

Bushfire Assessment Report

Planning Proposal

At:
**14 Garnet Road,
Kareela NSW**

Reference Number: 200259

Prepared For:
Sylvanvale

21st April 2021



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List of Abbreviations:

APZ	Asset Protection Zone
AS3959	Australian Standard 3959 – 2018 as amended
BAL	Bushfire Attack Level
BPMs	Bushfire Protection Measures
BPLM	Bush Fire Prone Land Map
Council	Sutherland Shire Council
DA	Development Application
EP&A Act	Environmental Planning and Assessment Act - 1979
ESD	Ecologically Sustainable Development
FRNSW	Fire & Rescue NSW
IPA	Inner Protection Area
NCC	National Construction Code
NP	National Park
NSP	Neighbourhood Safer Places
OPA	Outer Protection Area
PBP	Planning for Bush Fire Protection – 2019
ROW	Right of Way
RF Act	Rural Fires Act - 1997
RFS	NSW Rural Fire Service
SBFS	Strategic Bush Fire Study
SEPP	State Environmental Planning Policy
SFPP	Special Fire Protection Purpose
SWS	Static Water Supply

Executive Summary

Building Code and Bushfire Hazard Solution P/L has been commissioned by Sylvanvale to investigate and report the relevant Bushfire Protection Measures (BPMs) applicable to a planning proposal to facilitate a future residential development.

The subject site comprises of two (2) existing allotments (Lot 1142 DP 752064 and Lot 1 DP 225581) with the rezoning application relating to Lot 1142 (147 Garnet Road, Kareela).

Lot 1142 is currently zoned SP2: Infrastructure and is currently being used for educational purposes. The site contains an existing 80 place childcare centre, Sylvanvale Early Learning Service, head office administration building (upper NW portion of the Lot), hydrotherapy pool, classrooms and demountable classrooms (SE portion of the Lot).

The proposed R3: Medium Density Residential zoning will facilitate a future Development Application seeking approval for the construction of forty-three (43) new dwellings and associated infrastructure.

The existing childcare will be retained and continue operations. In this regard a subdivision application will be lodged concurrently with the planning proposal to excise the childcare from the allotment and retain its SP2: Infrastructure zoning. It should be noted that the childcare centre was assessed and approved under Planning for Bush Fire Protection and constructed to Level 1 under Australian Standard 3959 'Construction of buildings in bushfire-prone areas' 1999.

In this instance the subject site is depicted on Sutherland Shire Council's Bushfire Prone Land Map as containing the 30 metre buffer zone from designated Category 2 Vegetation. Subject site is therefore considered 'bushfire prone'.

In relation to this planning proposal Sutherland Shire Council is required to apply section 9.1(2) of the Environmental Planning and Assessment Act 1979. Direction 4.4 Planning for Bushfire Protection identifies matters for consideration for proposals that affect or are in proximity to land mapped as bushfire prone. Under these directions the following objectives apply:

- i. to protect life, property and the environment from bush fire, by discouraging the establishment of incompatible land uses in bush fire prone areas; and*
- ii. to encourage sound management of bush fire prone areas.*

The subject site presents unique characteristics with the mapped bushfire hazard to the north being a form of botanic garden (Joseph Banks Native Plants Reserve), having various themed gardens, a comprehensive network of formed walking paths, picnic tables, BBQ areas and formal sitting areas, amenities building and onsite car parking.

While the mapped hazard is delineated by an existing electrical transmission line easement a conservative assessment has been applied and the entirety of Joseph Banks Native Plants Reserve assessed as a bushfire hazard.

The reserve was noted to have the following attributes influencing bushfire behaviour:

- comprehensive management practices (vegetation management, mulching etc);
- continuous breaks in fuels (as a result of the comprehensive walking path network, electrical transmission lines, rock outcrops and small escarpment);
- elevated sprinklers throughout the reserve; and
- comprehensive vehicle and pedestrian access facilitating early suppression by attending fire services.

In addition to the northern hazard the vegetation associated with Kareela Oval to the south of the subject site has also been assessed as a hazard. This vegetation is not identified as being Category 1 or 2 Vegetation on Council's Bushfire Prone Lands Map, however in consideration of the 'E2: Environmental Conservation' zoning we are of the opinion it is prudent to consider it a bushfire hazard.

The vegetation to the south was found to be heavily weed infested, has a high concentration of coral trees, pittosporums and other known hard to burn species, has a distinct absence of mature canopy trees (visible from aerial imagery), is associated with an existing watercourse and has no direct link to other bushfire hazards in the broader landscape.

A Strategic Bush Fire Study has been undertaken and concluded the proposal is appropriate in the bush hazard context.

In addition to the Strategic Bush Fire Study an assessment of the proposal against Planning for Bush Fire Protection 2019 has concluded the future Development Application has the capacity to satisfy this document.

The proposal has applied the minimum required Asset Protection Zones for residential development from the northern, western and southern boundaries.

A key consideration for planning proposals in bushfire prone areas is limiting or excluding incompatible development commensurate with the level of risk. In this regard the subject site is considered to have a low bushfire risk when considering the characteristics of the vegetation and the fact there have been no recorded wildfires within the immediate area (closest recorded wildfires >2.5km to the southwest).

It is also important to consider the improved outcome as a result of this planning proposal, notably:

- lower vulnerability occupants (Special Fire Protection Purpose occupants being replaced with residential occupants who will be familiar with their surroundings),
- future dwellings which will be built to current standards (AS3959 'Construction of buildings in bushfire-prone areas') will replace existing buildings / demountable classrooms which pre-date any bushfire provisions;
- improved water supply and access arrangements.

The proposal satisfies all relevant specifications and requirements of Planning for Bush Fire Protection 2019 and results in an improved bushfire safety outcome for the site.

1.0 Introduction

The subject site comprises of two (2) existing allotments (Lot 1142 DP 752064 and Lot 1 DP 225581) located within Sutherland Shire Council's local government area.

The rezoning application relates to the northern portion of Lot 1142 (147 Garnet Road, Kareela). The existing childcare will be retained and continue operations and retain the SP2: Infrastructure zoning. In this regard a subdivision application will be lodged concurrently with the planning proposal to excise the childcare from Lot 1142.

Lot 1142 is currently zoned SP2: Infrastructure and is currently being used for educational purposes. The site contains an existing 80 place childcare centre, Sylvanvale Early Learning Service, head office administration building (upper NW portion of the Lot), hydrotherapy pool, classrooms and demountable classrooms (SE portion of the Lot).

The proposed R3: Medium Density Residential zoning will facilitate a future Development Application seeking approval for the construction of forty-three (43) new dwellings and associated infrastructure.

In this instance the subject site is depicted on Sutherland Shire Council's Bushfire Prone Land Map as containing the 30 metre buffer zone from designated Category 2 Vegetation. Subject site is therefore considered 'bushfire prone'.

2.0 Purpose of Report

The purpose of this Bushfire Assessment Report is to provide an independent bushfire assessment together with appropriate recommendations for bushfire mitigation measures considered necessary having regard to development within a designated 'bushfire prone' area.

3.0 Scope of this Report

The scope of this report is limited to providing a bushfire assessment and recommendations for the subject site. Where reference has been made to the surrounding lands, this report does not purport to directly assess those lands; rather it may discuss bushfire impact and/or progression through those lands and possible bushfire impact to the subject site.

4.0 Referenced Documents and Persons

Comments provided are based on the requirements of the NSW Environmental Planning and Assessment Act 1979 (EP&A Act), the Rural Fires Act 1997, the Rural Fires Regulation 2013, the RFS document known as 'Planning for Bush Fire Protection – 2019' for the purposes of bushfire hazard determination and Australian Standard 3959 – 2018 titled 'Construction of buildings in bushfire-prone areas' as amended for building/structural provisions.

Company representatives have undertaken a detailed site inspection of the subject property and surrounding area.

The Site Plan prepared by Couvaras Architects (rev L, dated 9.04.2021) has been relied upon for this assessment.

An aerial photograph of a suburban area with various labels and arrows pointing to specific locations. The labels are in white boxes with black text, and the arrows are orange. The subject site is highlighted with a yellow outline. The surrounding area includes residential streets, a school, a native plants reserve, and sports fields.

Labels and arrows:

- Manooka Place
- Subject site
- Garnet Road
- Mikarie Place
- Joseph Banks Native Plants Reserve
- Bates Drive School
- Bates Drive
- Kareela Oval

A north arrow is located in the bottom right corner, pointing upwards.

Bush Fire Prone Land

- Vegetation Buffer - 100m & 30m; Vegetation Buffer
- Vegetation Category 1
- Vegetation Category 2

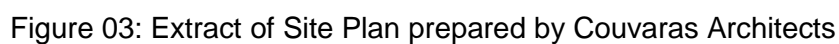
Subject site

Kareela Golf Club

Kareela Oval

North Arrow

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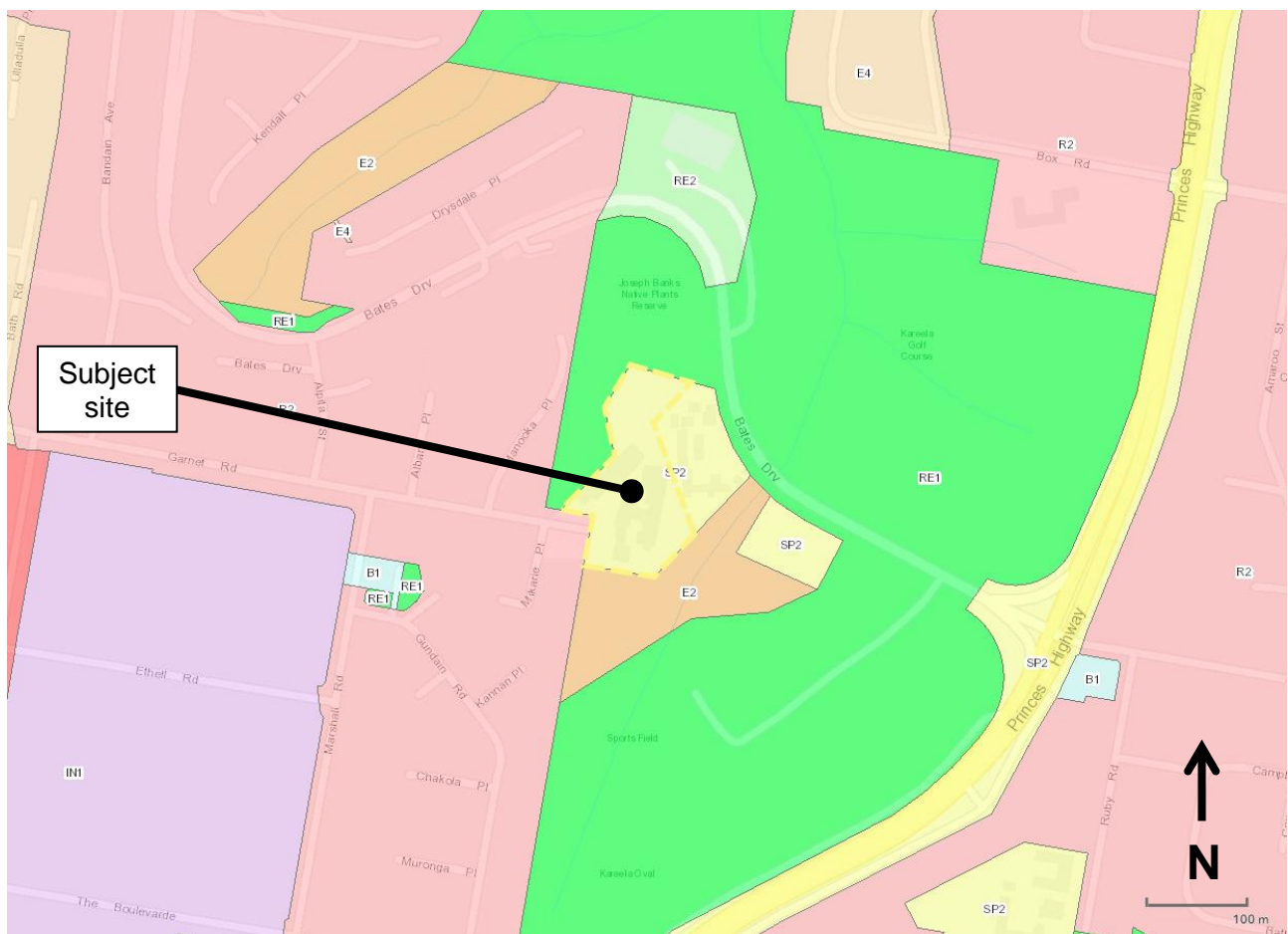


Figure 04: Land zoning of the subject area

Subject site (outlined in yellow) zoned SP2: Infrastructure

6.0 Bushfire Assessment

6.01 Preface

Properties considered to be affected by possible bushfire impact are determined from the local Bushfire Prone Land Map as prepared by Council and/or the Rural Fire Service. All development within affected areas is subject to the application of the relevant specifications and requirements of 'Planning for Bush Fire Protection - 2019' (PBP).

Set back distances for the purpose of creating Asset Protection Zones (APZ's) must be applied and any buildings must then conform to corresponding regulations detailed in Australian Standard 3959 – 2018 'Construction of buildings in bushfire prone areas'.

Planning for Bush Fire Protection – 2019, (PBP) formally adopted on the 1st March 2020 provides for the protection of property and life (including fire-fighters and emergency service personnel) from bushfire impact.

The thrust of the document is to ensure that developers of new properties or sub-divisions include the constraints associated with the construction of buildings in bushfire prone areas within their proposed development sites. PBP is applicable to proposed development on land containing Category 1, 2 or 3 Vegetation and / or their associated buffer zones.

In this instance the subject site is depicted on Sutherland Shire Council's Bushfire Prone Land Map as containing the 30 metre buffer zone from designated Category 2 Vegetation.

When preparing a planning proposal s.9.1(2) of the EP&A Act is required to be applied. Direction 4.4 'Planning for Bushfire Protection' of the s9.1(2) Direction, applies when a Council prepares a draft LEP that affects, or is in proximity to, land mapped as bushfire prone. Under these directions the following objectives apply:

- i. to protect life, property and the environment from bush fire hazards, by discouraging the establishment of incompatible land uses in bush fire prone areas; and
- ii. to encourage sound management of bush fire prone areas.

Under direction 4.4 the Commissioner of the NSW RFS must be consulted and any comments taken into account. As part of the consultation process with the NSW RFS, a bush fire assessment is required to be submitted to demonstrate compliance with the s9.1(2) Directions and PBP.

Consideration must be given to limiting or excluding incompatible development in bushfire affected areas commensurate with the level of risk. A key principle to ensure this is that future development is designed and sited capable of complying with PBP.

The NSW Rural Fire Service also encourages the application of zones that limit or exclude inappropriate development in bushfire prone areas where:

- *the development area is exposed to a high bush fire risk and should be avoided;*
- *the development is likely to be difficult to evacuate during a bush fire due to its siting in the landscape, access limitations, fire history and/or size and scale;*
- *the development will adversely effect other bush fire protection strategies or place existing development at increased risk;*

- *the development is within an area of high bush fire risk where density of existing development may cause evacuation issues for both existing and new occupants; and*
- *the development has environmental constraints to the area which cannot be overcome.*

We provide the following assessment in consideration of the above and Planning for Bush Fire Protection 2019 to highlight the suitability of the site for residential development and the relevant bushfire protection measures.

6.02 Strategic Bush Fire Study

Planning proposals which relate to bushfire prone properties require the preparation of a Strategic Bush Fire Study. The Strategic Bush Fire Study (SBFS) provides opportunity to assess the broader landscape and ultimately assesses whether the new zone and proceeding development is appropriate in the bushfire hazard context.

Once these strategic issues have been addressed in the SBFS, an assessment of whether the proposal can comply with PBP must then be carried out. The assessment against PBP is addressed in section 6.03 of this report.

The following assessment details the components in Table 4.2.1 of PBP which must be addressed in a SBFS.

Bushfire Landscape Assessment

The Bushfire Landscape Assessment component considers the likelihood of a bushfire and its potential severity and intensity and the potential impact on life and property in the context of the broader surrounding landscape.

Location

The subject site comprises of two (2) existing allotments (zoned SP2: Infrastructure and R2: Low Density Residential), being:

Street Address	Lot and DP
147 Garnet Road, Kareela	Lot 1142 DP 752064
2 Mikarie Place, Kirrawee	Lot 1 DP 225581

The subject site is located within Sutherland Shire Council's local government area.

The subject site has street frontage to Mikarie Place to the west and abuts Joseph Banks Native Plants Reserve to the north and west, Bates Drive School to the east and Kareela Oval to the south.

Vegetation

The subject site was predominately found to comprise of hard surface areas with a small pocket of more pronounced vegetation within the north-eastern corner.

As part of this bushfire assessment process consideration has been given to all existing vegetation within neighbouring allotments and any retained or proposed vegetated areas within the subject site. In this regard all grounds within the subject site not built upon will be maintained to the standard of an Asset Protection Zone.

The vegetation identified as posing a bushfire hazard to the subject site is identified on Sutherland Council's Bush Fire Prone Lands Map as being to the north within Joseph Banks Native Plants Reserve. The area north of the existing electricity transmission line easement within Joseph Banks Native Plants Reserve is mapped as Category 2 Vegetation.

Joseph Banks Native Plants Reserve is a form of botanic garden (Joseph Banks Native Plants Reserve), having various themed gardens, a comprehensive network of formed walking paths, picnic tables, BBQ and formal sitting areas, amenities building and other associated features. The reserve also contains onsite car parking and an onsite staff compound.

The overall reserve is 2.2 hectares in size and is bounded by Bates Drive to the north and east, the subject site and Bates Drive School to the south and Manooka Place and existing residential development to the south. The reserve is under the care and control of Sutherland Shire Council.

The vegetation within the reserve has no direct links to larger parcels of vegetation or any other identified bushfire hazards within the broader landscape.

The themed gardens within the reserve include Rainforest, Warm Rainforest, Sun Tolerant Flowering, Acacia, Bush Food, Silver Foliage, Cycad, Shade Tolerant and Lily. These themed gardens are highly modified to achieve the desired theme. Most gardens were extensively mulched and would be considered 'Managed land'.

The reserve also contains remnants of Sydney Sandstone Ridgetop Woodland and Sydney Sandstone Gully Forest which would be more susceptible to the development of fires.

The size of the overall reserve does not achieve the threshold to apply a vegetation downgrade (Remnant hazard) as described in A1.11 of PBP. It is however of our opinion that when considering the attributes of the reserve the Remnant classification is appropriate.

The attributes influencing bushfire behaviour include the comprehensive and inherent management practices associated with the reserve (vegetation management, mulching etc), continuous breaks in fuels (as a result of the comprehensive walking path network, electrical transmission lines, rock outcrops and small escarpment), elevated sprinklers throughout the reserve and comprehensive vehicle and pedestrian access facilitating early suppression. The available fire run toward the subject site from the west also does achieve the threshold for the vegetation downgrade described in A1.11 of PBP.

While we concur with the Category 2 Vegetation classification (which is consistent with a Remnant classification) applied by Council on their BFPM as a conservative measure we have expanded the hazard to capture the entire reserve (i.e. the vegetation south of the electrical easement).

Regardless it should be noted that the proposed setback from the northern boundary exceeds the minimum required Asset Protection Zone for a Forest classification.



Figure 05: Extract of the Joseph Banks Native Plants Reserve site map

While the vegetation associated with Kareela Oval to the south of the subject site is not mapped as Category 1 or 2 Vegetation in consideration of the 'E2: Environmental Conservation' zoning we are of the opinion it is prudent to consider it a bushfire hazard.

The vegetation to the south was found to be heavily weed infested, has a high concentration of coral trees, pittosporums and other known hard to burn species, has a distinct absence of mature canopy trees (visible from aerial imagery), is associated with an existing watercourse and has no direct link to other bushfire hazards in the broader landscape.

In consideration of the absence of mature trees and high concentration of weed varieties and known hard to burn species we have applied the 'Exotic Vegetation' provisions described in A1.9 of PBP and a subsequent classification of Woodland.



Figure 06: Aerial view of the subject area with vegetation assessment
Subject site outlined in red

Slope and Topography

The slope that would most significantly affect bushfire behaviour must be assessed for at least 100 metres from within the bushfire hazards.

The most significant bushfire impact from the north would be a bushfire burning up slope toward the subject site.

The most significant bushfire impact from the south and west would be a bushfire burning down slope toward the subject site.

There is a 2-6m high escarpment within Joseph Banks Native Plants Reserve to the west adjacent the subject property. This escarpment is expected to reduce the effects of a bushfire impacting from this aspect.

The slope that would **most significantly** influence bushfire impact was determined onsite using an inclinometer and verified using 1 metre LiDar contour mapping of the subject area to be:

- 0 – 5 degrees down slope within the hazard to the north
- 0 degrees and up slope within the hazard to the south and west

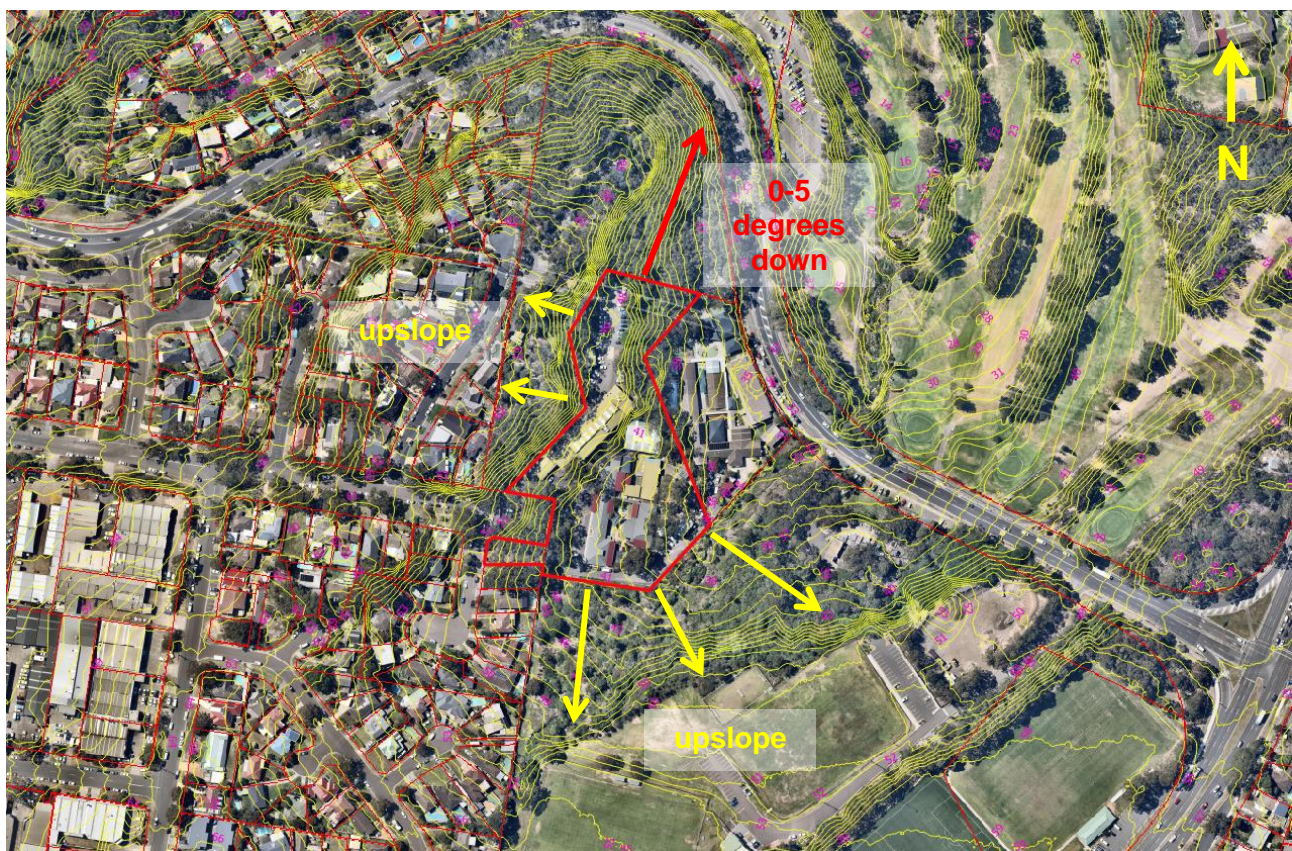


Figure 07: LiDar contour mapping of subject area (1m contours)

Fire Weather

The subject site is located within the Greater Sydney Region Fire Area which attracts a Fire Danger Index (FDI) of 100 for bushfire planning purposes.

Previous Bushfire History

There are areas within NSW that have significant fire history and are recognised as known fire paths. In a planning context it is important to identify these locations and ensure incompatible development is not proposed.

In this instance there have been no recorded wildfires or hazard reductions within Joseph Banks Native Plants Reserve or the vegetation to the south associated with Kareela Oval (source NPWS Fire History dataset).

There were also no visual indicators of previous bushfires at the time of our inspection.

The closest recorded wildfires were found to be located >2.5 kilometres to the southwest of the subject site with that area having a fairly high frequency (1971-72, 1977-78, 1982-83, 1991-92 and 1993-94).

The subject site is therefore not considered to be within a known fire path. Furthermore in consideration of the previous bushfire history the likelihood of a bushfire occurring within the immediate area is considered unlikely.

It is noted that our 'unlikely' assessment of the likelihood of a bushfire event for the subject area is consistent with the assessment detailed within Sutherland Shire Bush Fire Management Committee – Bush Fire Risk Management Plan 2016 which also nominates an 'unlikely' likelihood.

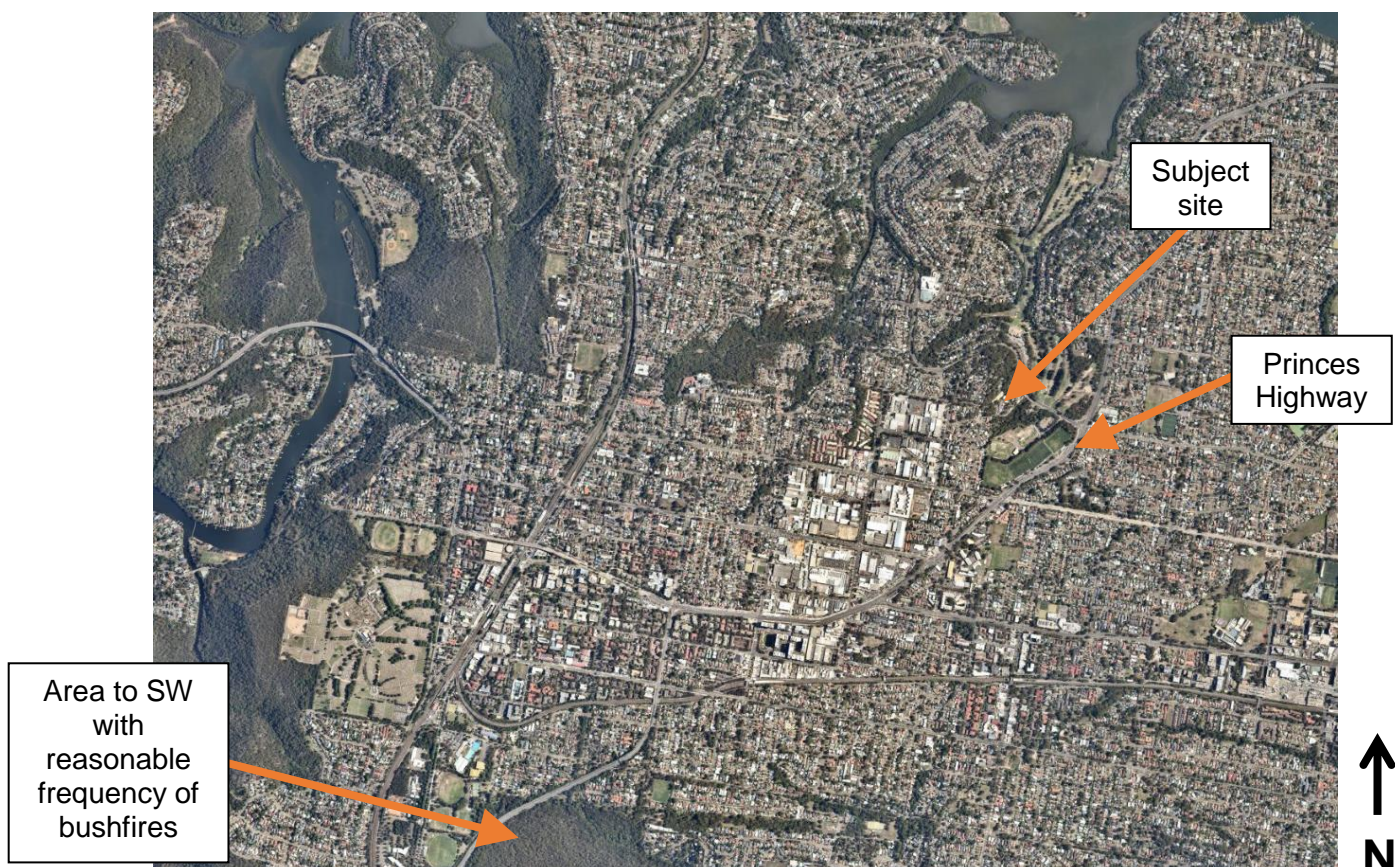


Figure 08: Aerial view of the subject area

Potential Fire Behaviour

The most significant bushfire threat to the subject site is considered to be from the north within Joseph Banks Native Plants Reserve from the area mapped as being Category 2 Vegetation on Council's Bush Fire Prone Lands Map.

This aspect has the largest area of remnant Sydney Sandstone Gully Forest and Sydney Sandstone Ridgetop Woodland within the reserve, provides a potential upslope run toward the site and is an aspect more attributed to severe fire activity.

When considering the potential bushfire impact to this aspect the comprehensive network of walking trails, formal sitting areas, presence of the 'Rainforest Garden' adjacent the subject site, presence of elevated water sprayers throughout the reserve and comprehensive access available via the adjacent public roads and internal trail network must also be considered.

While this vegetation can support the growth of fire when considering the limited fire development period (<150m toward the site) and aforementioned considerations it is of our opinion that the area has little opportunity to support a fully developed bushfire. Under the right circumstances localised flaring could be expected.

In applying the parameters described in this section and accepted assessment methodology described in PBP bushfire design modelling indicates the vegetation posing a hazard to the north has the following potential outputs:

Bushfire Behaviour	Output
Flame Length	12.54 metres
Rate of Spread	1.69 km/h
Fire Intensity	11,381 kW/m

The vegetation posing a hazard to the south and west was determined to have the following potential outputs:

South:

Bushfire Behaviour	Output
Flame Length	7.92 metres
Rate of Spread	0.85 km/h
Fire Intensity	8,782 kW/m

West:

Bushfire Behaviour	Output
Flame Length	7.08 metres
Rate of Spread	0.85 km/h
Fire Intensity	5,708 kW/m

It must be noted that the above modelling does not factor in the site specific considerations described herein which are expected to reduce the severity of the bushfire behaviour and subsequent impact to the site.

Access & Suppression

Access for attending fire services to undertake early suppression is a key factor in whether a fire has the opportunity to develop into a quasi-steady state at which point the opportunity to control / extinguish the fire becomes far more challenging.

Where good access is available it provides opportunity to control / extinguish a fire in its growth phase before developing further and consequently becoming more difficult to conduct direct attacks.

In this particular instance Joseph Banks Native Plants Reserve has street frontage to Bates Drive to the north and east, Garnet Road to the south and Manooka Place to the west. The reserve has a comprehensive network of formed walking paths, elevated water sprayer system and taps with hoses throughout.

In consideration of the comprehensive access available to and through the reserve and its exposure to the public the identification and subsequent early extinguishment of a bushfire in the reserve is considered probable.

In relation to the southern hazard, attending fire services will have direct access via the internal road within the subject site, Bates Drive and the existing works depot or the existing internal road and carpark within Kareela Oval. Hydrants are also available along Bates Drive, the internal road within Kareela Oval and throughout the subject site for the replenishment of attending fire services.

In consideration of the comprehensive access available to Kareela Oval and its exposure to the public the identification and subsequent early extinguishment of a bushfire within Kareela Oval is also considered probable.

Land Use Assessment

The Land Use Assessment identifies the most appropriate locations in the Masterplan area for the proposed land uses.

In this instance the proposal does not include a broad masterplan but rather a specific 'spot' rezoning to facilitate a future residential development.

The subject site is currently being used for educational purposes, a listed Special Fire Protection Purpose (SFPP) under section 100B of the Rural Fires Act 1997. SFPP development is one which is occupied by people who are considered to be at-risk members of the community.

The proposal will remove the SFPP use from the northern portion of the property which is the highest risk portion of the property. The proposed residential use is considered lower risk than SFPP as residents do not require as much assistance from emergency service in the event of a bushfire emergency and where appropriate can undertake property protection activities.

While the childcare centre will be retained it is located in the southern portion of the site, was assessed and approved under Planning for Bush Fire Protection and constructed to Level 1 under Australian Standard 3959 'Construction of buildings in bushfire-prone areas' 1999.

It is also important to consider the improved outcome as a result of this planning proposal, notably:

- lower vulnerability occupants (Special Fire Protection Purpose occupants being replaced with residential occupants who will be familiar with their surroundings),
- future dwellings which will be built to current standards (AS3959 'Construction of buildings in bushfire-prone areas') will replace existing buildings / demountable classrooms which pre-date any bushfire provisions;
- improved water supply and access arrangements.

It is noted that the subject site is currently identified as having a 'High' risk rating in Sutherland Shire Bush Fire Management Committee – Bush Fire Risk Management Plan 2016. This 'high' rating is a product of the likelihood (unlikely) and consequence (Catastrophic) with the former being determined based on the current use of the site.

In applying the proposed land use and bushfire protection measures described herein we are of the opinion that the consequence rating would reduce and with it the overall risk rating.

We are therefore of the opinion the proposed land uses are appropriate.

Access and Egress

It is important to assess the capacity of both the existing and proposed road networks both within and external to the masterplan area.

The existing educational facility is accessed via Mikarie Place to the west.

The Traffic and Parking Impact Assessment for the proposal prepared by McLaren Traffic Engineering (ref 190560.01FA, dated 28th May 2020) estimate that the existing educational facility generates 232 AM and 224 PM vehicle trips per day. Conversely following the execution of the proposed residential development the estimated generated vehicle trips reduce to 126 AM and 108 PM, a reduction of 106 trips. The Traffic and Parking Impact Assessment concludes:

'As shown, post-development it has been estimated that there will be net reduction of 106 trips in both the AM and PM peak hours when compared to the existing traffic generation of the site, noting that both the existing incoming and outgoing trips are reduced. This net reduction in traffic generation will result in a net improvement in the performance of the road network in the surrounds of the site and no further analysis is necessary.'

The key evacuation route from the subject site is to the west via Mikarie Place and Garnet Road. From Garnet Road residents / occupants can travel south toward Kareela Oval, being the local Neighbourhood Safer Place.

Mikarie Place and Garnet Road were found to exceed the minimum carriageway requirements for non-perimeter roads as described in section 5.3.2 of PBP.

In consideration of the surrounding road network and proposed use the access and egress routes are considered acceptable. Furthermore it has been concluded that as a result of the proposal the performance of the road network in the surrounds of the site will be improved.

Emergency Services

In some circumstances the scale of a planning proposal warrants a need to include provisions for a new fire station.

The subject site is located within the NSW Fire and Rescue area and has six (6) fire stations (NSW Rural Fire Service and NSW Fire & Rescue) located within 5 kilometres (measure in line of sight) (source street-directory.com.au).

In consideration of the relatively modest size of the future residential development the existing fire service coverage is considered acceptable.

Infrastructure

An assessment of the issues associated with infrastructure and utilities must be undertaken. This assessment is to include the ability of the reticulated water system to deal with a major bushfire event in terms of pressures, flows and spacing of hydrants.

The subject site is connected to reticulated towns water which in this locality is serviced by Sydney Water. The capabilities of the broader hydrant network is the responsibility of Sydney Water. The modest size of the future residential development is unlikely to have a significant adverse impact on this system.

The site contains an existing boosted internal hydrant system which will be upgraded / modified to service the future dwellings. The sizing, spacing and pressures of the internal hydrant system must comply with AS2419.1-2005.

The subject site includes an electrical transmission line easement within its northern portion. The proposal has excluded any development within this easement. In consideration of the potential bushfire behaviour detailed in section 6.02 of this report the electrical transmission lines are not considered to pose an unacceptable risk to the proposal.

6.03 Planning for Bush Fire Protection

As the strategic issues have been satisfactorily addressed in the SBFS, an assessment of whether the proposal can comply with PBP is required. This section addresses the future residential developments capacity to comply with the relevant specifications and requirements of PBP.

Asset Protection Zones

Asset Protection Zones (APZs) for residential subdivision are determined from Table A1.12.2 of Planning for Bush Fire Protection 2019 (PBP) or bushfire design modelling achieving a radiant heat impact of no more than 29 kW/m² at a building footprint.

The minimum required Asset Protection Zones for the future residential development were determined from Table A1.12.2 of PBP to be 14 metres to the north, 12 metres to the south and 11 metres to the west. These minimum required APZs are depicted on Attachment 01.

Due to the presence of the electrical transmission line easement a 30 metre setback will be provided from the northern boundary, increasing the minimum required APZ by over twofold.

The available APZs consist of the land entirely within the subject site (including roads).

The subject site has the capacity to comply with the minimum required Asset Protection Zones as detailed in PBP 2019.

Fire Fighting Water Supply

The site contains an existing boosted internal hydrant system which will be upgraded / modified to service the future dwellings. The sizing, spacing and pressures of the internal hydrant system must comply with AS2419.1-2005.

Hydrants are also available along Mikarie Place, Garnet Road, Bates Drive and surrounding public roads for the replenishment of attending fire services.

The subject site has the capacity to comply with the Water Supply requirements as detailed in section 5.3.3 of PBP.

Property Access – Fire Services & Evacuation

The subject site has street frontage to Mikarie Place to the west.

Planning for Bush Fire Protection addresses design considerations for internal roads (public roads) for properties determined to be bushfire prone.

The proposed Site Plan prepared by Couvaras Architects maintains the vehicle access from Mikarie Place to the existing childcare centre and right of way along the southern boundary to Bates Drive School.

The proposal includes a one-way loop from the internal road around the retained childcare centre back onto the two-way right of way. Access will be available from the one-way loop to the proposed basement car parks. The proposed internal roads have the capacity to comply with the access requirements from non-perimeter roads detailed in PBP.

Pedestrian access will be provided to the northern portion of the subject site.

While it is acknowledged perimeter roads are the preferred design option of the NSW Rural Fire Service the site characteristics and other competing constraints in this instance are not conducive to a through perimeter road being incorporated along the western and northern boundary. Furthermore the application of the preferred design options must be considered in context of the site and intent of that measure.

Perimeter roads are typically provided to separate bushland from urban areas, allowing more efficient use of firefighting resources. Perimeter roads also provide space to conduct firefighting operations and hazard reduction activities.

In this instance Joseph Banks Native Plants Reserve has street frontage to existing public roads on four sides, being Bates Drive to the north and east, Garnet Road to the south and Manooka Place to the west, with these roads having hydrants located throughout. Vehicle access into the reserve is available from Bates Drive to the staff compound and from Manooka Place to the onsite parking area.

Due to the modest size of the reserve attending fire services located on the public road system will be within two (2) hose lengths of other units positioned on the opposite side of the reserve, while having direct access to town's water.

These roads are considered to be the logical fire fighting platform in the event of a bushfire within the reserve, particularly when considering the preference of fire services to remain on the public road system.

In addition to the vehicle access available to Joseph Banks Native Plants Reserve there is a comprehensive network of formed walking paths, elevated water sprayer system and taps with hoses throughout the reserve.

In consideration of the comprehensive access available to and through the reserve, previous bushfire history and other characteristics it is of our opinion the existing public road system provides for an efficient use of firefighting resources and a space to conduct effective firefighting operations.

We are satisfied that the proposed internal road system has the capacity to comply with the requirements for Access under section 5.3.2 of PBP 2019.

7.0 Site & Bushfire Hazard Determination

7.01 Planning for Bush Fire Protection - 2019

Planning for Bush Fire Protection – 2019 (PBP) is applicable to those lands determined as being within a 'bushfire prone area' in accordance with a local Bushfire Prone Land Map as provided by the Rural Fire Service and Councils.

The most appropriate method of determining site bushfire hazard under the terms of PBP is to consider the site in a singular form.

Bushfire prone areas are defined as those areas;

- *containing or within 100m of Category 1 Vegetation; or*
- *containing or within 30m of Category 2 or 3 Vegetation.*

7.02 Australian Standard AS 3959 – 2018 'Construction of buildings in bushfire –prone areas'

Australian Standard 3959 – 2018 'Construction of buildings in bushfire-prone areas' provides for six (6) levels of building construction these being BAL - Low, BAL - 12.5, BAL - 19, BAL - 29, BAL - 40 and BAL - FZ. The Australian Standard 3959 specifies construction standards for buildings within various Bushfire Attack Levels as determined by the Planning for Bush Fire Protection – 2019 document. The NSW Rural Fire Service will not accept deemed to satisfy provisions for BAL Flame Zone and therefore have a NSW variation to the listed standard provisions of BAL FZ under AS3959 - 2018.

7.03 Correlation between bushfire impact and AS3959

Bushfire Attack Level	Maximum radiant heat impact (kW/m ²)	Level of construction under AS3959-2018
Low		No special construction requirements
12.5	≤12.5	BAL - 12.5
19	12.6 to 19.0	BAL - 19
29	19.1 to 29.0	BAL - 29
40	29.1 to 40.0	BAL - 40
Flame Zone	>40.0	BAL FZ No deemed to satisfy provisions

7.04 Viable Construction Method

The objectives of Planning for Bush Fire Protection – 2019 are for the protection of life including fire fighters. Provided these objectives can be met the construction of buildings is feasible and both the Rural Fire Service and Council should be in a position to consider such applications.

No new dwellings are proposed as part of this application. Future residential development will require further assessment under s4.14 of the *Environmental Planning and Assessment Act 1997* or *State Environmental Planning Policy (Exempt and Complying Development)* 2008 at the time of any application for the construction of any new dwelling.

8.0 Conclusion

The subject site comprises of two (2) existing allotments (Lot 1142 DP 752064 and Lot 1 DP 225581) with the rezoning application relating to Lot 1142 (147 Garnet Road, Kareela).

Lot 1142 is currently zoned SP2: Infrastructure and is currently being used for educational purposes. The site contains an existing 80 place childcare centre, Sylvanvale Early Learning Service, head office administration building (upper NW portion of the Lot), hydrotherapy pool, classrooms and demountable classrooms (SE portion of the Lot).

The proposed R3: Medium Density Residential zoning will facilitate a future Development Application seeking approval for the construction of forty-three (43) new dwellings and associated infrastructure.

The existing childcare will be retained and continue operations. In this regard a subdivision application will be lodged concurrently with the planning proposal to excise the childcare from the allotment and retain its SP2: Infrastructure zoning. It should be noted that the childcare centre was assessed and approved under Planning for Bush Fire Protection and constructed to Level 1 under Australian Standard 3959 'Construction of buildings in bushfire-prone areas' 1999.

In this instance the subject site is depicted on Sutherland Shire Council's Bushfire Prone Land Map as containing the 30 metre buffer zone from designated Category 2 Vegetation and therefore the subject site is considered 'bushfire prone'.

We are satisfied that the subject site and proposed Concept Layout Plan has the capacity to comply with the relevant specifications and requirements of Planning for Bush Fire Protection 2019.

Furthermore we are satisfied that the proposed Concept Layout Plan, in combination with the bushfire protection measures discussed herein will not result in areas that are difficult to evacuate, create control difficulties during a bushfire or adversely affect other bush fire protection strategies or place existing development at increased risk.

We are therefore in support of the rezoning application.

Should you have any enquiries regarding this project please contact me at our office.

Prepared by
Building Code & Bushfire Hazard Solutions P/L



Stuart McMonnies

Manager Bushfire Section
G. D. Design in Bushfire Prone Areas.
Certificate IV Fire Technology
Fire Protection Association of Australia BPAD – L3 Accredited Practitioner
Certification number – BPAD9400



9.0 Annexure 01

List of Referenced Documents

- a) Environmental Planning and Assessment Act - 1979
- b) Rural Fires Act 1997 as amended
- c) "Planning for Bush Fire Protection" - NSW Rural Fire Services 2019
- d) 'Construction of buildings in bushfire prone areas' - AS 3959 – 2018 (as - amended) – Standards Australia
- e) 'Sutherland Shire Council's Bushfire Prone Land Map
- f) Acknowledgements to:
 - NSW Department of Lands – SixMaps
 - Nearmap.com
 - Geoscience Australia (ELVIS)
 - QGIS
 - Street-directory.com.au
- g) Site Plan prepared by Couvaras Architects (rev L, dated 9.04.2021)
- h) Sutherland Shire Bush Fire Management Committee – Bush Fire Risk Management Plan 2016
- i) NPWS Fire History – Wildfires and Prescribed Burns Fire History dataset, NSW Department of Planning, Industry and Environment (2018)

Attachments

- Attachment 01: Asset Protection Zone Overlay
- Attachment 02: Bushfire Attack Assessment Report

COMMENT TEXT



**Building Code &
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LEGEND

 **APZ MINIMUM SETBACK (IPA)
PBP -2019**

**BUSHFIRE
CONSTRAINTS
OVERLAY**

REFERENCE NO.	200259	LOT 1142 DP 752064			
ADDRESS	147 GARNET ROAD, KAREELA NSW				
DATE.	01/10/2019	DRAWN BY	IT	SCALE: NTS	
REVISION	B	REVISION DATE	05/05/2020		
CLIENT	SYLVANVALE FOUNDATION LTD				



NBC Bushfire Attack Assessment Report V4.0

AS3959 (2018) Appendix B - Detailed Method 2

Print Date: 4/05/2020

Assessment Date: 4/05/2020

Site Street Address: 147 Garnet Road, Kareela

Assessor: Stuart McMonnies; Bushfire Hazard Solutions

Local Government Area: Sutherland Shire

Alpine Area: No

Equations Used

Transmissivity: Fuss and Hammins, 2002

Flame Length: RFS PBP, 2001/Vesta/Catchpole

Rate of Fire Spread: Noble et al., 1980

Radiant Heat: Drysdale, 1985; Sullivan et al., 2003; Tan et al., 2005

Peak Elevation of Receiver: Tan et al., 2005

Peak Flame Angle: Tan et al., 2005

Run Description: North

Vegetation Information

Vegetation Type: Rainforest

Vegetation Group: Forest and Woodland

Vegetation Slope: 5 Degrees

Vegetation Slope Type: Downslope

Surface Fuel Load(t/ha): 10

Overall Fuel Load(t/ha): 13.2

Vegetation Height(m): 2

Only Applicable to Shrub/Scrub and Vesta

Site Information

Site Slope: 3 Degrees

Site Slope Type: Downslope

Elevation of Receiver(m) Default

APZ/Separation(m): 14

Fire Inputs

Veg./Flame Width(m): 100

Flame Temp(K): 1090

Calculation Parameters

Flame Emissivity: 95

Relative Humidity(%): 25

Heat of Combustion(kJ/kg) 18600

Ambient Temp(K): 308

Moisture Factor: 5

FDI: 100

Program Outputs

Level of Construction: BAL 29

Peak Elevation of Receiver(m): 5.01

Radiant Heat(kW/m2): 29

Flame Angle (degrees): 66

Flame Length(m): 12.54

Maximum View Factor: 0.444

Rate Of Spread (km/h): 1.69

Inner Protection Area(m): 14

Transmissivity: 0.86

Outer Protection Area(m): 0

Fire Intensity(kW/m): 11381

Run Description:	South		
<u>Vegetation Information</u>			
Vegetation Type:	Grassy and Semi-Arid Woodland (including Mallee)		
Vegetation Group:	Forest and Woodland		
Vegetation Slope:	5 Degrees	Vegetation Slope Type:	Upslope
Surface Fuel Load(t/ha):	10.5	Overall Fuel Load(t/ha):	20.2
Vegetation Height(m):	2	Only Applicable to Shrub/Scrub and Vesta	
<u>Site Information</u>			
Site Slope	0 Degrees	Site Slope Type:	Downslope
Elevation of Receiver(m)	Default	APZ/Separation(m):	9
<u>Fire Inputs</u>			
Veg./Flame Width(m):	100	Flame Temp(K):	1090
<u>Calculation Parameters</u>			
Flame Emissivity:	95	Relative Humidity(%):	25
Heat of Combustion(kJ/kg	18600	Ambient Temp(K):	308
Moisture Factor:	5	FDI:	100
<u>Program Outputs</u>			
Level of Construction:	BAL 29	Peak Elevation of Receiver(m):	3.56
Radiant Heat(kW/m2):	29	Flame Angle (degrees):	64
Flame Length(m):	7.92	Maximum View Factor:	0.436
Rate Of Spread (km/h):	0.85	Inner Protection Area(m):	9
Transmissivity:	0.874	Outer Protection Area(m):	0
Fire Intensity(kW/m):	8782		

Run Description:	West		
<u>Vegetation Information</u>			
Vegetation Type:	Rainforest		
Vegetation Group:	Forest and Woodland		
Vegetation Slope:	5 Degrees	Vegetation Slope Type:	Upslope
Surface Fuel Load(t/ha):	10	Overall Fuel Load(t/ha):	13.2
Vegetation Height(m):	2	Only Applicable to Shrub/Scrub and Vesta	
<u>Site Information</u>			
Site Slope	0 Degrees	Site Slope Type:	Upslope
Elevation of Receiver(m)	Default	APZ/Separation(m):	8
<u>Fire Inputs</u>			
Veg./Flame Width(m):	100	Flame Temp(K):	1090
<u>Calculation Parameters</u>			
Flame Emissivity:	95	Relative Humidity(%):	25
Heat of Combustion(kJ/kg	18600	Ambient Temp(K):	308
Moisture Factor:	5	FDI:	100
<u>Program Outputs</u>			
Level of Construction:	BAL 29	Peak Elevation of Receiver(m):	3.18
Radiant Heat(kW/m2):	29	Flame Angle (degrees):	64
Flame Length(m):	7.08	Maximum View Factor:	0.435
Rate Of Spread (km/h):	0.85	Inner Protection Area(m):	8
Transmissivity:	0.877	Outer Protection Area(m):	0
Fire Intensity(kW/m):	5708		