PLANNING PROPOSAL ASSOCIATED WITH BOUNDARY ADJUSTMENT AND FUTURE DWELLING ENTITLEMENT

LOT 11 DP1226788 & LOT 841 DP1253894

OLD SOUTH ROAD

MITTAGONG. NSW. 257575

BUSH FIRE HAZARD ASSESSMENT

Prepared by SOWDES
22 July 2022

A: PO Box 619, Goulburn. NSW. 2580 | M: 0428 863 401 | E: sowdes@sowdes.com

BUSH FIRE HAZARD RISK ASSESSMENT CERTIFICATION STATEMENT

Property Details	Lot 11 DP1226788 & Lot 841 DP1253894 Old South Road, Mittagong. NSW. 2575
Description of the Development	Boundary adjustment
Relevant Chapter/s from Planning for Bush Fire Protection (2019) that apply to the development	Chapter 5
Is referral to the NSW Rural Fire Service required as a subdivision development, as a type of 'Special Fire Protection Purpose' (SFPP), or does the proposal rely on the submission of a 'performance solution' based approach or the submission of a Bush Fire Design Brief (BFDB)	Yes Planning Proposal - Amendment to LEP
Has a pre-DA lodgement meeting with the RFS been held in relation to this development	No
Highest BAL rating for the development	BAL-29
Bush Fire Hazard Assessment Reference #	0050322
Plan Reference #	0050322-04A
Bush Fire Hazard Assessment Report Date	22 July 2022
Accredited Scheme / Accreditation #	FPA Australia (*FPAA*) Bush Fire Planning & Design - Level 3 - BPAD27823

I; Paul Johnson of SOWDES hereby certify that:
a). I have carried out a bush fire risk assessment on the above-mentioned proposal and property. A detailed Bush Fire Assessment Report is attached which includes the submission requirements set out in *Appendix 2* of *Planning for Bush Fire Protection (2019)* together with recommendations as to how the relevant specifications and requirements are to be achieved.
b). That I am a person recognised by the *NSW Rural Fire Service* as a qualified consultant in bush fire risk assessment; and
c). That subject to the recommendations contained in the attached Bush Fire Risk Assessment Report the proposed development conforms to the relevant specifications and requirements.

I am aware that the Bushfire Assessment Report, prepared for the above-mentioned site is to be submitted in support of a development application for this site and will be relied upon by Wingecarribee Shire Council as the basis for ensuring that the bushfire risk management aspects of the proposed development have been addressed in accordance with *Planning for Bushfire Protection 2019*.

22 July 2022

BPAD Bushfire Planning & Design Accredited Practitioner Level 3

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List of Abbreviations that may be used throughout this report

APZ	Asset Protection Zone
AS 3959	AS3959 - 2018 Construction of Buildings in Bush Fire Prone Area
BAL	Bush Fire Attack Level
BCA	Building Code of Australia
BFSA	Bush Fire Safety Authority
BPMs	Bush Fire Protection Measures
CC	Construction Certificate
DA	Development Application
DCP	Development Control Plan
EP&A ACT	Environmental Planning & Assessment Act (1979)
FDI	Fire Danger Index
IPA	Inner Protection Area
LEP	Local Environmental Plan
OPA	Outer Protection Area
PBP	Planning for Bush Fire Protection (2019)
RF Act	NSW Rural Fires Act (1997)
RF Reg	NSW Rural Fires Regulation (2008)
RFS	NSW Rural Fire Service
RHF	Radiant Heat Flux
ROS	Rate of Spread
SEPP	State Environmental Planning Policy
SFPP	Special Fire Protection Purpose

It is acknowledged that certain parts of this report contain images and directly quoted information from a range of sources including but not limited to; Planning for Bush Fire Protection (2019), Planning for Bush Fire Protection (2006), AS3959 (2018) Construction of Buildings in Bushfire Prone Areas, and a range of other NSW Rural Fire Service resources and publications.

Executive Summary.

This *Bush Fire Hazard Assessment* has been prepared in support of a Planning Proposal submission to the Wingecarribee Shire Council which is seeking an amendment to the relevant provisions within the Wingecarribee Local Environmental Plan (2010) regarding a proposed boundary adjustment and the retention of residential building entitlements on a portion of land that will be less than the minimum Lot size for building entitlements within the land zoning. The parcels of land associated with the development proposal are identified as Lot 11 DP1226788 and Lot 841 DP1253894 located at Old South Road, Mittagong comprising 41.70 hectares of 'C3 - Environmental Management' zoned lands which form the operational site for the Mittagong Airfield. The relevant provisions within the Wingecarribee Local Environmental Plan (2010) that the Planning Proposal is seeking an amendment are contained within 'Part 4 – Principal Development Standards' – subsection '*4.2A - Erection of dwelling houses and dual occupancies on land in certain rural and environment protection zones'*.

The proposed development contains portions of land that are designated as bush fire prone and therefore this Bush Fire Hazard Assessment has been undertaken in accordance with the criteria of both the Wingecarribee Shire Council and the New South Wales Rural Fire Service's (NSW RFS) 'Submission Information' requirements for a proposed subdivision of land within a bush fire prone mapped area.

This report provides an independent assessment of the proposed development with regard to protection of life and property, the general construction standards within bush fire prone areas and follows the relevant guidelines and information requirements of the NSW RFS's publication "Planning for Bush Fire Protection" (2019) (PBP), Clause 44 of the Rural Fires Regulation (2008) (RF Reg), Section 4.46 of the Environmental Planning and Assessment Act (1979) (EP&A Act), Section 100B of the Rural Fires Act (1997) (RF Act), and 'AS 3959-2018 Construction of Buildings in Bush Fire Prone Areas'.

The subject site is located approximately 2 kilometres due east of the residential precincts within the township of Mittagong and is formally accessed from the southern aspect of the Old South Road traffic corridor. The property is an irregular shaped parcel of land with the northern facing boundary following the alignment of Old South Road and the western facing boundary being bordered by the Diamond Fields Road traffic corridor from where there is a second but rarely used gated entrance to the site.

The two parcels of land that make up the holding are themselves irregularly shaped with Lot 11 DP1226788 which comprises 37.28 hectares formed over two portions of 35.99 and 1.277 hectares that are separated by a 10.06 metre wide unformed road reserve, and Lot 841 DP1253894 comprising the residual area of 4.434 hectares in a somewhat 'L' shape forming what is effectively the eastern half of the sealed runway at the airfield.

The proposed boundary adjustment will seek to redistribute the boundaries such that the airfield operations will be contained within a single portion of land that comprises 31.06 hectares (proposed Lot 843) and the residual portion which is seeking to retain the building entitlement already associated with the site is to comprise 10.64 hectares in the southwest quarter of the holding (proposed Lot 844).

A portion of forested land within the southern half of the site (that also continues into the adjoining land to the south – Lot 12 DP1226788) is burdened by a registered Positive Covenant (DP1226788) in favour of Water NSW that prohibits the clearing or harvesting of native vegetation without the written approval from the agency. It is noted that the covenant does permit the clearing of native vegetation within the delineated area to the extent necessary for the purposes of an asset protection zone for bush fire protection around a future dwelling subject to formal development approval and with the written consent of the agency. This clause within the Positive Covenant has been used to identify a potential dwelling envelope within the proposed Lot 844 which will have the smallest impact on existing native vegetation, and where the requirements to establish an asset protection zone for bush fire protection purposes can also be used for the onsite disposal of secondary treated effluent.

The development property is not serviced by a Council maintained reticulated water supply and therefore any future residential dwelling development within the proposed Lot 844 will be required to provide a static water supply in accordance with Table 5.3d of Planning for Bush Fire Protection (2019). Lot 844 will be larger than 1 hectare in area and therefore in accordance with Table 5.3d of Planning for Bush Fire Protection (2019) will be required to provide a minimum static water supply of 20,000 litres in a non-combustible storage tank.

Within this bush fire hazard assessment a 'potential building envelope' having a nominal area of 600m² has been identified within the proposed Lot 844 which is based on a combination of considerations including (but not limited to) the requirements of PBP and particularly addressing matters such as asset protection, vegetation, topography, proximity to mapped bush fire prone land, access and egress, and general bush fire protection measures.

The following key summaries apply to the development and are detailed in the following pages:

- The proposed boundary adjustment will seek to retain an existing building entitlement that is associated with the site and have it tied to the proposed Lot 844 that will comprise approximately 10.64 hectares in the southwestern portion of the site
- A 'potential development envelope' has been identified within the proposed Lot 844 that will not expose the building, occupants or emergency services personnel to radiant heat levels exceeding 29kW/m².
- The 'potential development envelope' within the proposed Lot 844 will be located approximately 50 metres from an existing public road
- The development property is located in an area that is not serviced by the Council's reticulated water supply and therefore any future residential dwelling development within the proposed Lot 844 will be required to provide a static water supply in accordance with Table 5.3d of Planning for Bush Fire Protection (2019). In this matter it is noted that a static water supply of at least 20,000 litres would be required which would be in addition to any storage provisions required to satisfy Council's development control provisions, stormwater engineering undertakings, or BASIX commitments.
- An amendment to the boundaries of the existing Positive Covenant that burdens Lot 11 DP1226788 will be required to be approved by Water NSW as the benefited agency. A separate Water Cycle Management Study report addressing potential water quality issues associated with the necessary clearing of forested vegetation has been undertaken by SOWDES and is presented under the title of a separate document.

Whilst this report has based its determinations on the location of a 'potential building envelope' within the proposed Lot 844 it is recognised that in accordance with Section 100B of the RF Act and Section 4.46 of the EP&A Act that any future development application for the construction of a residential dwelling within the Lot may be required to submit an independent bush fire assessment in support of any such development at the time of lodging a formal development application to Council if the future Lot is designated as containing bush fire prone land.

It is considered that the Planning Proposal to amend Part 4 – Principal Development Standards' – subsection '*4.2A - Erection of dwelling houses and dual occupancies on land in certain rural and environment protection zones'* of the Wingecarribee Local Environmental Plan (2010) in support of a boundary adjustment and the retention of an existing building entitlement within the proposed Lot 844 will be able to satisfy the requirements of Planning for Bush Fire Protection (2019), in particular the 'acceptable solutions', 'performance requirements' and 'specific objectives' contained in Chapter 5 of the publication.

Paul Johnson

Paul Johnson (JP)
Bachelor of Science Agriculture/Irrigation (CSU)
Graduate Diploma Bush Fire Protection (UWS)
(FPAA Member – Level 3 - BPAD27823)
Graduate Certificate Engineering – Water (UTS) GradIEAust

BPAD Bushfire Planning & Design Accredited Practitioner Level 3

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A. Legislation.

The proposed boundary adjustment is deemed to be a type of subdivision of residential land as defined in the EP&A Act (1979) and is therefore designated as 'integrated development' in accordance with Section 4.46 of the EP&A Act. As integrated development, a formal application must be submitted to the NSW Rural Fire Service under Section 100B of the RF Act seeking a 'Bush Fire Safety Authority' for the proposed development which will assess the proposal for compliance with PBP and the combined bush fire protection measures aimed at the protection of life and property. A 'Bush Fire Safety Authority' (BFSA) requires assessment of the development against set criteria as set out in Clause 44 of the Rural Fires Regulation (2008) which forms the basis of the assessment process adopted within this report. The relevant policies and guidelines that have been considered in the development assessment include:

- "Planning for Bush Fire Protection (2019)" (NSW Rural Fire Service)
- "AS3959 - 2018 Construction of Buildings in Bush Fire Prone Areas"
- Environmental Planning and Assessment Act (1979) - Sections 4.46 and 4.14
- NSW Rural Fires Act (1997) - Section 100B
- NSW Rural Fires Regulation (2008) - Clause 44
- Wingecarribee Local Environmental Plan (2010)
- Wingecarribee Shire Council Rural Lands Development Control Plan

B. Assessment Methodology.

The methodology employed to undertake a site assessment of the proposed development is consistent with that required for integrated development applications as defined in Section 4.46 of the EP&A Act and Section 100B of the RF Act, and contains the following detailed information as set out in Clause 44 of the RF Reg (as applicable):

1. **A description of the property**

- provide Lot No., DP of subject land
- street address with locality map
- zoning of subject land and any adjoining lands
- staging issues, if relevant, and description of the whole proposal
- aerial or ground photographs of subject land including contours and existing and proposed cadastre

2. **Identification of any significant environmental features - these could include the presence of:**

- riparian corridors
- SEPP 14 – Coastal Wetlands, SEPP 26 Littoral rainforests, SEPP 44 – Koala Habitat
- areas of geological interest
- environmental protection zones or steep lands (>18°)
- land slip or flood prone areas
- national parks estate or various other reserves.

3. **Details of threatened species, populations, endangered ecological communities and critical habitat known to the applicant**

- details of some threatened species can be found on the web (www.environment.nsw. gov.au)
- past and/or present studies or surveys for the area (eg local environment studies)
- documentation supplied to council in relation to flora and fauna

4. **Details of Aboriginal heritage known to the applicant**

- past surveys and information held by the DEC.

5. **A bush fire assessment for the individual Lots that addresses –**

- the classification of vegetation out to 140 metres from the development
    - provide a structural description consistent with the identification key in Keith D (2004) and PBP.
    - identify any past disturbance factors and any future intended land uses that could alter the vegetation classification in the future.
- an assessment of the effective slope to a distance of 100 metres
    - usually 5m contours will suffice for subdivisions, 10 metres should be used only if there has not been a survey undertaken by a registered land surveyor.
    - the effective slope is the slope under the vegetation assessed as being a hazard in relation to the development and not the slope within the asset protection zone.
- asset protection zones (including any management arrangements, any easements including those contained on adjoining lands)
- siting and adequacy of water (in relation to reticulation rates or where dedicated water storage will be required)
- capacity of public roads (especially perimeter roads and traffic management treatments)
- whether public roads link to fire trails and have two way access
- adequacy of access and egress
- adequacy of maintenance plans (eg; landscaping) and emergency procedures (especially SFPP developments)
- construction standards to be used (where non-conformity to the deemed-to-satisfy arrangement is envisaged, which aspects are not intended to conform)
- adequacy of sprinkler systems (only as an adjunct to other passive controls).

6. **An assessment of how the development complies with the acceptable solutions, performance requirements and relevant specific objectives within Chapter 4 of PBP.**

FOR ELECTRONIC VERSIONS OF THIS REPORT

PLEASE REFER TO THE ACCOMPANYING

'BUSH FIRE HAZARD ASSESSMENT SITE PLAN' – REF:

0050322-04A

Figure 1. Recent aerial view of the development property showing the proposed boundary adjustment and the nature of the vegetation formations within and surrounding the site. The captured area has a general fall from the southwest to the northeast with stormwater runoff from the southern aspect of the airfield operations directed into a formed channel that can be seen at the rear of the built structures adjacent to the runway.

Detailed responses to each of the above listed assessment criteria, and where deemed appropriate, an individual assessment of each Lot may be included:

B1. A description of the proposed development and property

The Berrima District Aero Club as the operators of the Mittagong Airfield are seeking to undertake a boundary adjustment between two portions of land that make up the airfield operations to enable separation and sale of a section of the site that is excess to the needs of the facility. The airfield is made up of two portions of land identified as Lot 11 DP1226788 and Lot 841 DP1253894 that have a combined area of 41.70 hectares with an existing residential building entitlement. The boundary adjustment would seek to secure the residential building entitlement within the separated portion of land - proposed Lot 844.

The development property is located within land zoned as 'C3 – Environmental Management' within the Land Zone Map – Sheet LZN_007J of the Wingecarribee LEP (2010) and therefore attracts residential dwelling permissibility 'with consent' subject to satisfying the minimum Lot size requirements. The development property is within an area mapped 'AB3' within the Lot Size Map – Sheet LSZ_007J of the Wingecarribee LEP (2010) which requires minimum Lot sizes of 40 hectares for Lots attracting residential dwelling building entitlement to which the proposed Lot 844 will not satisfy. It is the intention of the Planning Proposal to seek an amendment to the Wingecarribee Local Environmental Plan (2010) to effectively facilitate the transfer of the building entitlement from the existing holding to the proposed smaller Lot – Lot 844. The relevant provisions within the Wingecarribee LEP (2010) which the Planning Proposal seeks to amend are contained in 'Part 4 – Principal Development Standards' – subsection '*4.2A - Erection of dwelling houses and dual occupancies on land in certain rural and environment protection zones'*.

The development site is located approximately 2 kilometres to the east of the residential precincts on the southern aspect of the Mittagong township at the junction of Old South Road and Diamond Fields Road with Old South Road running adjacent to the northern boundary and Diamond Fields Road along the western boundary. The main entrance to the site is from the Old South Road frontage with a recessed gateway located approximately midway along the length of the runway formation, and there is a second but rarely used entrance on the western aspect of the site from the Diamond Fields Road traffic corridor with a gate located approximately midway along the length of the western boundary.

The subject property is formed from two parcels of land – Lot 11 DP1226788 which comprises 37.28 hectares, and Lot 841 DP1253894 at the eastern end of the site which comprises 4.434 hectares. The larger parcel of land - Lot 11 DP1226788 is comprised of two portions that are separated from each other by a 10.06 metre wide unformed road that is essentially an extension of the Diamond Fields Road corridor. The separation of the lands either side of the unformed road reserve results in a small triangular fillet in the western corner that is 1.277 hectares in area. The airfield operations are presently undertaken over the two parcels of land with approximately 530 metres of the 1.20 kilometre runway and verges on the eastern end of the runway falling into the smaller of the parcels of land – Lot 841 DP1253894.

The proposed boundary adjustment will ensure that the airfield operations are contained within a single parcel of land and separate the residual portion of land in the southwestern quarter of the current holding to its own title.

The site is an irregular shaped parcel of land that has operated as the Mittagong Airfield since it was originally established by the Royal Australian Airforce in the 1940's. The terrain throughout the northern portion of the site is relatively flat as it forms the operational area of the airfield's runways and includes associated administration buildings and hangers that are leased by private plane owners. The sealed portion of the runway which is formed in a southwest to northeast alignment measures approximately 1.20 kilometres in length and 10 metres wide. The southern half of the site which is effectively the remaining area to the south of the line of hanger buildings slopes from the crest of a small hill located in the southern corner of the holding in an arc from the southeast, through to the east, north and west, and then around to the southwest.

The vegetation formations throughout the property are quite varied with what is essentially managed grasslands within the lower portion of the site surrounding the airfield operations whilst the southern half of the site is set to a rather dense stand of dry sclerophyll forest formations. The northern and western aspects of the runway strip are used as a vegetation buffer zone from the adjoining road network whilst the strips of land either side of the runway are maintained with low growing vegetation formations that are regularly mown to facilitate operational and emergency management activities. The adjoining lands to the west and southwest of the site are predominantly set to rural activities with a blend of open grasslands and scattered occurrences of native and exotic trees whilst the lands to the south of the site have a continuation of the dry sclerophyll forest formations.

The terrain throughout the southern half of the site which is effectively the area to the south of the line of hanger buildings slopes from the crest of a small hill located in the southern corner of the holding in an arc from the southeast, through to the east, north and west, and then around to the southwest. The average slope of the terrain from the crest of the hill down to the airfield operations approximates 6.50° however the bottom half of the slope is slightly less at an average grade of 5°. The terrain immediately around the 'potential development envelope' within the proposed Lot 844 has a general fall from the southeast toward the northwest between 5° and 10° and begins to 'plateau-out' to less than 5° on the northern aspect. The grasslands areas to the north of the 'potential development envelope' where the surface water drainage channel is located represents a general change in grade and slope direction tending to fall toward the northeast at less than 3°.

The forested vegetation within the portion of the land holding to the south of the line of hangers is covered by a Positive Covenant under Section 88B of the Conveyancing Act of 1919 which benefits Water NSW (formerly the Sydney Catchment Authority) for the retention and protection of approximately 15.09 hectares of native vegetation within the current holding for water quality purposes. The Positive Covenant does however have a clause that allows for the clearing of vegetation 'only to the extent necessary' to establish a residential dwelling and suitable asset protection zones as required for the purposes of bush fire protection under the provisions of the

Rural Fires Act 1997. Information submitted as part of the Planning Proposal for the proposed boundary adjustment and dwelling entitlement has identified a suitable site for the construction of a future dwelling within the smaller portion of land that is to be separated from the airfield operations. The site is located approximately 50 metres off the Diamond Fields Road frontage and on the margins of the forested vegetation to minimise the amount of area that would need to be cleared for bush fire protection purposes. The amount of existing forested area under the protection of the Positive Covenant within the proposed Lot 844 seeking the residential dwelling entitlement will represent approximately 9.62 hectares of the current 15.09 hectares, however this will be reduced by approximately 6,800m² to facilitate the future dwelling envelope and surrounding curtilage including the associated asset protection zones for bush fire protection purposes. It is noted that all land area calculations quoted in the above details are subject to the final boundary locations and the extent of clearing necessary to provide a suitable asset protection zone around the footprint of a future dwelling which for the purposes of the above calculations is assumed to be 600m² and achieving a bush fire attack level rating that does not exceed 'BAL-29'.

Stormwater drainage associated with the site is dominated by a natural water course that enters from the western aspect and traverses toward the northeastern corner of the holding along the rear of the line of hangers and other buildings. The drainage system commences in rural lands on the opposite side of the Diamond Fields Road traffic corridor and passes under the road via a single cell concrete boxed culvert and headwall that is located approximately 60 metres north of the western entrance to the site. Overland stormwater drainage entering the western aspect of the site is partially attenuated by a small offline dam located approximately 50 metres inside the boundary with the dam overflow and overland flows in larger rain events being directed into a formed channel that runs parallel to the alignment of the runway behind the line of hangers and other buildings. Surface water runoff from the crest of the hill in the southern corner of the site flows into a broad depression that flows in a more north-northeasterly pattern and begins to spread-out nearing the bottom of the hill as the terrain begins to flatten. The formed drainage channel runs for the entire length of the runway to direct all sources of surface water from the western and southern aspects away for the main operational areas. Stormwater runoff generated within the flatter operational areas of the airfield is shed off the runway surface to the verges either side of the formation and there is a slight fall from the west to the east that directs that flow of water which is generally fairly shallow away from the hangers and other buildings to the eastern end of the site where natural drainage systems are located.

For the purposes of a stormwater quality assessment and bush fire protection measures a 'potential dwelling envelope' of 600m² has been identified within the western portion of the proposed Lot 844. The site will utilise an existing gated entrance along the western boundary of the Lot, and the building envelope will be 50 metres inside the boundary. The site was selected because of its short travel distance from the Diamond Fields Road traffic corridor, and the fact that it is only surrounded by forested vegetation on the upslope southern aspect with partial forested vegetation to the east and west, and open grasslands to the north.

The amount of forested vegetation required to be cleared for the establishment of a building envelope and associated asset protection zone for bush fire protection purposes is minimised by the proposed location of the 'potential dwelling envelope' as the southern aspect of the site which contains the greater portion of forested vegetation is upslope and therefore requires a lesser buffer separation distance for the asset protection zone than if it were downslope. The eastern and western aspects of the site are slightly downslope of the building envelope and only contain small amounts of forested vegetation, whilst the grasslands to the north of the site are deemed a lesser form of bush fire threat and therefore only require small buffer zones.

The amount of forested vegetation protected by the existing Positive Covenant on the subject site is 15.09 hectares of which approximately 9.62 hectares will be contained within the proposed Lot 844 after the boundary adjustment is registered. The required asset protection zone for bush fire protection associated with the 'potential development envelope' is 6,950m² of which 5,460m² is located within the area delineated by the Positive Covenant, the remaining area is located within the grasslands to the north of the delineated zone. The shape of the asset protection zone around the 'potential development envelope' is not precisely square to the footprint of the building envelope as the corners of the setbacks to the margins of the vegetation are rounded however it is difficult to ensure that selective clearing of vegetation within the boundaries of the required asset protection zone follow the outer limits of the required area therefore a slightly larger area that is 'squared-off' to the footprint of the building envelope is proposed. The 'squaring' of the proposed clearing area to the orientation of the building envelope and the proposed boundaries of the Lot will also facilitate easier definition of the future area to be maintained under the protection of the Positive Covenant.

The identified 'potential dwelling envelope' within the proposed Lot 844 has been specifically identified to ensure that any future dwelling development can be undertaken without exposing the building, occupants, or emergency services personnel to radiant heat levels exceeding 29kW/m² in accordance with the provisions of Chapter 5, *Table 5.3b – Asset Protection Zones* of 'Planning for Bush Fire Protection (2019). The site of the nominated 'potential dwelling envelope' has also been selected to ensure that the required asset protection zones determined by the combination of vegetation formation and effective slope on the various aspects are able to be contained within the boundaries of the property thereby eliminating any need to create vegetation management covenants.

The development property is not serviced by a Council maintained reticulated water supply and therefore any future residential dwelling development within the proposed Lot 844 will be required to provide a dedicated water supply for firefighting purposes in accordance with Table 5.3d *'Water supply requirements for non-reticulated development or where reticulated water supply cannot be guaranteed'*, Planning for Bush Fire Protection (2019), page 48. It is noted that the proposed Lot 844 will be greater than 1 hectare in area and therefore in accordance with Table 5.3d will require a minimum dedicated water storage provision of 20,000 litres. The requirements for dedicated firefighting water supply are in excess of any storage provisions to satisfy Council's standard stormwater engineering requirements or BASIX commitments.

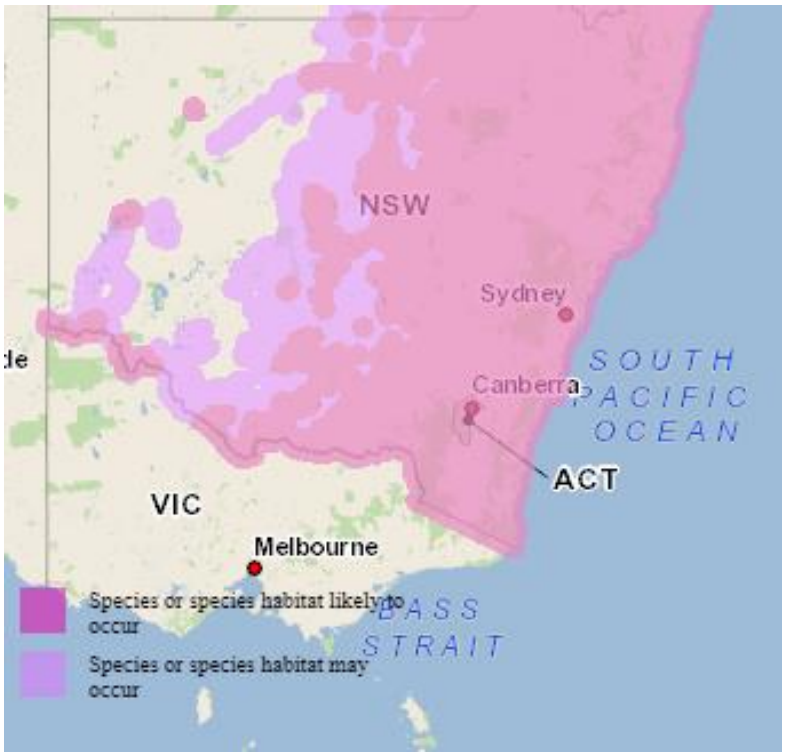
Figure 1. Portion of the Wingecarribee Shire Council 'Bush Fire Mapping' showing 'Category 1' (red shading) vegetation formations and associated buffer zones (yellow) within and surrounding the development property.

Refer the accompanying Bush Fire Hazard Assessment Site Plan; Ref: 0050322-04A for the proposed layout of the adjusted boundaries and the location of the 'potential development envelope' within the proposed Lot 844.

B2. Identification of any significant environmental features

There are no identified SEPP 14 - Coastal Wetlands, SEPP 26 - Littoral rainforests, or national parks within or surrounding the proposed development property.

Koala Habitat Protection SEPP (2021). Recent changes to the Commonwealth Government environmental laws (February 2022) have listed koalas in NSW as 'endangered' and their habitats as 'vulnerable'. The geographical area surrounding the development land is listed as 'known' or 'likely' to provide koala habitat however it is predicted that no koala populations exist within or adjacent to the subject development property due to the absence of any confirmed sightings of the koalas within the immediate area and the level of anthropogenic changes and influences to the natural environment.



Map produced by the Commonwealth Government showing the distribution of koala habitats throughout southeastern Australia, and in particular NSW, where the koala is now listed as an 'endangered species'.

B3. Details of threatened species, populations, endangered ecological communities and critical habitat known to the applicant

It is considered that there are no significant threatened species, populations, endangered ecological communities, critical habitat or threatening processes associated with the proposed development or the land upon which any future residential developments are proposed to be undertaken. The development area has been significantly disturbed by historical rural activities and anthropogenic influences such that the likelihood of any significant threatened species, populations, endangered ecological communities or critical habitat being present within the existing or nominated development envelope is considered remote. This assumption however does not discount the possibility that certain migratory birds and transient animals may from time to time be sighted on the property or that various plant species may proliferate during favourable weather and seasonal conditions which were not in place during the period of the site survey.

A search of the NSW Office of Environment and Heritage records for the area bounded by a 10 kilometre square from the centre of the proposed development has compiled a list of endangered ecological communities and key threatening processes that may be associated with the site which is included as Appendix A at the conclusion of this report.

B4. Details of Aboriginal heritage known to the applicant

A search of the NSW Office of Environment and Heritage "*Aboriginal Heritage Information Management System*" (AHIMS) records indicate that there are no known or registered Aboriginal Heritage sites or places within 50 metres of the development property (refer to the search results included as Appendix A). It is presumed, based on discussions with the property owners that there are no decisions pending regarding possible future listing of Aboriginal Heritage Places within the proposed development area.

It is considered that the proposed Lot 844 seeking to retain the residential dwelling entitlement will be able to satisfy the requirements of Planning for Bushfire Protection (2019) without any significant constraints and it is for this reason that a further detailed assessment of the Lot is not included within the context of this assessment, however a BAL certificate has been prepared based on the location of the 'potential development envelope' which is presented in Section B5. A summary of how the development 'as a whole' complies with the acceptable solutions, performance requirements, and specific objectives of Chapter 5 of *Planning for Bushfire Protection* (2019) has been undertaken and is included in Section B6 of this assessment.

B5. Bush Fire Attack Level Certificate for Proposed Lot 844

Site Address Details	Old South Road, Mittagong. NSW. 2575		
Property Details	Lot 11 DP1226788 & Lot 841 DP1253894		
Local Council Area	Wingecarribee Shire Council	FFDI	100

Type of Proposal		Land Zoning & Use	
	New dwelling		Urban residential / Village
✓	Residential Subdivision / Boundary Adjustment	✓	Rural / other

Mapped Vegetation Category	Category 1 - Areas of forest, woodlands, heaths (tall and short), forested wetlands and timber plantations.

Proximity, Aspect and Vegetative Formation in Relation to the Proposed Development

Category	North Arc NWŸ NŸ NE		South Arc SEŸ SŸ SW		East Arc NEŸ EŸ SE		West Arc NWŸ WŸ SW	
Distance	metres	**25**	metres	**35**	metres	**35**	metres	**35**
BAL rating	BAL	**19**	BAL	**19**	BAL	**29**	BAL	**29**
Vegetation formation within 140 metres		Forest	✓	Forest	✓	Forest	✓	Forest
		Woodland		Woodland		Woodland		Woodland
		Tall heaths		Tall heaths		Tall heaths		Tall heaths
		Short heaths		Short heaths		Short heaths		Short heaths
		Rainforest		Rainforest		Rainforest		Rainforest
	✓	Grasslands		Grasslands		Grasslands		Grasslands
		Managed land		Managed land		Managed land		Managed land
Slope under the hazard	Downslope >0 to 5		Upslope / flat		Downslope >0 to 5		Downslope >0 to 5	

Overall Bush Fire Attack Level (BAL) and AS3959 – 2018 Building Construction Requirements

The highest BAL Rating that this development must achieve is:	BAL-29	AS3959 – 2018 Requirement	Section 7

*** Specific variations exist in NSW in the application of Sections 5 and 6 of AS3959-2018 Construction of Buildings in Bush Fire Prone Areas. Refer to Chapter 7.5.2 of Planning for Bush Fire Protection [2019] (page 70)**

Dedicated Water Supply - Table 5.3d of Planning for Bush Fire Protection [2019]

Development Type	Water Supply Requirement	Planned	Existing
Large rural / lifestyle Lots (>10,000m²)	20,000L / Lot	☑	☐

APZ Requirements – Table A1.12.2 of Planning for Bush Fire Protection [2019]

			Asset Protection Area			
			Inner	Outer		
Direction	Vegetation	Slope	(metres)		Planned	Existing
North	Grasslands	Downslope >0 to 5	25	0	☑	☐
South	Forest	Upslope / flat	25	10	☑	☐
East	Forest	Downslope >0 to 5	25	10	☑	☐
West	Forest	Downslope >0 to 5	25	10	☑	☐

B6. An assessment of how the development complies with the acceptable solutions, performance requirements and relevant specific objectives within Chapter 5 of PBP (2019)

TABLE 5.3a - ASSET PROTECTION ZONES & BUILDING CONSTRUCTION					
Performance Criteria		**Acceptable Solutions**		**Proposed Development-Specific Measures**	**Satisfies the Acceptable Solution**
Intent of measures: to provide sufficient space and maintain reduced fuel loads to ensure radiant heat levels at the buildings are below critical limits and prevent direct flame contact.					
The intent may be achieved where:					
5.3a(1)	Potential building footprints must not be exposed to radiant heat levels exceeding 29 kW/m² on each proposed lot.	a	APZs are provided in accordance with Tables A1.12.2 and A1.12.3 based on the FFDI.	An asset protection zone has been identified around the location of the nominated dwelling site that would not expose any part of the building to a radiant heat level exceeding 29kW/m² or BAL-29.	Yes
5.3a(2)	APZ's are managed and maintained to prevent the spread of fire to the building.	a	The APZ is managed in accordance with the requirements of Appendix 4 of PBP(2019) ***	It will be a requirement of a future dwelling development within the proposed Lot 844 to establish and maintain the area around the footprint of the dwelling as an asset protection zone in accordance with Appendix 4 and the NSW Rural Fire Service standards for asset protection zones.	Yes
5.3a(3)	The APZ is provided in perpetuity	a	APZ are wholly within the boundaries of the development site	The location of the dwelling within the proposed Lot 844 will ensure that the required asset protection zones around the footprint of the dwelling are within the boundaries of the property.	Yes
5.3a(4)	APZ maintenance is practical, soil stability is not compromised and the potential for crown fires is minimised.	a	APZ's are located on lands with a slope less than 18°.	The nominated dwelling site and the surrounding lands are located on a site slope of less than 10° and therefore satisfies this condition.	Yes

LANDSCAPING					
5.3a(5)	Landscaping is designed and managed to minimise flame contact and radiant heat to buildings, and the potential for wind-driven embers to cause ignitions.	a	Landscaping is in accordance with the requirements of Appendix 4 of PBP(2019) ***	Any future dwelling development within the proposed Lot 844 would be required to provide a detailed landscaping plan that is suitable for developments in bush fire prone areas at the time of lodging a formal application to Council for the construction of a residential dwelling. The landscaping plan would be an effective tool to ensure compliance with this provision.	Yes
		b	Fencing is constructed in accordance with section 7.6 of PBP2019	The development property is located within a peri-urban environment and is surrounded by larger lifestyle and rural holdings where traditional rural fencing systems are still required. Any fencing associated with the dwelling and /or boundaries will be constructed with either a wire netting or hinge-joint product that will be fixed to strands of plain wire with steel strainers and intermediate posts.	Yes

*** http://www.rfs.nsw.gov.au/__data/assets/pdf_file/0010/13321/Standards-for-Asset-Protection-Zones.pdf

TABLE 5.3b – ACCESS – GENERAL REQUIREMENTS					
Performance Criteria		**Acceptable Solutions**		**Proposed Development-Specific Measures**	**Satisfies the Acceptable Solution**
Intent of measures: to provide safe operational access to structures and water supply for emergency services, while residents are seeking to evacuate from an area.					
The intent may be achieved where:					
5.3b(1)	Firefighting vehicles are provided with safe all-weather access to structures	a	Property access roads are two-wheel drive, all-weather roads	Any future development within the proposed Lot 844 will be required to provide suitable access roads inside the boundaries that are capable and suitable of handling traffic in all types of weather conditions.	Yes
		b	Perimeter roads are provided for residential subdivisions of three or more allotments	The proposed development is for a boundary adjustment between two existing portions of land that does not result in an increase of Lot numbers	Not applicable
		c	Subdivisions of three or more allotments have more than one access in and out of the development	The proposed development is for a boundary adjustment between two existing portions of land that does not result in an increase of Lot numbers	Not applicable
		d	Traffic management devices are constructed to not prohibit access by emergency services vehicles	There are no traffic management structures associated with the proposed development	Not applicable

		e	Maximum grades for sealed roads do not exceed 15° and an average grade of not more than 10° or other gradient specified by road design standards, whichever is the lesser gradient	The proposed boundary adjustment does not require the construction of any new roads. Access to the site is from an existing Council maintained bitumen sealed road.	Not applicable
		f	All roads are through roads	The proposed boundary adjustment does not require the construction of any new roads. Access to the site is from an existing Council maintained bitumen sealed road.	Not applicable
		g	Dead end roads are not recommended, but if unavoidable, are not more than 200 metres in length, incorporate a minimum 12 metres outer radius turning circle, and are clearly sign posted as a dead end	The proposed boundary adjustment does not require the construction of any new roads. Access to the site is from an existing Council maintained bitumen sealed road. .	Not applicable
		h	Where kerb and guttering is provided on perimeter roads, roll top kerbing should be used to the hazard side of the road	The proposed boundary adjustment does not require the construction of any new roads. Access to the site is from an existing Council maintained bitumen sealed road.	Not applicable

		i	Where access/egress can only be achieved through forest, woodland and heath vegetation, secondary access shall be provided to an alternate point on the existing public road system	The proposed boundary adjustment does not require the construction of any new roads. Access to the site is from an existing Council maintained bitumen sealed road.	Not applicable
		j	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.	The proposed boundary adjustment does not require the construction of any new roads. Access to the site is from an existing Council maintained bitumen sealed road.	Not applicable
5.3b(2)	The capacity of access roads is adequate for firefighting vehicles.	a	The capacity of perimeter and non-perimeter road surfaces and any bridges/causeways is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes); bridges / causeways are to clearly indicate load rating.	The proposed boundary adjustment does not require the construction of any new roads. Access to the site is from an existing Council maintained bitumen sealed road which is suitable for carrying fully loaded firefighting vehicles as it is used for the transport of livestock and general farming equipment on a regular basis.	Yes

5.3b(3)	There is appropriate access to water supply.	a	Hydrants are located outside of parking reserves and road carriageways to ensure accessibility to reticulated water for fire suppression	The development site is not serviced by a Council maintained reticulated water supply.	Yes
		b	Hydrants are provided in accordance with the relevant clauses of AS 2419.1:2005 - *Fire hydrant installations System design, installation and commissioning*	The development site is not serviced by a Council maintained reticulated water supply.	Yes
		c	There is suitable access for a Category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available.	Any future dwelling development within the proposed Lot 844 will need to provide a suitable access within 4 metres of a static water supply.	Yes

PERIMETER ROADS					
5.3b(4)	Perimeter 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	a	Are two way sealed roads	The proposed boundary adjustment does not require the construction of any new perimeter roads hence the sub-items (a) to (i) are not applicable.	Not applicable
		b	Minimum 8 metre carriageway width kerb to kerb		Not applicable
		c	Parking is provided outside of the carriageway width		Not applicable
		d	Hydrants are located clear of parking areas		Not applicable
		e	Are through roads, and these are linked to the internal road system at an interval of no greater than 500 metres		Not applicable
		f	Curves of roads have a minimum inner radius of 6 metres		Not applicable
		g	The maximum grade road is 15° and average grade of not more than 10°		Not applicable
		h	The road crossfall does not exceed 3°		Not applicable

		i	Minimum vertical clearance of 4 metres to any overhanging obstructions, including tree branches, is provided		Not applicable

NON-PERIMETER ROADS					
5.3b(5)	Access roads are designed to allow safe access and egress for firefighting vehicles while residents are evacuating.	a	Minimum 5.5 metre carriageway width kerb to kerb	The proposed boundary adjustment does not require the construction of any non-perimeter roads hence the sub-items (a) to (g) are not applicable.	Not applicable
		b	Parking is provided outside of the carriageway width		Not applicable
		c	Hydrants are located clear of parking areas		Not applicable
		d	Roads are through roads, and these are linked to the internal road system at an interval of no greater than 500 metres		Not applicable
		e	Curves of roads have a minimum inner radius of 6 metres		Not applicable
		f	The road crossfall does not exceed 3°		Not applicable
		g	A minimum vertical clearance of 4 metres to any overhanging obstructions, including tree branches, is provided.		Not applicable

PROPERTY ACCESS					
5.3b(6)	Firefighting vehicles can access the dwelling and exit the property safely.	a	There are no specific access requirements in an urban area where an unobstructed path (no greater than 70m) is provided between the most distant external part of the proposed dwelling and the nearest part of the public access road (where the road speed limit is not greater than 70kph) that supports the operational use of emergency firefighting vehicles.	This condition is not applicable to the development even though the distance from the public road system to the dwelling envelope is only 50 metres as the development property is accessed from a rural road where the speed limit is sign-posted at 80kph.	No
		In circumstances where the above cannot occur, the following requirements apply:			
		b	Minimum 4m carriageway width	The access carriageway between the public road system and the dwelling envelope will be approximately 50 metres long and will be formed with a minimum carriageway width of 4 metres within a 6 metre wide corridor.	Yes

		c	In forest, woodland and heath situations, rural property access roads have passing bays every 200m that are 20m long by 2m wide, making a minimum trafficable width of 6m at the passing bay	The access carriageway between the public road system and the dwelling envelope will be approximately 50 metres long and will be formed with a minimum carriageway width of 4 metres within a 6 metre wide corridor. The majority of the alignment of the access carriageway will be located within the required asset protection zone surrounding the dwelling.	Yes
		d	A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches	The requirements for a clearance of 4 metres in the vertical plane will need to be established and satisfied during the site establishment works associated with the construction of a new dwelling.	Yes
		e	Provide a suitable turning area in accordance with Appendix 3	A suitable turning area will need to be provided around the footprint of the dwelling at the time of development to satisfy this condition	Yes
		f	Curves have a minimum inner radius of 6m and are minimal in number to allow for rapid access and egress	The construction of the internal turning area around the footprint of the dwelling at the time of development to satisfy this condition.	Yes
		g	The minimum distance between inner and outer curves is 6m	The construction of the internal turning area around the footprint of the dwelling at the time of development to satisfy this condition.	Not applicable
		h	The crossfall is not more than 10°	The access carriageway will be constructed with a general crossfall of 3° to facilitate stormwater runoff.	Yes

		i	Maximum grades for sealed roads do not exceed 15° and not more than 10° for unsealed roads	The access carriageway will be constructed with a longitudinal gradient of les than 5°.	Yes
		j	A development comprising more than three dwellings has access by dedication of a road and not by right of way.	The proposed development is for a boundary adjustment between two existing portions of land that does not result in an increase of Lot numbers	Not applicable
			Note: Some short constrictions in the access may be accepted where they are not less than 3.5m wide, extend for no more than 30m and where the obstruction cannot be reasonably avoided or removed. The gradients applicable to public roads also apply to community style development property access roads in addition to the above.		

TABLE 5.3c - SERVICES – WATER, GAS & ELECTRICITY					
Performance Criteria		**Acceptable Solutions**		**Proposed Development-Specific Measures**	**Satisfies the Acceptable Solution**
Intent of measures: to provide adequate services of water for the protection of buildings during and after the passage of a bush fire, and to locate gas and electricity so as not to contribute to the risk of fire to a building.					
The intent may be achieved where:					
WATER SUPPLIES					
5.3c(1)	An adequate water supply for firefighting purposes is installed and maintained	a	Reticulated water is to be provided to the development where available	The development property is not serviced by a Council maintained reticulated water supply.	Not applicable
		b	A static water and hydrant supply is provided for non-reticulated developments or where reticulated water supply cannot be guaranteed	Any future dwelling development within the proposed Lot 844 will be required to provide a static water supply in a storage tank made of non-combustible materials such as concrete or metal.	Yes
		c	Static water supplies shall comply with Table 5.3d.	Any future dwelling development within the proposed Lot 844 will be required to provide a static water supply of 20,000 litres in accordance with Table 5.3d of Planning for Bush Fire Protection (2019)	Yes
5.3c(2)	Water supplies are located at regular intervals. The water supply is accessible and reliable for firefighting operations.	a	Fire hydrant spacing, design and sizing comply with the relevant clauses of AS 2419.1:2005	The development property is not serviced by a Council maintained reticulated water supply.	Not applicable
		b	Hydrants are not located within any road carriageway	The development property is not serviced by a Council maintained reticulated water supply.	Not applicable

		c	Reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter roads.	The development property is not serviced by a Council maintained reticulated water supply.	Not applicable
5.3c(3)	Flows and pressure are appropriate.	a	Fire hydrant flows and pressures comply with the relevant clauses of AS 2419.1:2005.	The development property is not serviced by a Council maintained reticulated water supply.	Not applicable
5.3c(4)	The integrity of the water supply is maintained.	a	All above-ground water service pipes are metal, including and up to any taps	Any future dwelling development within the proposed Lot 844 will need to satisfy this condition.	Yes
		b	Above-ground water storage tanks shall be of concrete or metal.	Any future dwelling development within the proposed Lot 844 will be required to provide a static water supply in a storage tank made of non-combustible materials such as concrete or metal.	Yes

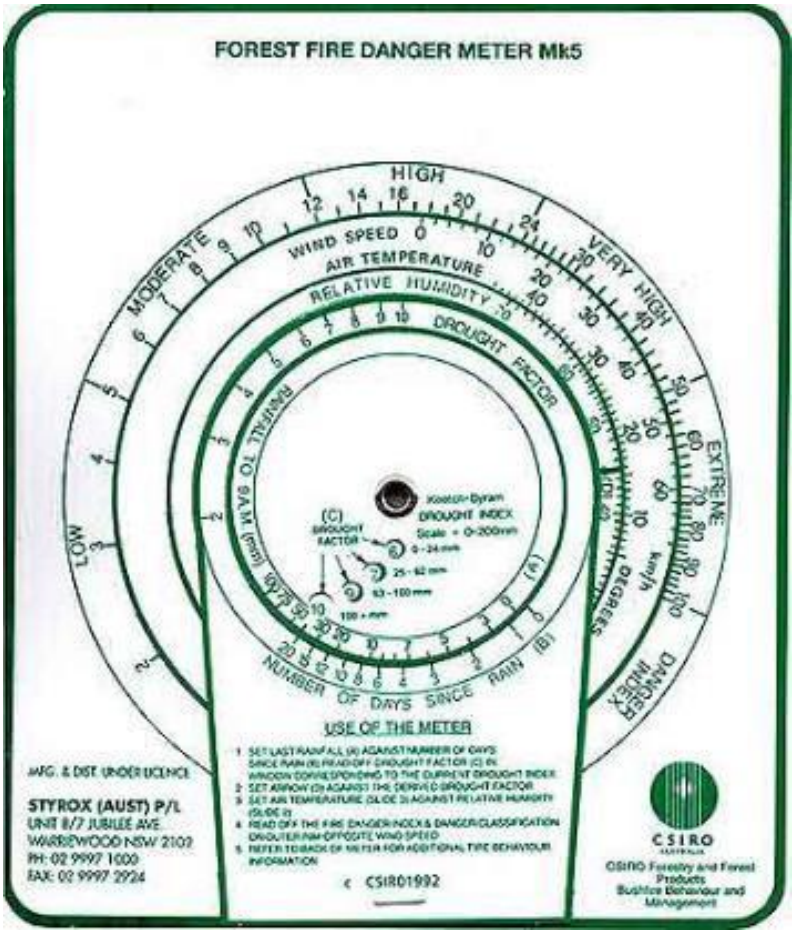
ELECTRICITY					
5.3c(5)	Location of electricity services limits the possibility of ignition of surrounding bushland or the fabric of buildings	a	Where practicable, electrical transmission lines are underground.	The supply of mains electricity to any future development within the proposed Lot 844 will need to be in accordance with the supply agencies requirements for bush fire prone areas, however where possible it is preferred that the new supply will be underground.	Yes
		b	Where overhead electrical transmission lines are proposed: - lines are installed with short pole spacing (30 metres), unless crossing gullies, gorges or riparian areas; and - no part of a tree is closer to a power line than the distance set out in accordance with the specifications in ISSC3 *Guideline for Managing Vegetation Near Power Lines*.	If overhead power lines are installed then they are to be undertaken in accordance with the supply agencies requirements for developments within bush fire prone areas.	Yes

GAS					
5.3c(6)	Location of gas services will not lead to ignition of surrounding bush land or the fabric of buildings.	a	Reticulated or bottled gas is installed and maintained in accordance with '*AS 1596 – 2014 – The Storage and Handling of LP Gas'* and the requirements of relevant authorities. Metal piping is to be used.	The development property is not serviced by a reticulated gas supply therefore any future residential dwelling within the proposed Lot 844 seeking to install gas operated appliances will need to install bottled LPG.	Yes
		b	All fixed gas cylinders are kept clear of all flammable materials to a distance of 10 metres and shielded on the hazard side of the installation.	Any future development within the proposed Lot 844 will need to satisfy this condition if applicable at the time of residential dwelling development	Yes
		c	Connections to and from gas cylinders are metal.	Any future development within the proposed Lot 844 will need to satisfy this condition if applicable at the time of residential dwelling development	Yes
		d	Polymer sheathed flexible gas supply lines are not to be used.	Any future development within the proposed Lot 844 will need to satisfy this condition if applicable at the time of residential dwelling development	Yes
		e	Above-ground gas service pipes are metal, including and up to any outlets.	Any future development within the proposed Lot 844 will need to satisfy this condition if applicable at the time of residential dwelling development	Yes

C. Fire Weather.

The FDI (Fire Danger Index) rating system was developed by McArthur (CSIRO) in the 1960's to help predict the chance of a fire starting, its rate of spread, its intensity and the difficulty of its suppression according to the various combinations of air temperature, relative humidity, wind speed and both the long and short term drought effects. An FDI of 100 was considered to be the maximum danger rating given the worst possible combination of fire conditions when the Forest Fire Danger Index was initially introduced, and still stands as the fire weather indicator for all NSW local government areas despite the fact that the maximum potential FDI ratings have been calculated well in excess of 100 in some weather districts. The warning classifications have been updated recently in line with improved knowledge of weather and fire behaviour to the extent that the classification system introduced a new level of danger being "Catastrophic" which reflects conditions in excess of an FDI of 100.

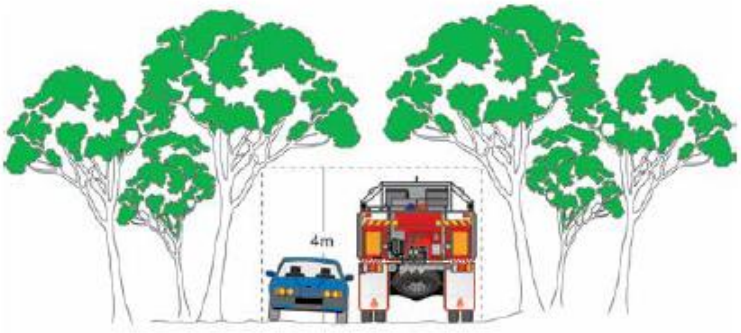
The Wingecarribee Shire Council is located within the Illawarra / Shoalhaven fire area of NSW and therefore has an FDI rating of 100 assumed as a 1:50 year event.



D. General design and construction considerations for each Lot as 'infill' developments under Section 4.14 of the Environmental Planning and Assessment Act 1979.

1. Access and Egress.

Table 7.4a 'Access' of "Planning for Bush Fire Protection" (2019) requires that an alternate escape route be made available if the distance from the nearest arterial road to the dwelling site is greater than 200 metres, and that the minimum width for internal access roads be four metres plus one metre either side which is maintained to provide a clear opening of four metres between ground level and any overhanging vegetation in accordance with the below Figure. There must also be a turning provision of not less than 12 metres near to the dwelling site which will allow emergency services vehicles clear access to the dwelling.



General construction requirements for internal property access roads in rural areas as prescribed by the NSW Rural Fire Service

2. Water Supply.

In rural areas where the development block is not located within a service area that has access to reticulated water supply, the provision of a dedicated and static water supply is considered essential. The provision of a dedicated waters supply in rural areas provides opportunities for fire fighters to replenish their tanker supplies and also aims to ensure that there is adequate water provisions for the property owners to undertake their own protection activities. As a general rule the capacity of the static water requirement is based on the Lot size and the type of development, with the typical requirements summarised in Table 1.

It should be emphasised that the water requirements listed in Table 1 are a minimum requirement, and where site specific firefighting systems have been installed such as fire hose reels, drencher systems and other fire suppression measures, additional water storage will be required - and the overall capacity of this additional requirement should be based on a site specific design. The minimum water storage requirements applicable for all Lots in this particular development without any site-specific fire protection detail is highlighted in Table 1.

Table 1. Water supply requirements - adopted from Table 5.3d of "Planning for Bush Fire Protection (2019).

Development Type	Residential Lots <1000m²)	Residential Lots (1000 - 10,000m²)	Large Rural / Lifestyle Lots (>10,000m²)	Multi-housing dwellings and Dual Occupancy
Water Requirement	5,000 litres / Lot	10,000 litres / Lot	20,000 litres / Lot	5,000 litres / Unit

The following items are adopted from Table 7.4a of "Planning for Bush Fire Protection (2019)" and are considered mandatory installation conditions where they are applicable to the development:

- where no reticulated water supply is available, water for firefighting purposes is provided in accordance with Table 5.3d;
- a connection for firefighting purposes is located within the IPA or non-hazard side and away from the structure; 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;
- 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 of AS 3959);
- unobstructed access can be provided at all times;
- underground tanks are clearly marked;
- tanks on the hazard side of a building are provided with adequate shielding for the protection of firefighters;
- 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, and installed in accordance with the relevant clauses of AS 2441:2005.
- Where a Static Water Supply (SWS) is provided, an "SWS" sign should be installed in a visible location on the street front.

From a firefighting point of view, any source of available water may be used during a bush fire event and tanks are not always the most practical option. In light of the above, and the increasing demand for sustainable and efficient use of our water resources, the NSW RFS prefers that water is solely dedicated for firefighting purposes. As such, water holding structures such as tanks, swimming pools and dams can be considered as long as they are accessible, reliable and adequate. Nevertheless, where a water supply is provided it must be available for the lifetime of the development.
Water capacities, access for firefighters (tanker or pedestrian) and the provision of appropriate connections must also be considered when determining if a proposed water source is suitable. Where a Static Water Supply (SWS) is provided, a SWS sign should be installed in a visible location on the street front. Regular testing of firefighting equipment should also occur to ensure that it is maintained in working order.

Source: (Section 3.5, page 30 of Planning for Bush Fire Protection (2019).

It is also important to remember that whilst the protection and defensive measures addressed in this report are principally focused on the requirements for bush fire events, other fires including general household fires can occur at any time and therefore the provisions of this report are intended to extend to all probable fire events. It is for this reason that firefighting measures, such as firefighting pumps being connected to the water supply, should be in place at all times and not simply in the recognised bush fire season.

Example of a storz connection associated with a dedicated water storage tank used for dedicated firefighting purposes and a standard "Static Water Supply" sign to be placed at the front of the property.

3. Gas Supply.

Gas and other combustible materials should not be stored within the inner protection area of the dwelling or close to significant stands of vegetation formations. In particular, Table 7.4a of "Planning for Bush Fire Protection (2019)" states the following:

- reticulated or bottled gas is installed and maintained in accordance with AS/NZS 1596:2014 and 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
- polymer sheathed flexible gas supply lines are not used
- above-ground gas service pipes are metal, including and up to any outlets.

4. Vegetation Assessment.

The vegetation around the dwelling site should be classified using recommended references including "Ocean Shores to Desert Dunes" (Keith, 2004), "AS3959 - 2018 Construction of Buildings in Bushfire Prone Areas", and "Planning for Bushfire Protection" (2019). Where applicable, the dominant vegetation types and formations should be identified for each aspect or elevation of the proposed dwelling to a distance of 140 metres, or the nearest distance if the assessable vegetation formation is less than 140 metres from the development site.

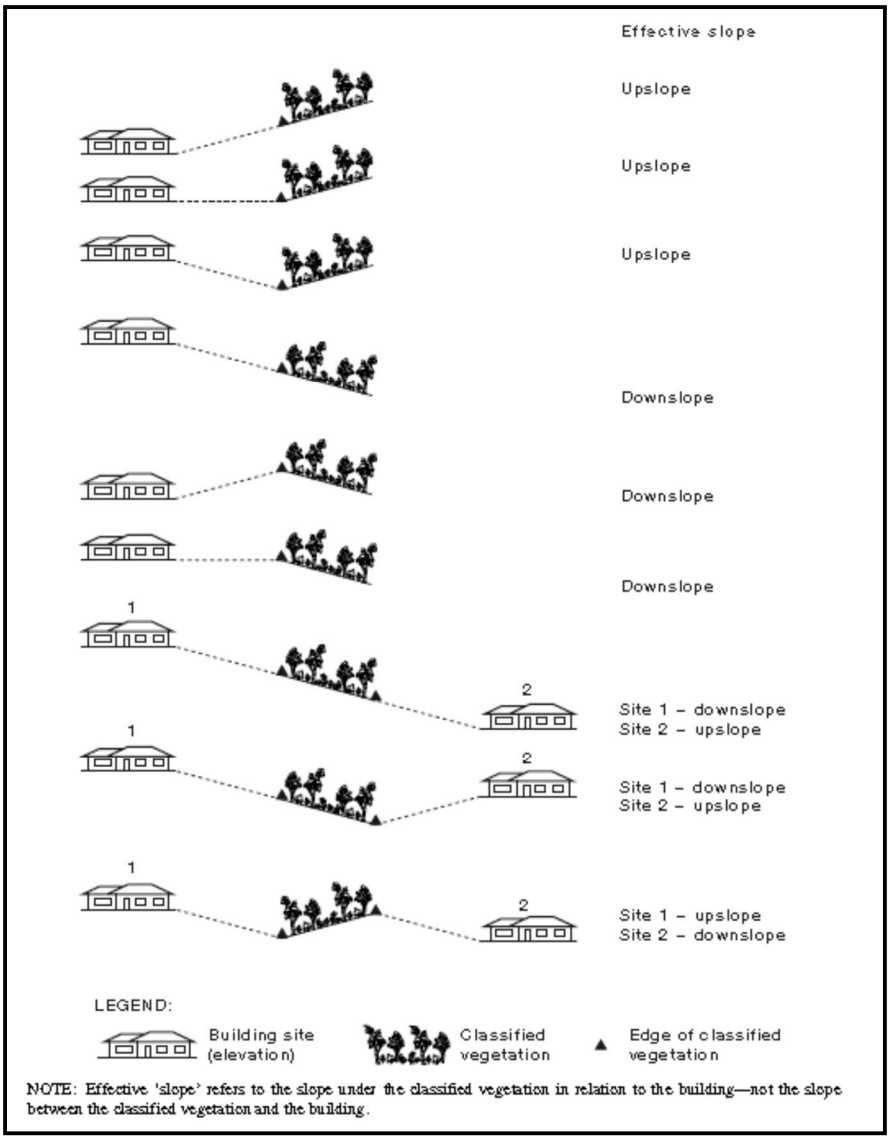
As a general rule of the assessment process, the vegetation assessment that is deemed manageable by the property owners shall only be conducted to the extents of the boundaries of the subject property if the distance to the property boundary is less than 140 metres as the property owners normally do not have any direct control on the vegetation that lies in adjacent properties.

Where the distance from the development site to the property boundary is less than 140 metres and the assessable vegetation formation is immediately on the neighbouring side of that boundary, it is presumed that for the lifetime of the development that this vegetation will be a 'constant' within the assessment process irrespective of any agreement between the two property owners to undertake any clearing or maintenance within the area. An exception applies if the area is to be maintained by a supply authority as part of a service easement - such as overhead power lines.

5. Asset Protection Zone.

Asset protection zones are areas of reduced fuel accumulation between the assessable vegetation classification and the dwelling site. This separation area provides a defendable space whereby persons attempting to combat the fire will have some protection from the radiant heat that the burning fuel might generate in an intense fire event. The establishment and maintenance of the asset protection zone is required to achieve specific bushfire attack level ratings (BAL) which in turn is used to determine the relevant construction requirements. There are two protection areas within an asset protection zone: the inner protection area and the outer protection area, and the following details should be applied as appropriate to the particular development.

The inner protection area is that area immediately around the building envelope that aims to reduce the combustible fuel levels and thereby reduce the possible impacts of direct flame contact and radiant heat to the building elements. The inner protection area should have a tree canopy of less than 15% with no part of any tree within 2 metres of the roofline of the dwelling. Gardens with shrubs and other woody plant materials should not be located under trees such that they could provide a ladder for fire to reach the tree canopy, and they should also not be planted within 10 metres of any exposed window or door of the defendable structure. All trees should be maintained such that there are no limbs below 2 metres from the ground surface.



Example of the methods used for determining the effective slope under the vegetation formation.

The outer protection area should have a tree canopy of less than 30% and should have the lower strata vegetation mowed and managed to reduce the rate of fire spread. The aim of reducing the density of the tree canopy is to reduce the rate of crown fire spread, and to help filter some of the flying embers by the remaining trees.

The asset protection zones should be calculated with reference to Table A1.12.2 "Minimum Distances for APZ's – Residential Development (m) FFDI 100 Areas (≤29kW/m², 1090K)" and 'Table A1.12.4 "Allowable Outer Protection Area Distances (m) within an APZ for Forest Vegetation", page 90 of "Planning for Bush Fire Protection" (2019).

6. Bushfire Attack Level (BAL)

The Bushfire Attack Level (BAL) is defined as "a means of measuring the severity of a building's potential exposure to ember attack, radiant heat and direct flame contact, using increments of radiant heat expressed in kilowatts per metre squared, and the basis for establishing the requirements for construction to improve protection of building elements from attack by bushfire. There are several 'levels' within the range of BAL assessments, each with differing construction standards - and these are explained at the end of this report for reference purposes.

7. Construction Standards (for Buildings of Classes 1, 2, 3, 4 and Certain Class 9 Buildings that are Deemed Special Fire Protection Purpose (SFPP)).

"AS3959 - 2018 Construction in Bushfire Prone Areas" sets out the construction requirements for building elements in order to reduce the likelihood of ignition of the building during a bushfire event. The level of building construction is defined as Bushfire Attack Level (BAL) and is equivalent to the BAL rating derived from the above-mentioned processes and assessments.

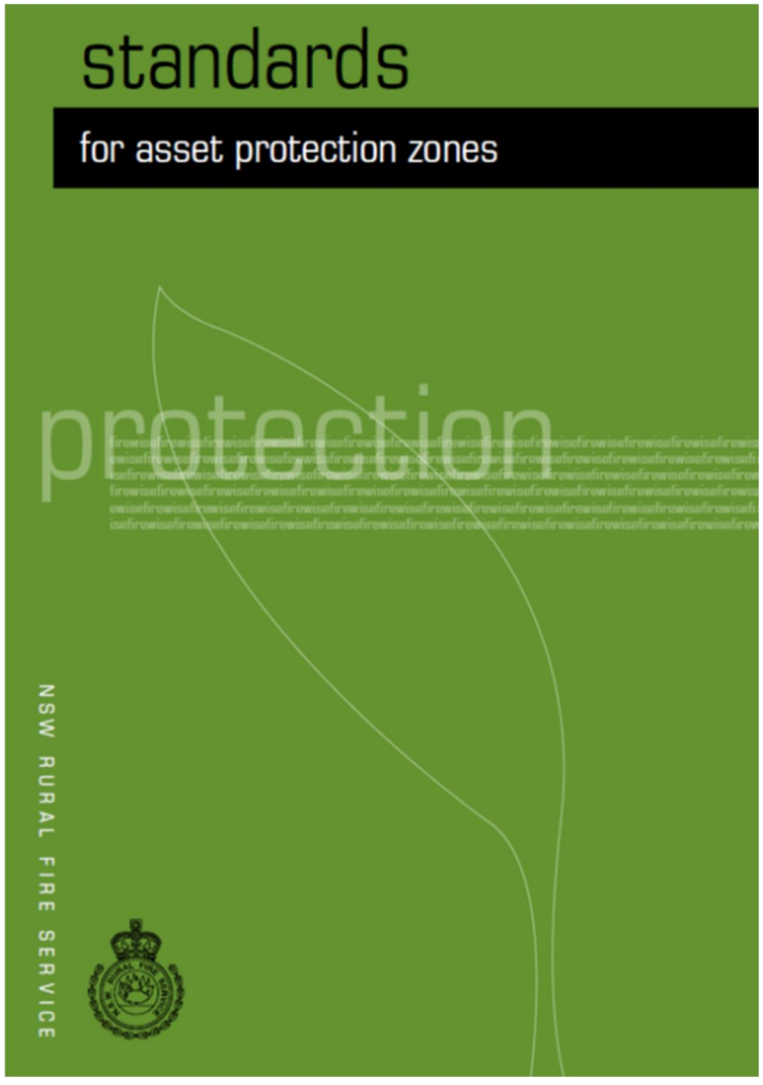
In addition to the construction standards set out in the relevant Sections of "AS3959 - 2018 Construction in Bushfire Prone Areas", the requirements previously discussed in this summary pertaining to access and egress, water supply, gas supply and the asset protection zones must also be undertaken as each of the bush fire protection measures must be considered as a 'whole of system' approach to bush fire protection rather than undertaking individual components in isolation.

**** It is noted that there are several requirements in New South Wales where the construction standards of Section 5 (BAL 12.5) and Section 6 (BAL 19) of "AS3959 - 2018 Construction of Buildings in Bush Fire Prone Areas" have been superseded and replaced with additional construction standards equal to the construction standards as set out in Section 7 (BAL 29) of "AS3959 - 2018 Construction of Buildings in Bush Fire Prone Areas". For further details refer to Chapter 7.5.2 of Planning for Bush Fire Protection (2019) [page 70]. These variations are to be applied to the individual dwelling constructions as applicable based on specific siting and design details at the time of lodging a formal development application to Council.**

8. General Maintenance and Landscaping.

The establishment of gardens and lawns are often a dominant part of the rural lifestyle choice as they help to provide seclusion, shelter and a general beautification of the landscape, however consideration needs to be given to the type and structure of the landscaping components to ensure that they do not form a continuum between the classified vegetation formations and the building elements. Selection of appropriate vegetation types and form for landscaping purposes are important considerations, as is the location and positioning of various plantings. It is important that critical asset protection areas are not compromised by the establishment of landscaping features, and that the longer term maintenance requirements of established gardens do not in fact add to the potential fire fuel loads around the property.

The publication "Standards for Asset Protection Zones" (2006) from the NSW Rural Fire Service provides good advice and guidelines for the establishment of asset protection areas, landscaping and longer term maintenance requirements and should be referenced prior to the design and installation of landscaping features.



E. Conclusion.

It is the formal assessment of this report that the proposed amendment to Part 4 – Principal Development Standards' – subsection '*4.2A - Erection of dwelling houses and dual occupancies on land in certain rural and environment protection zones'* of the Wingecarribee Local Environmental Plan (2010) to support the proposed boundary adjustment between two parcels of land identified as Lot 11 DP1226788 & Lot 841 DP1253894 – Old South Road at Mittagong will satisfy the relevant requirements of 'Planning of Bush Fire Protection (2019)'.

It is further considered that any potential future residential development undertaken within the proposed Lot 844 will be able to comply with the acceptable solutions, performance requirements, and specific objectives provisions of "Planning for Bush Fire Protection" (2019) and "AS3959 - 2018 Construction of Buildings in Bush Fire Prone Areas" if applicable.

Following redistribution and registration of the new boundaries any subsequent residential dwelling development within the proposed Lot 844 may be required to provide an independent bush fire hazard assessment that addresses the requirements of the appropriate standards and legislation at the time of a formal development application to Council if it is deemed to be burdened by mapped bush fire prone lands.

Appendix A – list of threatened and protected animal and plant species, populations, endangered ecological communities, critical habitat and threatening processes

	Kingdom	Class	Family	Species Code	Scientific Name	Common Name	NSW status	Comm. status
1	Community				*Monaro Tableland Cool Temperate Grassy Woodland in the South Eastern Highlands Bioregion*	Monaro Tableland Cool Temperate Grassy Woodland in the South Eastern Highlands Bioregion	E4B	
2	Community				*Montane Peatlands and Swamps of the New England Tableland, NSW North Coast, Sydney Basin, South East Corner, South Eastern Highlands and Australian Alps bioregions*	Montane Peatlands and Swamps of the New England Tableland, NSW North Coast, Sydney Basin, South East Corner, South Eastern Highlands and Australian Alps bioregions	E3	E
3	Community				*Natural Temperate Grassland of the South Eastern Highlands*	Natural Temperate Grassland of the South Eastern Highlands		CE
4	Community				*Tableland Basalt Forest in the Sydney Basin and South Eastern Highlands Bioregions*	Tableland Basalt Forest in the Sydney Basin and South Eastern Highlands Bioregions	E3	
5	Community				*Tablelands Snow Gum, Black Sallee, Candlebark and Ribbon Gum Grassy Woodland in the South Eastern Highlands, Sydney Basin, South East Corner and NSW South Western Slopes Bioregions*	Tablelands Snow Gum, Black Sallee, Candlebark and Ribbon Gum Grassy Woodland in the South Eastern Highlands, Sydney Basin, South East Corner and NSW South Western Slopes Bioregions		
6	Community				*Werriwa Tablelands Cool Temperate Grassy Woodland in the South Eastern Highlands and South East Corner Bioregions*	Werriwa Tablelands Cool Temperate Grassy Woodland in the South Eastern Highlands and South East Corner Bioregions	E4B	
7	Community				*White Box Yellow Box Blakely's Red Gum Woodland*	White Box Yellow Box Blakely's Red Gum Woodland	E3	CE
8	Threat				*Aggressive exclusion of birds from woodland and forest habitat by abundant Noisy Miners Manorina melanocephala*	Aggressive exclusion of birds from woodland and forest habitat by abundant Noisy Miners Manorina melanocephala	KTP	
9	Threat				*Alteration of habitat following subsidence due to longwall mining*	Alteration of habitat following subsidence due to longwall mining	KTP	

10	Threat				*Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands*	Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands	KTP	
11	Threat				*Anthropogenic Climate Change*	Anthropogenic Climate Change	KTP	KTP
12	Threat				*Bushrock removal*	Bushrock removal	KTP	
13	Threat				*Clearing of native vegetation*	Clearing of native vegetation	KTP	KTP
14	Threat				*Competition and grazing by the feral European Rabbit, Oryctolagus cuniculus (L.)*	Competition and grazing by the feral European Rabbit, Oryctolagus cuniculus (L.)	KTP	KTP
15	Threat				*Competition and habitat degradation by Feral Goats, Capra hircus Linnaeus 1758*	Competition and habitat degradation by Feral Goats, Capra hircus Linnaeus 1758	KTP	KTP
16	Threat				*Competition from feral honey bees, Apis mellifera L.*	Competition from feral honey bees, Apis mellifera L.	KTP	
17	Threat				*Forest eucalypt dieback associated with over-abundant psyllids and Bell Miners*	Forest eucalypt dieback associated with over-abundant psyllids and Bell Miners	KTP	
18	Threat				*Herbivory and environmental degradation caused by feral deer*	Herbivory and environmental degradation caused by feral deer	KTP	
19	Threat				*High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition*	High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition	KTP	
20	Threat				*Importation of Red Imported Fire Ants Solenopsis invicta Buren 1972*	Importation of Red Imported Fire Ants Solenopsis invicta Buren 1972	KTP	KTP
21	Threat				*Infection by Psittacine Circoviral (beak and feather) Disease affecting endangered psittacine species and populations*	Infection by Psittacine Circoviral (beak and feather) Disease affecting endangered psittacine species and populations	KTP	KTP
22	Threat				*Infection of frogs by amphibian chytrid causing the disease chytridiomycosis*	Infection of frogs by amphibian chytrid causing the disease chytridiomycosis	KTP	KTP
23	Threat				*Infection of native plants by Phytophthora cinnamomi*	Infection of native plants by Phytophthora cinnamomic	KTP	KTP
24	Threat				*Introduction of the Large Earth Bumblebee Bombus terrestris (L.)*	Introduction of the Large Earth Bumblebee Bombus terrestris (L.)	KTP	

25	Threat				*Invasion and establishment of exotic vines and scramblers*	Invasion and establishment of exotic vines and scramblers	KTP	
26	Threat				*Invasion and establishment of Scotch Broom (Cytisus scoparius)*	Invasion and establishment of Scotch Broom (Cytisus scoparius)	KTP	
27	Threat				*Invasion and establishment of the Cane Toad (Bufo marinus)*	Invasion and establishment of the Cane Toad (Bufo marinus)	KTP	KTP
28	Threat				*Invasion of native plant communities by African Olive Olea europaea subsp. cuspidata (Wall. ex G. Don) Cif.*	Invasion of native plant communities by African Olive Olea europaea subsp. cuspidata (Wall. ex G. Don) Cif.	KTP	
29	Threat				*Invasion of native plant communities by Chrysanthemoides monilifera*	Invasion of native plant communities by Chrysanthemoides monilifera	KTP	
30	Threat				*Invasion of native plant communities by exotic perennial grasses*	Invasion of native plant communities by exotic perennial grasses	KTP	
31	Threat				*Invasion of the Yellow Crazy Ant, Anoplolepis gracilipes (Fr. Smith) into NSW*	Invasion of the Yellow Crazy Ant, Anoplolepis gracilipes (Fr. Smith) into NSW	KTP	
32	Threat				*Invasion, establishment and spread of Lantana (Lantana camara L. sens. Lat)*	Invasion, establishment and spread of Lantana (Lantana camara L. sens. Lat)	KTP	
33	Threat				*Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants*	Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants	KTP	KTP
34	Threat				*Loss of Hollow-bearing Trees*	Loss of Hollow-bearing Trees	KTP	
35	Threat				*Loss or degradation (or both) of sites used for hill-topping by butterflies*	Loss or degradation (or both) of sites used for hill-topping by butterflies	KTP	
36	Threat				*Predation and hybridisation by Feral Dogs, Canis lupus familiaris*	Predation and hybridisation by Feral Dogs, Canis lupus familiaris	KTP	
37	Threat				*Predation by Gambusia holbrooki Girard, 1859 (Plague Minnow or Mosquito Fish)*	Predation by Gambusia holbrooki Girard, 1859 (Plague Minnow or Mosquito Fish)	KTP	
38	Threat				*Predation by the European Red Fox Vulpes Vulpes (Linnaeus, 1758)*	Predation by the European Red Fox Vulpes Vulpes (Linnaeus, 1758)	KTP	KTP

39	Threat				*Predation by the Feral Cat Felis catus (Linnaeus, 1758)*	Predation by the Feral Cat Felis catus (Linnaeus, 1758)	KTP	KTP
40	Threat				*Predation, habitat degradation, competition and disease transmission by Feral Pigs, Sus scrofa Linnaeus 1758*	Predation, habitat degradation, competition and disease transmission by Feral Pigs, Sus scrofa Linnaeus 1758	KTP	KTP
41	Threat				*Removal of dead wood and dead trees*	Removal of dead wood and dead trees	KTP	

Appendix B

AHIMS Web Services (AWS)
Search Result

Your Ref/PO Number : 0150821
Client Service ID : 697190

Paul Johnson
PO Box 619
Goulburn New South Wales 2580
Attention: Paul Johnson
Email: sowdes@sowdes.com

Date: 01 July 2022

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lot : 1, DP:DP608071, Section : - with a Buffer of 50 meters, conducted by Paul Johnson on 01 July 2022.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.

A search of Heritage NSW AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

0	Aboriginal sites are recorded in or near the above location.
0	Aboriginal places have been declared in or near the above location. *

Appendix C

BUSH FIRE ATTACK LEVELS (BAL's) EXPLAINED

The 2018 edition of AS 3959 "Construction of Buildings in Bush Fire Prone Areas" explains Bush Fire Attack Levels (BAL's) as follows:

(a) **BAL—LOW** The risk is considered to be **VERY LOW**.
There is insufficient risk to warrant any specific construction requirements but there is still some risk.

(b) **BAL—12.5** The risk is considered to be **LOW**.
There is a risk of ember attack. The construction elements are expected to be exposed to a heat flux not greater than 12.5 kW/m2.

(c) **BAL—19** The risk is considered to be **MODERATE**.
There is a risk of ember attack and burning debris ignited by wind borne embers and a likelihood of exposure to radiant heat. The construction elements are expected to be exposed to a heat flux not greater than 19 kW/m2.

(d) **BAL—29** The risk is considered to be **HIGH**.
There is an increased risk of ember attack and burning debris ignited by windborne embers and a likelihood of exposure to an increased level of radiant heat. The construction elements are expected to be exposed to a heat flux not greater than 29 kW/m2.

(e) **BAL—40** The risk is considered to be **VERY HIGH**.
There is a much increased risk of ember attack and burning debris ignited by windborne embers, a likelihood of exposure to a high level of radiant heat and some likelihood of direct exposure to flames from the fire front. The construction elements are expected to be exposed to a heat flux not greater than 40 kW/m2.

(f) **BAL—FZ** The risk is considered to be **EXTREME**.
There is an extremely high risk of ember attack and burning debris ignited by windborne embers, and a likelihood of exposure to an extreme level of radiant heat and direct exposure to flames from the fire front. The construction elements are expected to be exposed to a heat flux greater than 40kW/m^2.