BUSHFIRE ASSESSMENT REPORT

9 VALLEY CLOSE, THREDBO

Lot 619 DP 1118588

Special Fire Protection Purpose Development

Prepared for Collins Pennington Architects

Ref: JD.109.21

ember bushfire consulting

June 10, 2021

1 INTRODUCTION

1.1 OVERVIEW

EMBER Bushfire Consulting has been engaged by Collins Pennington Architects to prepare a bushfire assessment report for the construction of a new lodge at 9 Valley Close, Thredbo (the Subject Site).

The Subject Site has an existing lodge, constructed in the early 1980's as part of the "Woodridge" development, which is in a declining state of repair. The owners are seeking to demolish the structure and rebuild with a new, contemporary lodge.

The development proposal is located on land that is declared bushfire prone and as a result is subject to Section 4.46 of the Environmental Planning and Assessment Act (1979) (EP&A Act) and Section 100B of the Rural Fires Act (1997).

Under the EP&A Act the development proposal must be shown to conform with the broad aims and objectives of the NSW RFS document Planning for Bushfire Protection (2019) (PBP 2019). PBP 2019 is the key reference document for this assessment.

This development is considered to be an "Alpine Resort" by PBP 2019 and as a result is subject to Section 6 - Special Fire Protection Purpose (SFPP) development.

It is important to note that at the time of development, Woodridge and the structures constructed within were not subject to any bushfire planning or construction regulation. As such factors like building setbacks and construction rating are deficient by today's standards and present significant challenges for the planning and construction of the new lodge.

Given the close proximity of the Subject Site to vegetation in the adjacent Kosciusko National Park, the threat of significant bushfire attack remains extreme and cannot be reasonably altered. Given modern construction standards (AS3959) however the level of resilience and survivability of the future lodge can be significantly improved when compared to the existing lodge.

Furthermore, with the provision of defendable space, reticulated water supplies and a more resilient structure makes for a more defendable asset from a firefighting operations perspective. Occupant safety is addressed through long standing and stringent bushfire emergency management practices implemented at Thredbo Village which were most recently tested during the 2019/20 bushfire season.

Based on the bushfire assessment and the recommendations contained in this report the proposed development is capable of complying with the broad objectives of PBP 2019 and therefore suitable for development approval.

1.2 AIM AND OBJECTIVES

The aim of this report is to:

- Evaluate the potential bushfire threat to the subject site, and
- Assess the capacity of the proposed development as planned to provide the protection measures necessary to offer life safety to the occupants, improve property protection and facilitates fire service intervention during a bushfire event.

The specific objectives expected of the proposed development is detailed in Chapter 6.6 – Special Fire Protection Purpose Developments (Alpine Resorts) PBP 2019.

The specific objectives for SFPP developments are to:

- provide an appropriate defendable space;
- provide a better bush fire protection outcome for existing structures (e.g. via ember protection measures);
- ensure new building work complies with the construction standards set out in AS 3959;
- to ensure ongoing management and maintenance responsibilities are in place where APZs are proposed outside of the sub lease or leasehold area;
- written consent from the land managers is provided for all proposed works outside of the sub lease or leasehold area;
- proposed APZs outside of the sub lease or leasehold area are supported by a suitable legal mechanism to ensure APZs are managed under a binding legal agreement in perpetuity;
- ensure building design and construction standards enhance the chances of occupant and building survival; and provide safe emergency evacuation procedures.

Any additional construction requirements should be commensurate with the following:

- the scope of the proposed works, including any increase in size and footprint of the building;
- any additional capacity for the accommodation of guests and/or staff on site; and
- the cost associated with the proposed upgrade of any building.

Accordingly, the following bushfire protection measures are to be assessed:

- Asset Protection Zones (APZs), and Landscaping,
- Construction Standards,
- Access,
- Services (water and utility services), and
- Emergency management.

The NSW RFS has an expectation that a better bush fire outcome is achieved where new development is proposed in association with existing facilities.

Report Details	
Report number:	Thredbo.SFPP.Redwin.JD.109.21
Report version:	1.1
Site assessment date:	19.3.21
Report date:	10.6.21
Site Details	
Client:	Andrew and Justine Redwin C/- Collins Pennington Architects
Subject lot details:	Lot 619 DP 1118588
Address:	9 Valley Close Thredbo
LGA:	Snowy Mountain Regional Council
Proposed works:	New Lodge (Tourist Accommodation)
Type of assessment	100B – Bush Fire Safety Authority - SFPP
PBP 2019 application type	SFPP – Alpine Resorts
Zoning of subject land	E1 – National Parks and Nature Reserves
Zoning of adjoining land	E1 – National Parks and Nature Reserves
Practitioner Details	
Bushfire practitioner:	Jeff Dau
Accreditation number:	BPAD - 33128
Accreditation expiry:	May 2022
Signature:	
Date:	10.6.21

1.3 LIMITATIONS AND DISCLAIMER

This report is primarily concerned with assessing the capacity of the proposed development to withstand the impacts of a bushfire, including ember attack, radiant heat exposure and flame contact.

Where necessary protection measures will be recommended to provide a level of protection to the occupants and the structures themselves.

It should be kept in mind that the measures recommended cannot guarantee the proposed development will survive a bushfire event on every occasion. This is primarily due to the dependence on ongoing vegetation management, the unpredictable behaviour of fire, and extreme weather conditions.

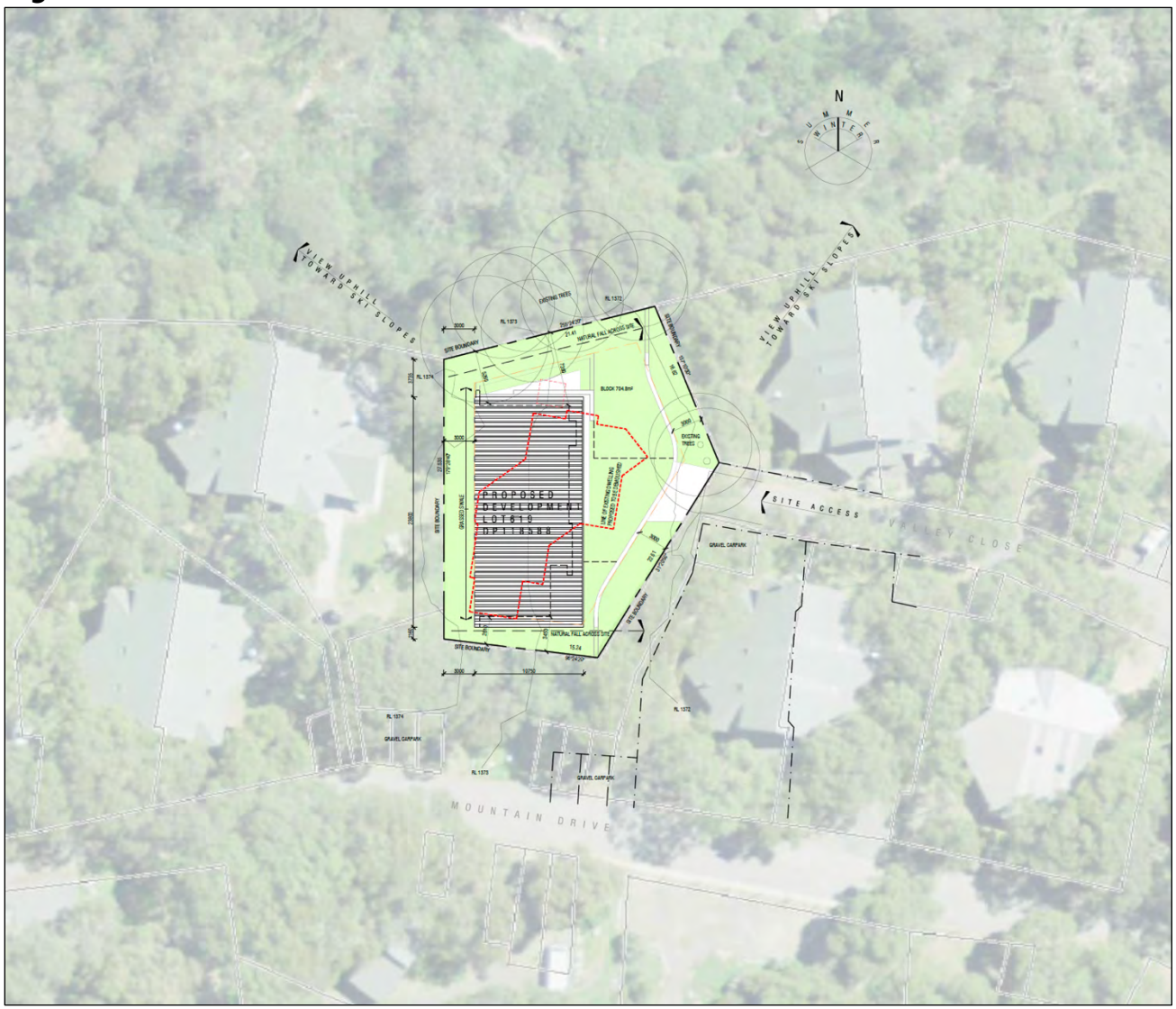
EMBER Bushfire Consulting has prepared this report with all reasonable diligence. The information contained in this report has been gathered from field investigations of the site as well as plans provided by the building designer and discussions held with the property owner.

1.4 SUBJECT SITE LOCATION

Figure 2 – Regional context of subject site (Apple Maps, 2021)

Figure 1 – Local context of subject site (FPAA Fire Maps, 2021)

1.5 THE DEVELOPMENT PROPOSAL



The development proposal is to demolish the existing lodge and construct a new lodge (knockdown / rebuild).

The new lodge will include:

- BAL-FZ Construction.
- Simple roof design.
- Sub-floor.
- Double car garage.
- 4 Bedrooms.
- Open plan living areas.
- Large outdoor terrace.

Note:

- Occupancy numbers to remain the same as existing lodge.
- Building footprint and proximity to hazard remains approximately the same as the existing lodge.

Figure 3 - Proposed lodge site plan. Red outline indicates existing lodge footprint (Collins Pennington Architects, 2021)

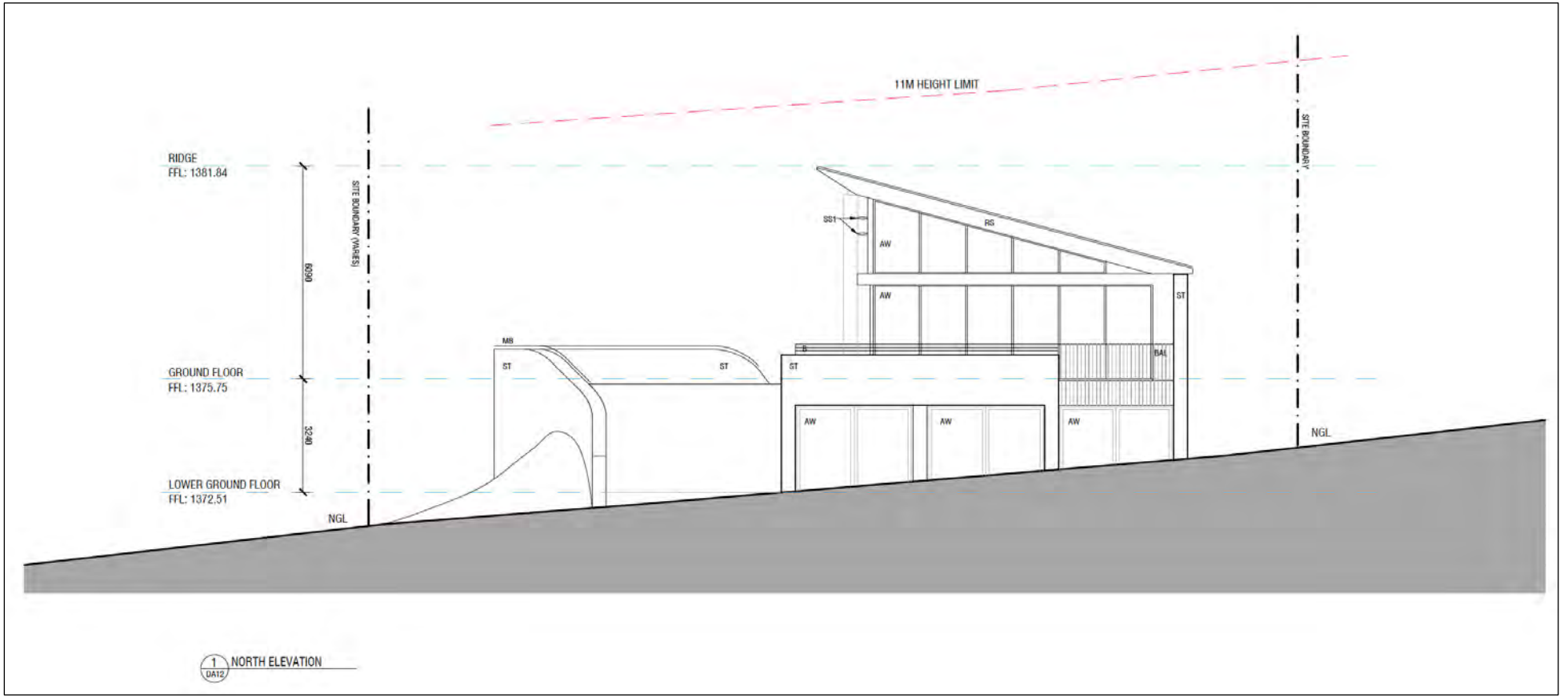


Figure 4 – Proposed lodge northern elevation (Collins Pennington Architects, 2021)

Figure 5 - Proposed lodge lower floor plan. Red outline indicates existing lodge footprint (Collins Pennington Architects, 2021)

2 BUSHFIRE THREAT ANALYSIS

2.1 METHODOLOGY

The methodology adopted by this report is as follows:

Table 1 - Report methodology

Method	Task	Considerations
Desktop analysis	Review available mapping resources, policy documents & development plans	Online Maps Development Control Plans Local Environmental Plan
Site inspection	Evaluate context of site, determine bushfire threat, options for asset protection zones, access roads and infrastructure.	Ground truth online mapping data, validate vegetation class, obtain site measurements, assess existing structures and infrastructure.
Assessment of proposal against the NSWRFS Planning for Bushfire Protection (PBP 2019).	Assess the development proposal against the performance criteria of PBP 2019.	Does the proposal comply with the acceptable solutions provided under of PBP 2019.
Report	Preparation and publication of bushfire assessment report	Demonstrate the proposal is capable of meeting the aims and objectives of PBP 2019.

2.2 BUSHFIRE ENVIRONMENT

To determine the potential bushfire threat posed to the subject site, the following environmental factors are adopted across the site.

Table 2 - Bushfire behaviour factors

Factor	Value
Fire Weather Area	Alpine Areas
FDI	50 (Adjusted to FDI 100 for SFPP)
Predominant Vegetation Classification	Sub-Alpine Woodland
Slope	0-5 deg downslope.

Note: A detailed bushfire hazard analysis is detailed below.

Note:

- *Vegetation formations within 140 m of the subject site were identified and classified in accordance with Appendix A1.2 of PBP 2019.*
- *Slopes within 100 m of the APZ have been calculated in accordance with A1.4 & A1.5 of PBP 2019.*
- *The fire danger index for the site has been determined in accordance with the NSW Rural Fire Service.*
- *A detailed bushfire threat analysis is provided in Section 3 of this report.*

2.3 SUBJECT SITE BUSHFIRE PRONE MAPPING

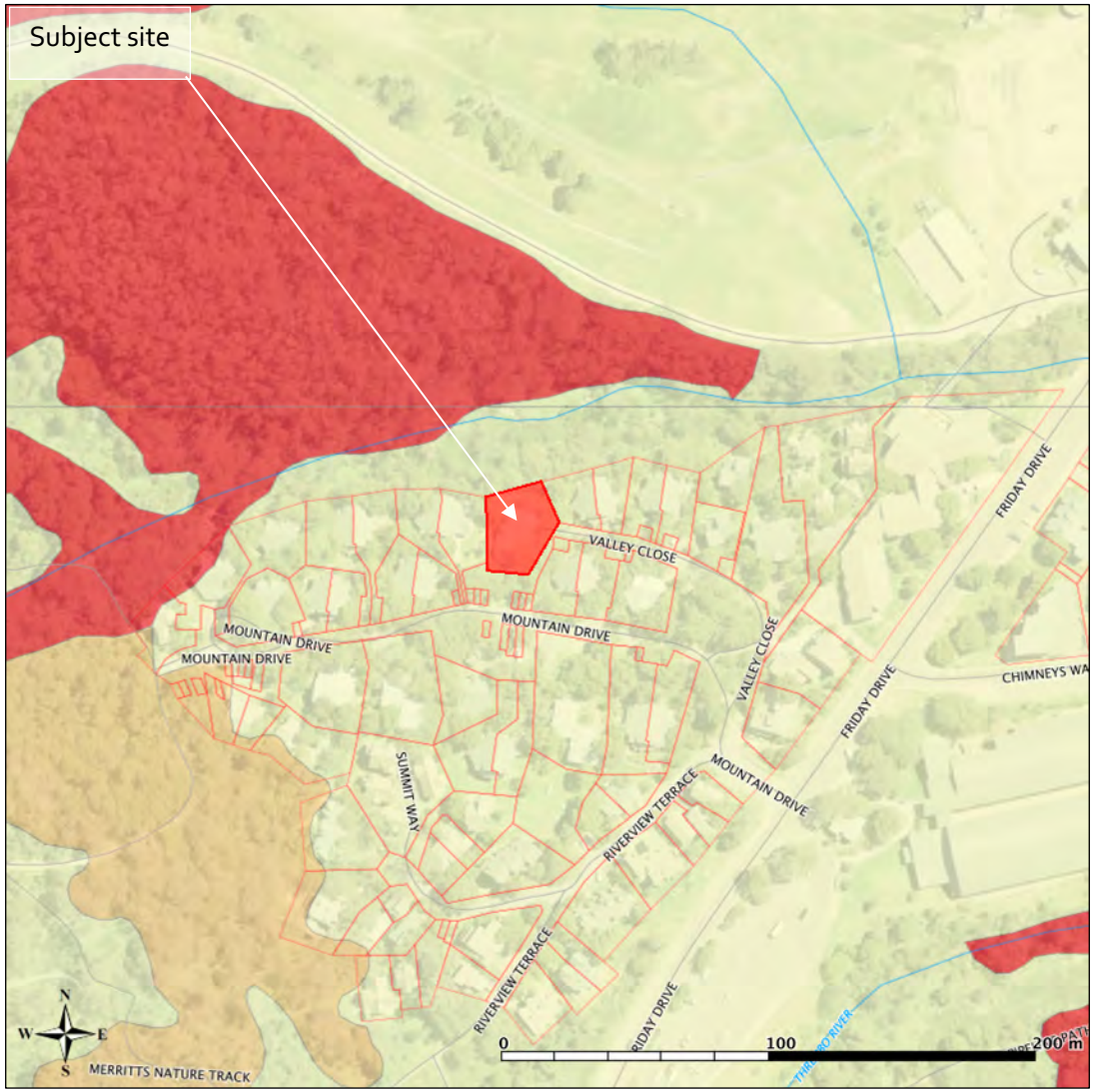


Figure 6 – Subject site bushfire prone land map. (FPAA Fire Maps, 2021)

Bushfire prone mapping relative to the subject site (Figure 5) showing the subject site adjacent to areas of Category 1 Vegetation as identified by Council and NSW RFS.

Note: The mapping does not take into account land use changes, i.e. recent development in the area which may alter the validity of the mapping as it is currently published.

2.4 SUBJECT SITE VEGETATION FORMATIONS (BROADSCALE)

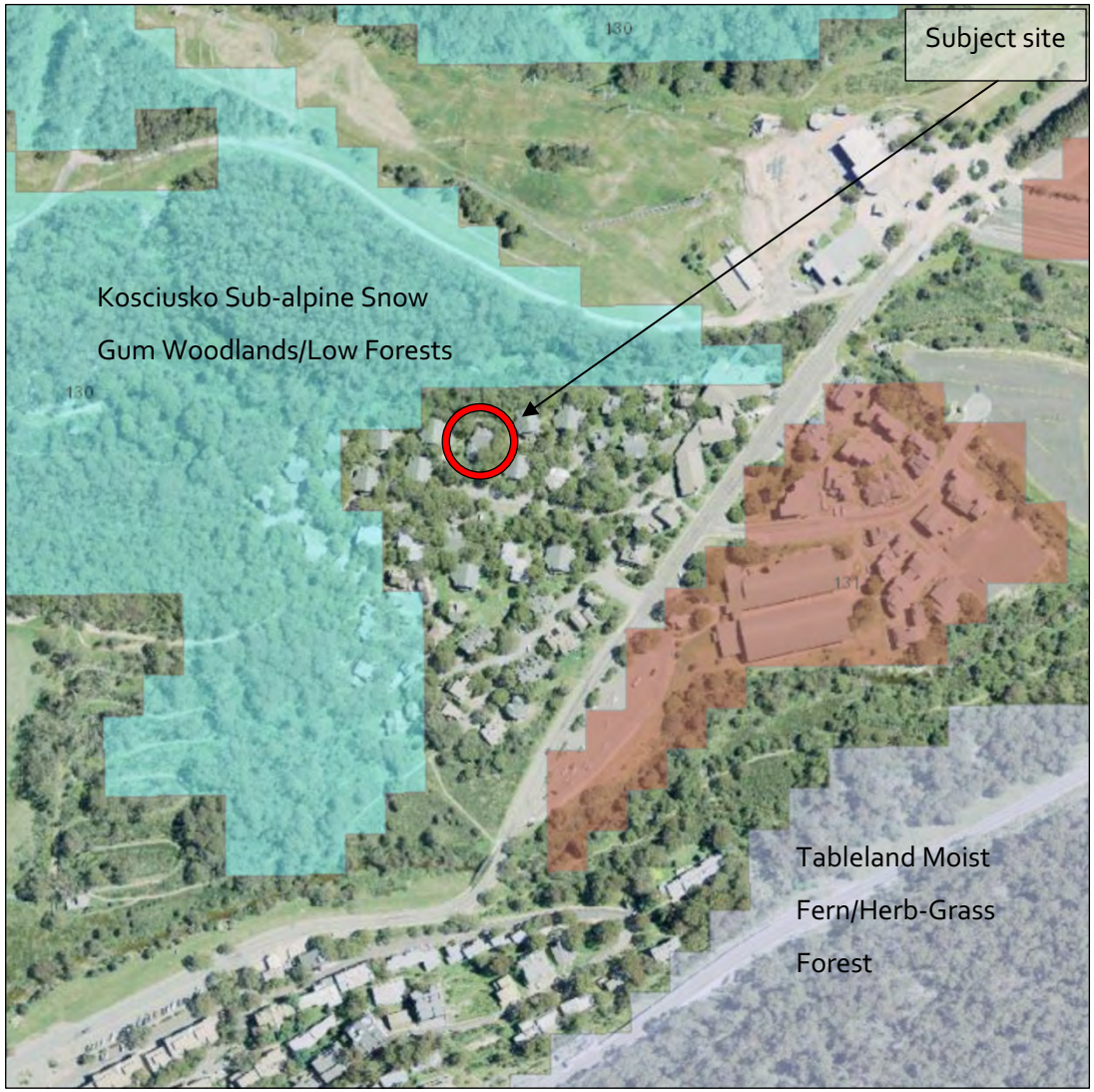


Figure 7 – Subject site vegetation classification. (Seed, 2021)

Subject site vegetation formations as defined by SEED – Vegetation Map - Southern Forests – VIS 3858

Vegetation mapping indicates that the subject site is broadly influenced by Sub-Alpine Low Forests.

2.5 HAZARD, APZ AND ACCESS ASSESSMENT

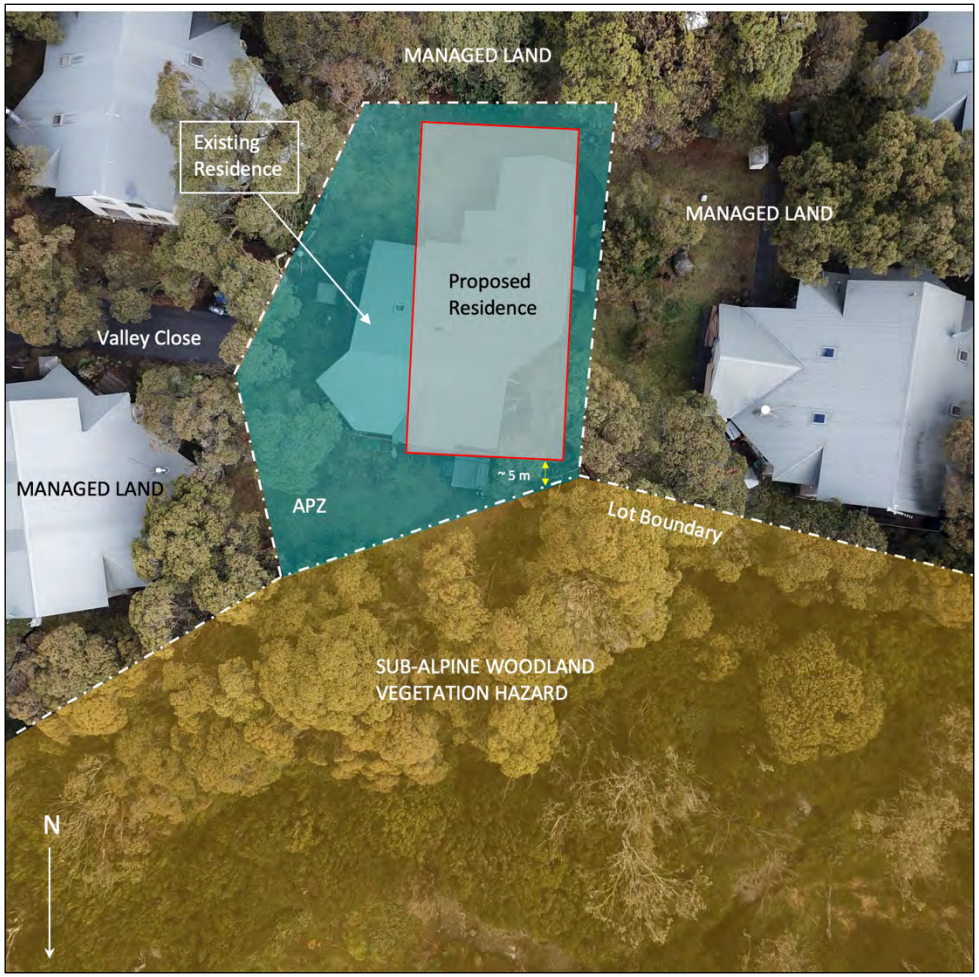


Figure 8 - Showing subject site, location of proposed lodge, available APZ, setback dimensions to classified vegetation formations. Indicative only. (Dau, 2021)

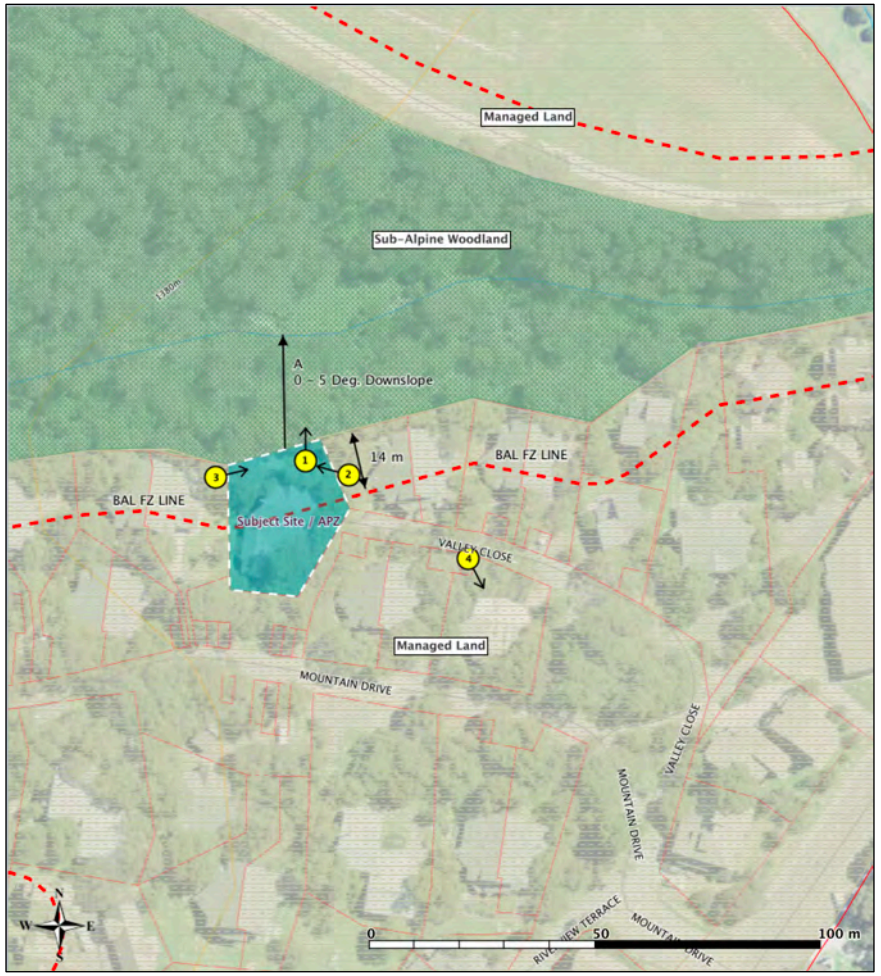


Figure 9 – Showing subject site slope and BAL analysis and photo points provided below (FPAA Fire Maps, 2021)

2.6 GROUND OVERVIEW OF SITE

Figure 10
Photo
Point 1

Figure 11
Photo
Point 2

Figure 12
Photo
Point 3

Figure 13
Photo
Point 4

2.7 BUSHFIRE THREAT ANALYSIS CONCLUSIONS

2.7.1 VEGETATION FORMATIONS

Vegetation formations within 140 m of the subject site were identified and classified in accordance with Appendix A1.2 of PBP (2019).

Aspect	Formation
North	Sub-Alpine Woodland
East	Managed Land
South	Managed Land
West	Managed Land

2.7.2 RELEVANT FIRE DANGER INDEX

The fire danger index for the site has been determined in accordance with the NSW Rural Fire Service.

NSW Fire Area	Fire Danger Index (FDI)
Alpine Area	50 (Adjusted to 100 for SFPP Developments)

2.7.3 SLOPE, APZ AND BUSHFIRE ATTACK LEVEL (BAL) ASSESSMENT

Site slope, APZs (currently available) were assessed. The resultant BAL ratings (Table 1) were determined in accordance with Table A1.12.7 of PBP (2019).

Table 3 - Slope assessment and BAL Table

Transect	Aspect	Vegetation Formation	Slope	Setback and APZ available	BAL
A	N	Sub-Alpine Woodland	0° – 5° downslope	5 m	BAL-FZ

2.7.4 ASSESSMENT NOTES

- The Subject Site fronts unleased E1 - National Parks and Nature Reserves Zoned land (Kosciusko National Park).
- The author and proponent met with a representative of NSW National Parks and Wildlife Service (Marion Battishall, Environmental Liaison Officer) 20th April 2021 to discuss matters relating to the current APZ and the potential for expanding the APZ into unleased land. Miss Battishall stated that due to the sensitive nature of this area (riparian zone), no support could be provided for expansion of the APZ.
- Miss Battishall did however provide support for the continued management of the existing APZ, including the removal of a number of trees adjacent the lodge which could be perceived as a fire risk. (Attachment C).
- The subject lot is physically constrained due to limited space. While some level of defendable space between the lodge and hazard can be provided there is insufficient room to provide an APZ in accordance with Table A1.12.1 Appendix 1.
- While the proposed building footprint largely occupies the same space the current lodge occupies, it will be marginally closer to the northern boundary (down to 5 m from the previous 7 m). Defendable space is still considered adequate.

3 BUSHFIRE PROTECTION MEASURES

In response to the bushfire threat analysis, a number of Bushfire Protection Measures (BPMs) are to be adopted in accordance with Section 6 – Special Fire Protection Purpose Developments (SFPP) – Alpine Resorts.

This specific objectives of these BPMs are provided in Section 1.2 of this report. The performance criteria from Section 6 – SFPP has been chosen as the benchmark for compliance purposes. A statement of compliance against the performance criteria and objectives of PBP 2019 is provided in Appendix A of this report.

3.1 ASSET PROTECTION ZONES (APZS) – PERFORMANCE BASED DESIGN

Considerations:

- The subject site forms part of an existing lodging precinct compromised of similar sized and managed lodges.
- The extent of hazard vegetation on the adjoining Kosciusko National Park remains consistent in density and slope.
- Being located adjacent to unmanaged hazard to the north, it is accepted that the precinct is highly vulnerable to potential bushfire attack.
- The close proximity of high hazard vegetation and narrow block dimensions places physical and practical constraints on designing a building of reasonable and functional size. In turn there is the inability to provide adequate setbacks for the proposed lodge and therefore APZ dimensions do not meet those required by PBP 2019 and resulting in a high BAL rating of BAL-FZ.
- A min. 5 m defendable space is provided between the lodge and the lot boundary to the north.

Discussion –:

At the time of design and planning, the "Woodridge" development did not provide adequate setbacks for lodges from hazard vegetation in the surrounding KNP. As a result, the subject site presents challenges in achieving the required APZs for SFPP developments set out in PBP 2019.

In lieu of achieving compliance with the acceptable solutions for APZs for SFPP development a performance-based solution is proposed which seeks a better bushfire protection outcome for the proposed Lodge over the existing one.

A better bush fire outcome approach acknowledges the site constraints but seeks overall improvement of the site once development is complete. This approach is recognised and called for in Section 6.6 Alpine Resorts of PBP 2019.

Recommendations:

- Existing APZ dimensions to remain unchanged.
- APZ to be maintained in accordance with Table 2.
- At the commencement of building works, and in perpetuity, all land within the subject lot is to be managed as IPA in accordance with the requirements of Asset Protection Zone Standards - Appendix 4 of PBP (2019) (Attachment B).
- As per email from NPWS (Attachment C) the trees adjacent the existing lodge are to be removed (pending written approval from Thredbo management).
- The proposed structure will be constructed to the highest level of protection BAL-FZ (See Construction).
- Access along the northern side of the proposed lodge is to remain totally clear of vegetation, or any material that is considered combustible or prevents clear access / egress for fire crews through this area.
- At least one fixed firefighting hose reel should be installed within the subject property and be of a min. length (36 m) so as to reach all areas, surrounding the proposed development and associated curtilage.
- The fire hose reels should be manufactured in accordance with the Australian/New Zealand Standard AS/NZS 1221:1997 'Fire hose reels' and installed in accordance with AS2441-2005 'Installation of fire hose reels'.
- Updated Bush Fire Emergency Management plans are to be provided that remain consistent with the overarching Thredbo Village Bush Fire Emergency Management Plan.

Table 4 - Required APZ dimensions to be maintained

Aspect	Proposed APZ
N	To lot boundary
E	To lot boundary
S	To lot boundary
W	To lot boundary

3.2 LANDSCAPING

Recommendations:

- All landscape within the area identified as APZ (Figure 8 & 9) is to be managed in perpetuity and in accordance with the requirements of Asset Protection Zone Standards - Appendix 4 of PBP (2019) (Attachment B).

3.3 CONSTRUCTION – PERFORMANCE BASED DESIGN

Discussion:

Given the inability to provide the appropriate APZs, the acceptable solution for construction (BAL-12.5) is not deemed appropriate. In order to satisfy the performance criteria for construction,

"the proposed building can withstand bush fire attack in the form of wind, embers, radiant heat and flame contact".

The following recommendations are made.

Recommendations:

- The proposed lodge shall incorporate:
    - Australian Standard AS3959-2018 'Construction of buildings in bushfire prone area' Sections 3 & 9 - BAL-FZ design / materials, and/or
    - NASH Standard (1.7.14 updated) 'National Standard Steel Framed Construction in Bushfire Areas' – 2014 as appropriate.
- Additional construction requirements to comply with Section 7.6 PBP 2019 provided here in Attachment B.

Conclusion:

Despite the BAL-FZ rating, when evaluating the level of safety provided by the proposed lodge to the future occupants (including guests), recognition should be given to the strict Emergency Management procedures applied by NPWS and NSW RFS to all residents and visitors within the Thredbo Village during a bushfire emergency. Lying within Kosciusko National Park, Thredbo Village is subject to strict emergency management procedures, such that would see the mandatory and highly coordinated evacuation of the Village as occurred on 2.1.20 during the 2019 / 2020 bushfire season (Attachment E). Despite the Flame Zone rating which is viewed as an extreme level of threat, given the strict emergency procedures applied to the Village the actual threat to life is less given that the future occupants would have been subject to an evacuation order. In the rare event that an evacuation hasn't taken place, an identified refuge is available within Thredbo Village.

The NSW RFS has an expectation that a better bush fire outcome is achieved where new development is proposed in association with existing facilities. The replacement of the existing lodge with a modern lodge that is –

- designed to withstand bushfire attack,
- provided with further clearing of the APZ,
- formalisation of APZ management,
- introduction of a fire hose reel, and
- revised emergency management planning.

provides for a redeveloped site that is significantly improved over the existing development from a bush fire protection perspective. On this basis the performance criteria for APZ's, landscaping and construction can be achieved by the proposed development through the application of PBP 2019 acceptable solutions including the adoption of a performance-based solution.

3.4 ACCESS REQUIREMENTS

Discussion:

- The proposed lodge will have direct access Valley Close (public road) approximately 13 m away, and
- Friday Drive (public through road) 170 m away.

Recommendations:

- Nil requirements.

3.5 WATER SUPPLIES

Discussion:

- The subject lot is served by existing reticulated water supplies including hydrants with the closest hydrant point ~33 m away.

Recommendations:

- At least one fixed firefighting hose and reel should be installed within the subject property and be of a min. length (36 m) so as to reach all areas, surrounding the proposed development and associated curtilage.
- The fire hose reels should be manufactured in accordance with the Australian/New Zealand Standard AS/NZS 1221:1997 'Fire hose reels' and installed in accordance with AS2441-2005 'Installation of fire hose reels'.

3.6 ELECTRICITY SERVICES

Discussion:

- The subject lot is served by existing underground electricity supplies.

Recommendations:

- Electrical services to be provided in accordance with Table 7.4a PBP 2019 detailed here in Attachment A.

3.7 GAS SERVICES

Discussion:

- There are no plans for gas supplies at the lodge.

Recommendations:

- Nil.

3.8 EMERGENCY MANAGEMENT

Recommendations:

- Updated Bush Fire Emergency Management plans are to be provided that remain consistent with the overarching Thredbo Village Bush Fire Emergency Management Plan.
- A bush fire emergency management and evacuation plan is to be prepared consistent with the NSW RFS document: "*A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan*",

and Australian Standard AS 3745:2010 "*Planning for emergencies in facilities*".

- The emergency and evacuation management plan should include a mechanism for the early relocation of the facility users.
- An Emergency Planning Committee is to be established to consult with NPWS and Thredbo Village Management.
- Detailed plans of all emergency assembly areas including on-site and off-site arrangements as stated in AS 3745:2010 are clearly displayed, and an annually emergency evacuation is conducted.

4 CONCLUSION

This report documents the findings from a bush fire protection assessment conducted on a proposed new lodge at 9 Valley Cl, Thredbo.

This report establishes the level of bushfire threat to the proposed development and examines the protection of the structure through measures such as asset protection, access, water supplies, landscaping, construction and emergency management.

The 2019 / 20 bushfire season has demonstrated that Thredbo is vulnerable to bushfires and given the presence of forest vegetation in close proximity to the subject site this threat will remain present for the life of the proposed lodge.

Although the subject site inherits constraints from a past planning system that did not take into account bushfire attack, there is good opportunity to provide a comprehensive range of bushfire protection measures that address the bushfire threat and the compliance requirements of PBP 2019.

APZs are not consistent with the dimensions deemed acceptable with PBP 2019 due to the physical and environmental constraints of the lot.

In order to address shortfalls in APZ dimensions, the maximum level of construction (BAL-FZ) is to be adopted by the lodge along with other protection measures including defendable space and cleared areas surrounding the lodge and a fire hose reel, to aid active firefighting and recognition of strong overarching emergency management procedures.

Access is well provided for and firefighting water supplies, electricity and gas services will all be capable of meeting the requirements of PBP 2019.

Based on the bushfire assessment and the recommendations contained in this report the proposed development is capable of:

- providing an appropriate defendable space;
- providing a better bush fire protection outcome for existing structures;
- ensure new building work complies with the construction standards set out in AS 3959;

- to ensure ongoing management and maintenance responsibilities are in place where APZs are proposed outside of the sub lease or leasehold area;
- written consent from the land managers is provided for all proposed works outside of the sub lease or leasehold area;
- proposed APZs outside of the sub lease or leasehold area are supported by a suitable legal mechanism to ensure APZs are managed under a binding legal agreement in perpetuity;
- ensure building design and construction standards enhance the chances of occupant and building survival; and
- provide safe emergency evacuation procedures.

Any additional construction requirements should be commensurate with the following:

- the scope of the proposed works, including any increase in size and footprint of the building;
- any additional capacity for the accommodation of guests and/or staff on site; and
- the cost associated with the proposed upgrade of any building.

The proposed development is deemed to comply with the broad objectives of PBP 2019 and therefore suitable for development approval.

Be advised that the NSWRFS may alter recommendations and/or impose additional conditions as it feels is necessary to offer further protection to the structures, occupants and fire fighters during a bush fire.

4.1 METHODOLOGY

- The methodology adopted for this assessment is based on the development proposal following a full Development Application (DA) process. On this basis Planning for Bushfire Protection (2019) and AS3959-2019 has been the reference document for the assessment.
- All distance and slope measurements were taken during an on-site survey of the block using a "Tru-Pulse 200" laser range finder and further validated using plans, data from NSW Spatial Services and Google Earth tools.
- Measurements taken were based on a site plan provided by Collins Pennington Architects.
- Aerial imagery captured with DJI drone and processed in Maps Made Easy.

4.2 REFERENCE

- Keith D. (2004) "Ocean Shores to Desert Dunes", Department of Environment and Conservation, Sydney.
- NSW Rural Fire Service. (2019) "Planning for Bushfire Protection". Sydney
- Standards Australia, (2018) "AS/NZS 3959-2009 Construction of buildings in bush fire prone areas."
- Six Maps, NSW Department of Finance and Services, accessed 10 May 2021, https://maps.six.nsw.gov.au/#
- ePlanning Spatial Viewer, Department of Planning Industry and Environment, accessed 10 May 2021, https://www.planningportal.nsw.gov.au/spatialviewer/#/find-a-property/address

ATTACHMENT A – STATEMENT OF COMPLIANCE

The following statement of compliance tables the performance criteria to be met by the proposed development under PBP 2019. The table also identifies which avenue is used to achieve compliance, details of the acceptable solution and specific information on the how this is achieved for the proposed development.

Performance Criteria for Infill Development:

Performance Criteria	Method of Compliance	Acceptable Solution	Comments / Details
ASSET PROTECTION ZONES			
• radiant heat levels of greater than 10kW/m^2 (calculated at 1200K) will not be experienced on any part of the building.	Proposed Alternative Solution.	• the building is provided with an APZ in accordance with Table A1.12.1 in Appendix 1.	At the time of design and planning, the "Woodridge" development did not provide adequate setbacks for lodges from hazard vegetation in the surrounding KNP. As a result, the subject site presents challenges in achieving the required APZs for SFPP developments set out in PBP 2019. In lieu of achieving compliance with the acceptable solutions for APZs for SFPP development a performance-based solution is proposed which seeks a better bushfire protection outcome for the proposed Lodge over the existing one. A better bush fire outcome approach acknowledges the site constraints but seeks overall improvement of the site once development is complete. This approach is recognised and called for in Section 6.6 Alpine Resorts of PBP 2019.
• APZs are managed and maintained to prevent the spread of a fire towards the building.	Will meet the acceptable solutions.	• the APZ is managed in accordance with the requirements of Appendix 4 of this document and is wholly within the boundaries of the development site.	Landscaping within the APZ is required to be managed as an IPA in accordance with the principles provided Appendix 4 – Asset Protection Zone Standards, PBP 2019 which is provided in Attachment B of this report.

Performance Criteria	Method of Compliance	Acceptable Solution	Comments / Details
• The APZs is provided in perpetuity.	Will meet the acceptable solutions.	• APZs are wholly within the boundaries of the development site; and • other structures located within the APZ need to be located further than 6m from the refuge building.	All APZs are within the boundaries of the development site.
• APZ maintenance is practical, soil stability is not compromised and the potential for crown fires is minimised.	Will meet the acceptable solutions.	• APZs are located on lands with a slope less than 18 degrees.	No land within the area identified as APZ (Figure 9) is over 18°.
LANDSCAPING			
• Landscaping is designed and managed to minimise flame contact and radiant heat to buildings, and the potential for wind-driven embers to cause ignitions.	Will meet the acceptable solutions.	• landscaping is in accordance with Appendix 4; and • fencing is constructed in accordance with section 7.6 of PBP 2019.	Landscaping within the APZ is required to be managed as an IPA in accordance with the principles provided Appendix 4 – Asset Protection Zone Standards, PBP 2019 which is provided in Attachment B of this report.
CONSTRUCTION			
• the proposed building can withstand bush fire attack in the form of wind, embers, radiant heat and flame contact.	Proposed Alternative Solution.	• a construction level of BAL-12.5 under AS 3959 or NASH Standard and section 7.5 of PBP is applied.	Given the inability to provide the appropriate APZs, the acceptable solution for construction (BAL-12.5) is not deemed appropriate. In order to satisfy the performance criteria for construction, *t*he following recommendations are made. <u>Recommendations:</u> • The proposed lodge shall incorporate: ○ Australian Standard AS3959-2018 'Construction of buildings in bushfire prone area' Sections 3 & 9 - BAL-FZ design / materials, and/or ○ NASH Standard (1.7.14 updated) 'National Standard Steel Framed Construction in Bushfire

Performance Criteria	Method of Compliance	Acceptable Solution	Comments / Details
			Areas' – 2014 as appropriate. • Additional construction requirements to comply with Section 7.6 PBP 2019 provided here in Attachment B.
ACCESS			
• Firefighting vehicles are provided with safe, all-weather access to structures.	Will meet the acceptable solutions.	• SFPP access roads are two-wheel drive, all-weather roads; • access is provided to all structures; • traffic management devices are constructed to not prohibit access by emergency services vehicles; • access roads must provide suitable turning areas in accordance with Appendix 3; and • one way only public access roads are no less than 3.5 metres wide and have designated parking bays with hydrants located outside of these areas to ensure accessibility to reticulated water for fire suppression.	Property access specifications will be in accordance with the min requirements provided Property Access Table 6.8b.
• the capacity of access roads is adequate for firefighting vehicles.	Will meet the acceptable solutions.	• the capacity of perimeter and non-perimeter road surfaces and any bridges/causeways is sufficient to carry fully loaded fire fighting vehicles (up to 23 tonnes); bridges / causeways are to clearly indicate load rating.	The capacity of road surfaces and any bridges/causeways will be sufficient to carry fully loaded firefighting vehicles; bridges / causeways are not proposed.
• there is appropriate access to water supply.	Will meet the acceptable solutions.	• hydrants are located outside of parking reserves and road carriageways to ensure accessibility to reticulated water for fire suppression; • hydrants are provided in accordance with the relevant clauses of AS 2419.1:2005 - Fire hydrant installations System design, installation and commissioning; and • there is suitable access for a Category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available.	Access to a compliant reticulated water supply is provided.
PERIMETER ROADS			
• access roads are designed to allow safe access and egress for firefighting vehicles while residents are evacuating as well as providing a safe operational environment for emergency service personnel during firefighting and emergency management on the interface.	Will meet the acceptable solutions.	• are two-way sealed roads; • minimum 8m carriageway width kerb to kerb; • parking is provided outside of the carriageway width; • hydrants are located clear of parking areas; • are through roads, and these are linked to the internal road system at an interval of no greater than 500m;	Not applicable.

Performance Criteria	Method of Compliance	Acceptable Solution	Comments / Details
		• curves of roads have a minimum inner radius of 6m; the maximum grade road is 15 degrees and average grade of not more than 10 degrees; • the road crossfall does not exceed 3 degrees; and • a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided.	
NON-PERIMETER ROADS			
• access roads are designed to allow safe access and egress for firefighting vehicles while residents are evacuating.	Will meet the acceptable solutions.	• minimum 5.5m carriageway width kerb to kerb; • parking is provided outside of the carriageway width; • hydrants are located clear of parking areas; • roads are through roads, and these are linked to the internal road system at an interval of no greater than 500m; • curves of roads have a minimum inner radius of 6m; • the road crossfall does not exceed 3 degrees; and • a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided.	Valley Close complies with the specifications detailed in PBP 2019.
WATER SUPPLIES			
• adequate water supplies is provided for firefighting purposes.	Will meet the acceptable solutions.	• reticulated water is to be provided to the development where available; • a 10,000 litres minimum static water supply for firefighting purposes is provided for each occupied building where no reticulated water is available.	A compliant reticulated water supply is provided.
• water supplies are located at regular intervals; and • the water supply is accessible and reliable for firefighting operations.	Will meet the acceptable solutions.	• fire hydrant, spacing, design and sizing complies with the relevant clauses of Australian Standard AS 2419.1:2005; • hydrants are not located within any road carriageway; and • reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter roads.	A compliant reticulated water supply is provided.
• flows and pressure are appropriate.	Will meet the acceptable solutions.	• fire hydrant flows and pressures comply with the relevant clauses of AS 2419.1:2005.	A compliant reticulated water supply is provided.
• the integrity of the water supply is maintained.	Will meet the acceptable solutions.	• all above-ground water service pipes external to the building are metal, including and up to any taps.	Where provided all above-ground water service pipes will be metal and above-ground water storage tanks shall be of concrete or metal.

Performance Criteria	Method of Compliance	Acceptable Solution	Comments / Details
• water supplies are adequate in areas where reticulated water is not available.		• a connection for firefighting purposes is located within the IPA or non-hazard side and away from the structure; a 65mm Storz outlet with a ball valve is fitted to the outlet; • ball valve and pipes are adequate for water flow and are metal; supply pipes from tank to ball valve have the same bore size to ensure flow volume; • underground tanks have an access hole of 200mm to allow tankers to refill direct from the tank; • a hardened ground surface for truck access is supplied within 4m of the access hole; above-ground tanks are manufactured from concrete or metal; • raised tanks have their stands constructed from non-combustible material or bush fire-resisting timber (see Appendix F AS 3959); • unobstructed access is provided at all times; • tanks on the hazard side of a building are provided with adequate shielding for the protection of firefighters; and • underground tanks are clearly marked, • all exposed water pipes external to the building are metal, including any fittings; • where pumps are provided, they are a minimum 5hp or 3kW petrol or diesel-powered pump, and are shielded against bush fire attack; • Any hose and reel for firefighting connected to the pump shall be 19mm internal diameter; and • fire hose reels are constructed in accordance with AS/NZS 1221:1997 Fire hose reels and installed in accordance with the relevant clauses of AS 2441:2005 Installation of fire hose reels.	A compliant reticulated water supply is provided
ELECTRICITY SERVICES			
• location of electricity services limits the possibility of ignition of surrounding bush land or the fabric of buildings.	Will meet the acceptable solutions.	• where practicable, electrical transmission lines are underground; • where overhead, electrical transmission lines are proposed as follows: o lines are installed with short pole spacing of 30m, unless crossing gullies, gorges or riparian areas; and o no part of a tree is closer to a power line than the distance set out in ISSC3 Guideline for Managing Vegetation Near Power Lines.	Electricity services to be provided in accordance with the specifications provided in Attachment C - Services.
GAS SERVICES			

Performance Criteria	Method of Compliance	Acceptable Solution	Comments / Details
• location and design of gas services will not lead to ignition of surrounding bushland or the fabric of buildings.	Will meet the acceptable solutions.	• reticulated or bottled gas is installed and maintained in accordance with AS/NZS 1596:2014 - The storage and handling of LP Gas, the requirements of relevant authorities, and metal piping is used; • all fixed gas cylinders are kept clear of all flammable materials to a distance of 10m and shielded on the hazard side; • connections to and from gas cylinders are metal; • if gas cylinders need to be kept close to the building, safety valves are directed away from the building and at least 2m away from any combustible material, so they do not act as a catalyst to combustion; • polymer-sheathed flexible gas supply lines are not used; and • above-ground gas service pipes are metal, including and up to any outlets.	Gas services to be provided in accordance with the specifications provided in Attachment C - Services.
EMERGENCY MANAGEMENT PLANNING			
• a Bush Fire Emergency Management and Evacuation Plan is prepared.	Will meet the acceptable solutions.	• Bush Fire Emergency Management and Evacuation Plan is prepared consistent with the: ○ The NSW RFS document: A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan; ○ NSW RFS Schools Program Guide; ○ Australian Standard AS 3745:2010 Planning for emergencies in facilities; and ○ Australian Standard AS 4083:2010 Planning for emergencies – Health care facilities (where applicable). • the Bush Fire Emergency Management and Evacuation Plan should include planning for the early relocation of occupants. Note: A copy of the Bush Fire Emergency Management and Evacuation Plan should be provided to the Local Emergency Management Committee for its information prior to occupation of the development.	A bush fire emergency management and evacuation plan is to be prepared consistent with the NSW RFS document: "*A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan"*, and Australian Standard AS 3745:2010 "*Planning for emergencies in facilities"*. The emergency and evacuation management plan should include a mechanism for the early relocation of the facility users.
• appropriate and adequate management arrangements are established for consultation and implementation of the Bush Fire Emergency Management and Evacuation Plan.	Will meet the acceptable solutions.	• an Emergency Planning Committee is established to consult with residents (and their families in the case of aged care accommodation and schools) and staff in developing and implementing an Emergency Procedures Manual; and • detailed plans of all emergency assembly areas including on-site and off-site arrangements as stated in AS 3745:2010 are clearly displayed, and an annually emergency evacuation is conducted.	An Emergency Planning Committee should be established to consult with Council. Detailed plans of all emergency assembly areas including on-site and off-site arrangements as stated in AS 3745:2010 are clearly displayed, and an annually emergency evacuation is conducted.

ATTACHMENT B – APZS & LANDSCAPING

Inner protection areas (IPAs)

The IPA is the area closest to the asset and creates a fuel-managed area which can minimise the impact of direct flame contact and radiant heat on the development and be a defendable space. Vegetation within the IPA should be kept to a minimum level. Litter fuels within the IPA should be kept below 1cm in height and be discontinuous.

In practical terms the IPA is typically the curtilage around the dwelling, consisting of a mown lawn and well maintained gardens.

When establishing and maintaining an IPA the following requirements apply:

Trees:

- canopy cover should be less than 15% (at maturity)
- trees (at maturity) should not touch or overhang the building
- lower limbs should be removed up to a height of 2m above ground
- canopies should be separated by 2 to 5m
- preference should be given to smooth barked and evergreen trees.

Shrubs:

- create large discontinuities or gaps in the vegetation to slow down or break the progress of fire towards buildings
- shrubs should not be located under trees
- shrubs should not form more than 10% ground cover
- clumps of shrubs should be separated from exposed windows and doors by a distance of at least twice the height of the vegetation.

Grass:

- should be kept mown (as a guide grass should be kept to no more than 100mm in height)
- leaves and vegetation debris should be removed.

Outer protection areas (OPAs)

An OPA is located between the IPA and the unmanaged vegetation. Vegetation within the OPA can be managed to a more moderate level. The reduction of fuel in this area substantially decreases the intensity of an approaching fire and restricts the pathways to crown fuels; reducing the level of direct flame, radiant heat and ember attack on the IPA.

Because of the nature of an OPA, they are only applicable in forest vegetation.

In practical terms the OPA is an area where there is maintenance of the understorey and some separation in the canopy.

When establishing and maintaining an OPA the following requirements apply:

Trees:

- tree canopy cover should be less than 30%
- trees should have canopy separation
- canopies should be separated by 2 to 5m

Shrubs:

- shrubs should not form a continuous canopy
- shrubs should form no more than 20% of ground cover

Grass:

- should be kept mown (as a guide grass should be kept to no more than 100mm in height)
- leaf and other debris should be mown, slashed or mulched.

An APZ should be maintained in perpetuity to ensure ongoing protection from the impact of bush fires. Maintenance of the IPA and OPA to the standards given above should be undertaken on an annual basis, in advance of the fire season, as a minimum.

In Australia, bush fires are a natural and essential aspect of the landscape as many plants and animals have adapted to fire as part of their life cycle. However, development adjacent to bush land areas has increased the risk of fire impacting on people and their assets. The impact on property and life can be reduced with responsible preparation and management of bush fire hazards.

In combination with other BPMs, a bush fire hazard can be reduced by implementing simple steps in reducing vegetation levels. This can be done by designing and managing landscaping to implement an APZ around the property.

This Appendix sets the standards which need to be met within an APZ.

A4.1 Asset protection zones

An APZ is a fuel-reduced area surrounding a built asset or structure.

For a complete guide to APZs and landscaping, download the NSW RFS document *Standards for Asset Protection Zones* at: www.rfs.nsw.gov.au/resources/publications.

An APZ provides:

- a buffer zone between a bush fire hazard and an asset
- an area of reduced bush fire fuel that allows suppression of fire
- an area from which backburning or hazard reduction can be conducted,
- an area which allows emergency services access and provides a relatively safe area for firefighters and home owners to defend their property.

Potential bush fire fuels should be minimised within an APZ. This is so that the vegetation within the planned zone does not provide a path for the transfer of fire to the asset either from the ground level or through the tree canopy.

An APZ, if designed correctly and maintained regularly, will reduce the risk of:

- direct flame contact on the asset
- damage to the built asset from intense radiant heat
- ember attack.

The APZ should be located between an asset and the bush fire hazard.

The methodology for calculating the required APZ distance is contained within Appendix 1. The width of the APZ required will depend upon the development type. APZs for new development are set out within Chapters 5, 6 and 7 of this document.

In forest vegetation, the APZ can be made up of an inner protection area (IPA) and an outer protection area (OPA).

ADDITIONAL CONSTRUCTION REQUIREMENTS (SECTION 7.5 PBP 2019)

To ensure the performance criteria for construction standards given in section 7.4 can be met, PBP adopts additional measures over and above AS 3959 and NASH Standard as follows:

construction measures for ember protection at BAL-12.5 and BAL-19 provided by AS 3959;

construction measures for development in BAL-FZ; and

requirements over and above the performance criteria contained within AS 1530.8.1 and AS 1530.8.2 apply in regard to flaming.

7.5.2 NSW State Variations under G5.2(a) (i) and 3.10.5.0(c)(i) of the NCC

Certain provisions of AS 3959 are varied in NSW based on the findings of the Victorian Bush Fires Royal Commission and bush fire industry research.

The following variations to AS 3959 apply in NSW for the purposes of NSW G5.2(a)(i) of Volume One and NSW 3.10.5.0(c)(i) of Volume Two of the NCC;

clause 3.10 of AS 3959 is deleted and any sarking used for BAL-12.5, BAL-19, BAL-29 or BAL-40 shall:

be non-combustible;

or comply with AS/NZS 4200.1, be installed on the outside of the frame and have a flammability index of not more than 5 as determined by AS 1530.2; and

clause 5.2 and 6.2 of AS 3959 is replaced by clause 7.2 of AS 3959, except that any wall enclosing the subfloor space need only comply with the wall requirements for the respective BAL; and

clause 5.7 and 6.7 of AS 3959 is replaced by clause 7.7 of AS 3959, except that any wall enclosing the subfloor space need only comply with the wall requirements for the respective BAL; and

fascias and bargeboards, in BAL-40, shall comply with:

clause 8.4.1(b) of AS 3959; or

clause 8.6.6 of AS 3959.

FENCES & GATES (SECTION 7.6 PBP 2019)

Fences and gates in bush fire prone areas may play a significant role in the vulnerability of structures during bush fires. In this regard, all fences in bush fire prone areas should be made of either hardwood or non-combustible material.

However, in circumstances where the fence is within 6m of a building or in areas of BAL-29 or greater, they should be made of non-combustible material only.

ATTACHMENT C – NPWS CORRESPONDENCE

Subject: RE: Bushfire Assessment Report - Woodridge
Date: Wednesday, 28 April 2021 at 11:53:42 Australian Eastern Standard Time
From: Marion Battishall
To: Jeff Dau

Hi Jeff,
I have been in consultation with Andrew Harrigan at Thredbo. His advice was that Sub-lessees of Thredbo are not issued an individual APZ Plan (as they are at Perisher) due to the differences in Head lease agreements.

As for Hazardous tree management, If a sub-lessee would like to have a hazardous tree removed, they must first contact Thredbo, whom will then require approval from NPWS .

I would suggest contacting Andrew Harrigan to further discuss the removal of the trees adjacent the lodge. I will support the removal of these trees, as they are growing very close to the lodge, and could be perceived as a fire risk.

Kind Regards,

Marion Battishall
Environmental Liaison Officer
Southern Ranges Branch
NSW National Parks and Wildlife Service

T 02 6451 3719 **M** 0418 689 250
W nationalparks.nsw.gov.au

From: Jeff Dau <jeff@bushfireassessor.com.au>
Sent: Tuesday, 27 April 2021 12:39 PM
To: Marion Battishall <Marion.Battishall@environment.nsw.gov.au>
Subject: Bushfire Assessment Report - Woodridge

Hi Marion,

Thanks for your time the other week. It was nice to meet you in person to discuss bushfire protection of the subject site and I know that Andrew and Ruth found the meeting highly valuable in understanding the issues relating to their development and potential pathways forward.

From this meeting, it is my understanding that there is no opportunity to extended an APZ outside of the proponents boundary (Lot 619 Woodridge Lodge, 9 Valley Close Thredbo) into the subleased land due to the high biodiversity value of the vegetation on this land, including its riparian characteristics. You were however able to provide in-principle support for the further improvement and ongoing maintenance of vegetation with in Lot 619 for the purposes of an APZ for the protection of the existing or a future structure.

If this is correct could you please advise how we can formalise this agreement.

Thanks,

Jeff Dau - Bushfire Planner / Practitioner
EMBER Bushfire Consulting
BAppSc, GradDip Fire Safety Engineering, GradDip Bushfire Protection
FPA Australia – Bushfire Planning and Design (Level 2)

T. 0419826282 E. jeff@bushfireassessor.com.au
W. bushfireassessor.com.au

ATTACHMENT E – EVACUATION ORDER

Public Notice

Department of Planning, Industry and Environment

NSW National Parks and Wildlife Service

NSW GOVERNMENT

2 January 2019 10:00am

Kosciuszko National Park Evacuation Notice

Current situation

- There are large fires to the west and south of Kosciuszko National Park (KNP) that will move in an easterly direction in coming days
- There are multiple other fires within KNP which could expand in coming days. NPWS is continuing to gather intelligence about the location, size and predicted progress of these fires
- Lightning and ember attacks may result in additional fires
- It is unlikely that these fires will be contained in the coming days or weeks
- The current weather forecast indicates that Saturday January 4 will be a bad fire weather day. Fires are likely to spread quickly prior to and during this Saturday
- This is not a fire season that NSW has seen before. It is hotter and drier than we have previously experienced

Evacuations

- An **evacuation order** is applied to all of Kosciuszko National Park and resorts and all other places located within Kosciuszko National Park. All people located in Kosciuszko National Park must exit Kosciuszko National Park boundaries before the deadline of **10:00am eastern daylight savings time Friday January 3, 2020**. This is an essential measure to protect life
- People outside of Kosciuszko National Park need to monitor advice from the NSW RFS and other fire and emergency service agencies to remain informed as to whether other areas outside of Kosciuszko National Park need to evacuate
- Kosciuszko National Park **is closed for entry**. Permanent residents and essential staff may enter but must have evacuated by the deadline of **10:00am Friday January 3, 2020**

Advice

- All property owners, visitors and residents in and outside of Kosciuszko National Park need to act now to protect their assets and ensure their safety in the coming days
- Monitor conditions
- Know what you will do if the fire threatens
- High levels of resources were available around the Snowy Mountains during the large 2003 fires. High levels of resources are not available for these current fires due to demands in other areas around NSW and Australia
- Know where your Neighbourhood Safer Place is and **plan to leave early**

If you are threatened by fire

- Do not be in the path of the fire
- Protect yourself from the heat of the fire. Wear protective clothing and footwear. Cover all exposed skin
- If the fire impacts, seek shelter in a solid structure to protect yourself from the heat of the fire.
- If your life is at risk, call Triple Zero (000)
- If you are in an area that has already been affected by fire, there may be small areas of active fire burning for some time. Be aware of the dangers of trees and branches falling

Other Information

- Stay up to date on bush fires in your area by checking the NSW RFS website https://www.rfs.nsw.gov.au/ listening to your local radio station, or by calling the NSW RFS Bush Fire Information Line on 1800 679 737 some updates may also be provided at https://www.nationalparks.nsw.gov.au/alerts/alerts-list
- Monitor the relevant RFS social media sites
- Know the frequencies of your local radio channels and do not rely on electricity
- People with respiratory conditions who are affected by bush fire smoke should activate their health management plan and seek medical advice if necessary. Take precautions, such as staying indoors and closing windows.
- For information on road closures, check Live Traffic NSW at www.livetraffic.com/
- Roads may be closed without warning.
- Monitor weather conditions and weather warnings at Bureau of Meteorology. http://www.bom.gov.au/

- Evacuation Centre locations:
  - Tumut – Club Tumut Bowling Club
  - Cooma – the showground, Multi-Function Centre

ENDS