristics and its immediate surroundings (Cohen, 2000) (Blanchi & Leonard, 2008) (Cohen, 2008) (Westhaver, 2017). During high-intensity crown fire experiments in the Northwest Territories (Cohen & Butler, 1998), findings indicated that at distances of 30m or more between a wood paneled structure and adjacent high-intensity crown fire in a C-2 fuel type, there was insufficient radiant heat to ignite the structure. In fact, Butler and Cohen (1998) found that the critical distance for sufficient radiant heat transfer to ignite a structure may only be 10m, however they concluded that a 30m distance would incorporate a conservative margin.

It is important to point out the differences in fuel type between the Butler and Cohen crown fire experiments (C-2 Black Spruce) and the fuel type described in this assessment (C-7 Ponderosa Pine/Douglas-fir), because these two fuel types have different fire behaviour characteristics. Stand structure is considerably different, whereby C-2 fuel has greater vertical continuity (i.e., ladder fuels (branches etc.) that extend down to the forest floor) and C-7 typically has less vertical continuity. Vertical continuity has a direct relationship to the probability of crown fire initiation – crown fires are more probable and occur at a much lower threshold in C-2 fuel types than in C-7.

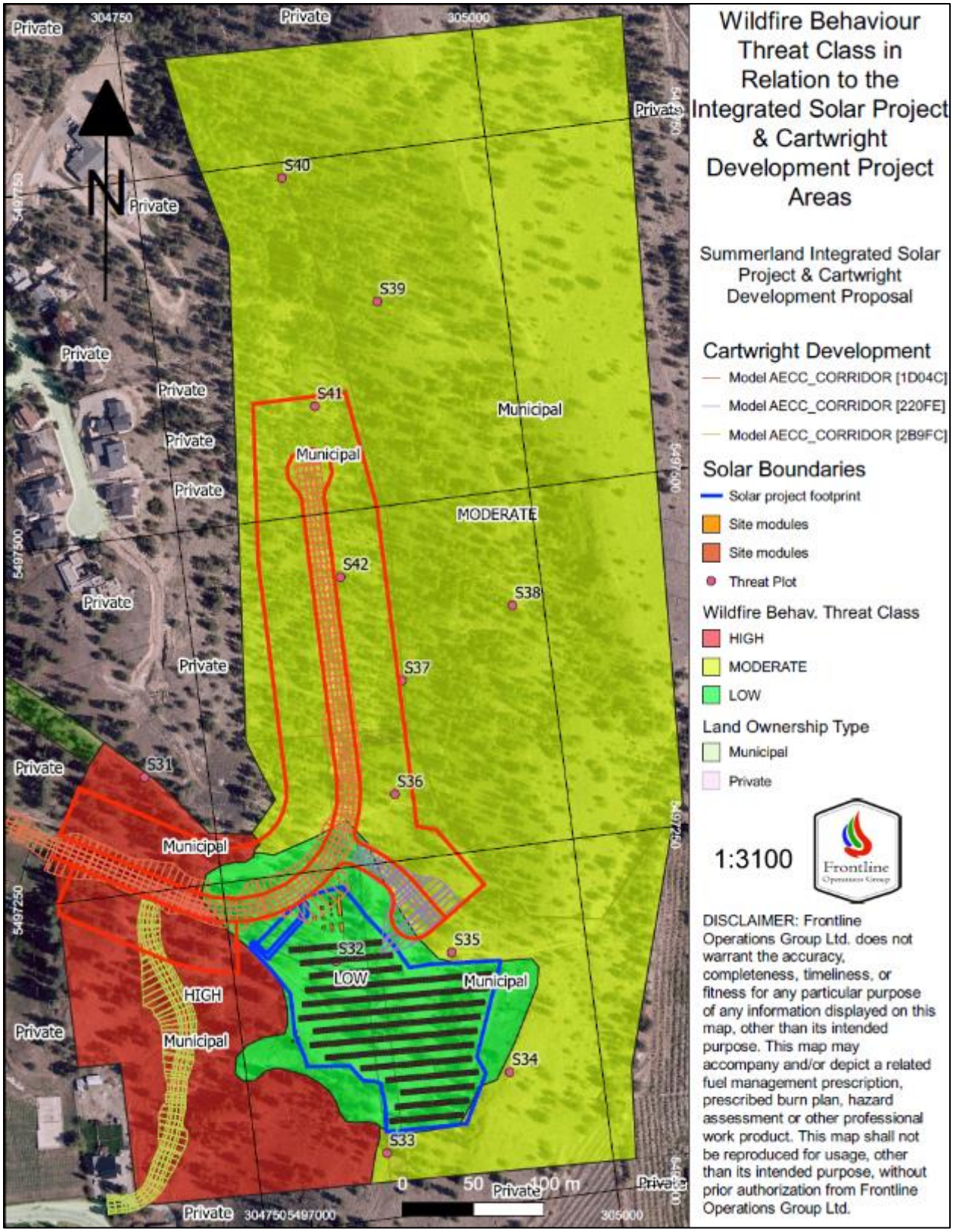

Figure 17 The majority of the proposed Cartwright development lies within the Moderate Wildfire Behaviour Threat Class area.

Of particular importance to the ignitability of a structure is its resilience to embers accumulating on or in the structure itself, or onto combustible material immediately adjacent to the structure (Blanchi & Leonard, 2008) (Calkin, et al., 2014) (Moritz, et al., 2014). Wood roofs, wood decks, stacked firewood, certain landscaping materials and plants, unscreened openings into a structure etc. can all be ideal locations for the accumulation of embers during a wildfire. These embers can in turn ignite the structure itself, likely leading to the destruction of the structure.

Direct flame contact on a structure is another important factor in structure survivability during a wildfire. Effectively "disconnecting" structures from the surrounding fuels is an important hazard mitigation measure. This includes ensuring that improvements, such as wooden fences or sheds, do not act as a pathway for fire to transfer from wildland fuels (such as cured grass) onto a nearby or connected structure. Commonly used landscaping materials and plants, such as bark mulch, ornamental cedar hedges and junipers, can also facilitate direct flame contact on a structure if used near the structure itself.

The FireSmart program[4] offers proven guidance on the design, retrofit, or ongoing maintenance to mitigate wildfire threats to buildings and property. The combination of adequate non-combustible and defensible space (Figure 18) around a structure that is built with fire resistant roofing and cladding and has openings into the building envelope properly screened to prevent ember accumulation are foundational principles of FireSmart and improve the survivability of structures in the wildland urban interface.

Recognizing that access corridors and building sites will need to be cleared off in order to facilitate construction, there is an assumption that most or all of the Zone 1 areas (see Figure 18 for reference) of the residential areas will be cleared of vegetation. Beyond Zone 1 (i.e., Zone 2 and 3) to the east of the residential development, prior fuel

[4] See FireSmart BC (https://firesmartbc.ca/) and FireSmart Canada (https://firesmartcanada.ca/) for additional information, guides, and resources.

reduction treatments have already been completed, reducing the threat classification to Moderate. A Moderate threat class through this area is likely the best mitigation that can be hoped for, if the management objective includes the preservation of the natural aesthetics of the surrounding area. Further lowering the threat classification would require converting the site to attributes similar to the Low threat area, which would be a significant change to the look and feel of the area and should be unnecessary provided that the residential structures and properties are built and maintained to FireSmart standards.

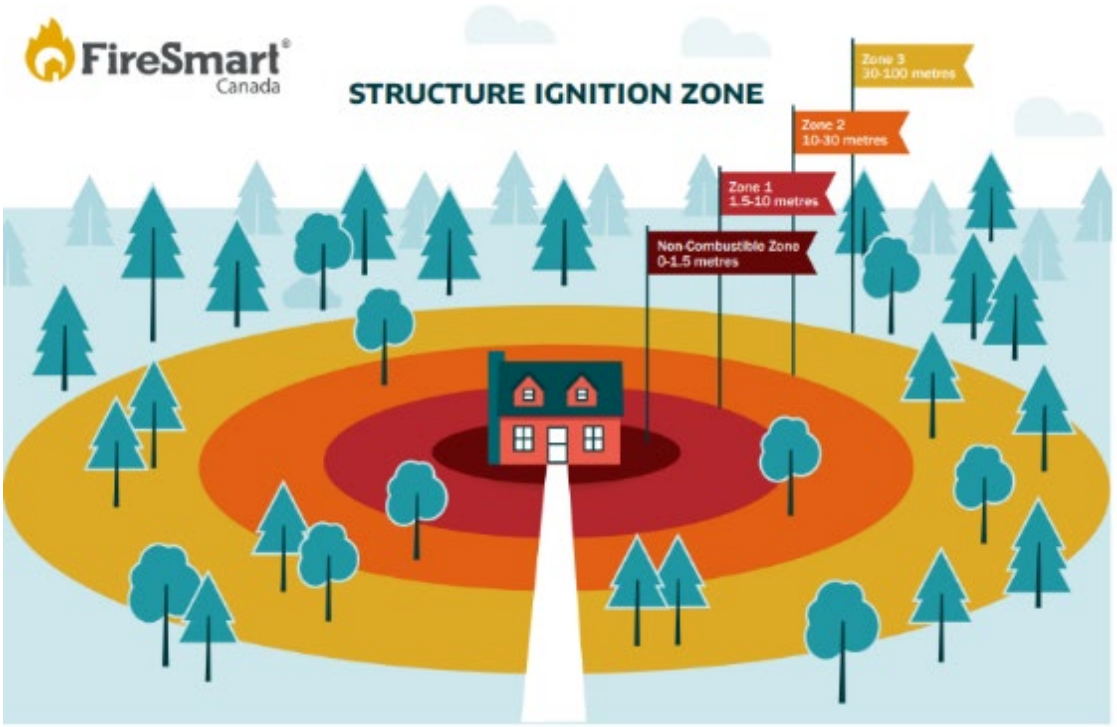

Figure 18 The FireSmart structure ignition zone provides a straightforward conceptual model of managing structure ignition potential. Graphic courtesy of FireSmartBC (https://firesmartbc.ca).

Recommendations

Upon assessment of the site and analysis of the fire behaviour, fire history and Wildfire Hazard Development Permit requirements, the following mitigation recommendations are provided. These recommendations should be considered during development planning and/or as part of a building and landscaping scheme. Some or all of the

recommendations may be incorporated into a restrictive covenant(s) for development properties. The recommendations are as follow:

Scope A – Integrated Solar Project

	Recommendation
A-1	Establish and maintain less-flammable ground cover around and underneath solar panels, to the following minimum specifications: • A less-flammable buffer of 3m should extend around the perimeter of the solar array area, between the array and the surrounding fence. This buffer should prevent or limit the potential for a wildfire to burn into the solar array area. This buffer could be achieved through a combination of methods, including the effect of access roads or trails, periodic mowing to keep grass shorter during fire season, irrigation, plant selection etc. • If vegetation is established around and/or under the solar panels, this vegetation should be able to stay green throughout the summer (i.e. it does not enter dormancy or senescence during the summer). The intent should be to limit the potential of a fire carrying through the vegetation and potentially damaging the solar array. This can be achieved through any number of means, including irrigation, plant selection, shade availability, creating discontinuity through the use of pathways or trails etc.
A-2	Establish and maintain a non-combustible zone around related solar infrastructure, to the following minimum specifications: • Non-combustible zone should adhere to FireSmart standards, including extending a minimum distance of 1.5 m from a structure and be comprised of non-combustible vegetation and/or material.

A-3	Ensure that the Summerland Fire Department Fire Chief is consulted regarding special firefighting and/or emergency response requirements or considerations that might necessitate an expansion of the areas described in recommendations A-1 and A-2.

Scope B – Cartwright Development

B-1	Ensure that all structures have an established and maintained non-combustible zone that surrounds each structure and is a minimum of 1.5 m wide and with the following specifications: • Non-combustible zone should adhere to FireSmart standards, including extending a minimum distance of 1.5 m from a structure and be comprised of non-combustible vegetation and/or material.
B-2	Within Zone 1 (1.5m to 10m from each structure), ensure that the following standards are met and maintained: • do not plant any of the following: o any member of the Cupressaceae family, including arborvitaes (cedar), and juniper; o any ornamental or non-native conifer tree or shrub; o ornamental grasses that exceed 1m in height; o deciduous plants with waxy, resinous foliage. • Refer to current FireSmart guidelines for specific plant recommendations.
B-3	Structures should incorporate the following building materials and/or finishes: • Class A roof assembly;

	• Fire resistant exterior cladding; • Heavy timber or fire-resistant cladding for structural components of any decks, balconies, and porches; • No use of exposed wooden materials on horizontal surfaces that are receptive to embers (porches, deck, roof, etc.). • Chimneys for wood burning appliances are screened with 12mm non-corrosive metal mesh; • Window glazing should be double paned or tempered; • All vents and similar openings are screened with 3mm non-corrosive non-combustible metal mesh; • Porches and decks are screened or sheathed to FireSmart recommended standards to prevent the accumulation of combustible debris and to prevent the accumulation of embers.
B-4	The following periodic maintenance activities are recommended for homes and properties: • Remove dead or dying vegetation promptly; • Remove vegetative debris (e.g., conifer needles) from roof assemblies and gutters; • Remove vegetative debris accumulations from porches, decks, or anywhere within the non-combustible zone; • Remove pruning debris and other yard waste promptly for off-site disposal;
B-5	The following best practices are recommended: • Do not store firewood or building materials within Zone 1; • Do not attach wood fences and/or gates to any portion of a structure; • Do not use bark mulch or any other flammable ground cover within Zone 1;

	• Do not dump yard waste on adjacent vacant property.

Scope A and B

AB-1	A fuel management treatment should be prescribed and undertaken on the area that has been classified with a High Wildfire Behaviour Threat Class, with the following considerations: • Treatment should be completed prior to residential occupation, at the latest; • The treatment prescription should address the following: o Thin out the smallest diameter conifers; o Prune residual conifers to 3m; o Remove treatment debris or pile and burn.

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