

Bushfire Assessment Report

Proposed:
Residential Subdivision

At:
**South Gillieston Heights
(Eastern Precinct)
457-527 Cessnock Road,
Gillieston Heights NSW**

Reference Number: 230963

22 June 2023



Prepared By:
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Version Control				
Version	Date	Author	Reviewed by	Details
1	09/06/2023	Stuart McMonnies	Andrew Muirhead	Draft Report
2	22/06/2023	Stuart McMonnies		Final Report

List of Abbreviations:

APZ	Asset Protection Zone
AS3959	Australian Standard 3959: 2018 'Construction of buildings in bushfire-prone areas' as amended
BAL	Bushfire Attack Level
BPMs	Bushfire Protection Measures
BPLM	Bushfire Prone Land Map
Council	Maitland City Council
DA	Development Application
DCP	Maitland Development Control Plan 2011
ELVIS	Elevation and Depth Foundation Spatial Data
EP&A Act	<i>Environmental Planning and Assessment Act - 1979</i>
FRNSW	Fire and Rescue NSW
IPA	Inner Protection Area
NASH	National Association of Steel-framed Housing
NCC	National Construction Code
NP	National Park
NSP	Neighbourhood Safer Place
OPA	Outer Protection Area
PBP	<i>Planning for Bush Fire Protection – 2019 as amended</i>
ROW	Right of Way
RF Act	<i>Rural Fires Act - 1997</i>
RFS	NSW Rural Fire Service
SEPP	State Environmental Planning Policy
SFPP	Special Fire Protection Purpose
SWS	Static Water Supply

1.0 Introduction

Building Code and Bushfire Hazard Solutions P/L has been commissioned by Walker Gillieston Heights Pty Ltd to prepare an independent Bushfire Assessment Report to accompany a Development Application seeking approval for the staged subdivision of Gillieston Heights (Eastern Precinct).

The proposal will result in the creation of three hundred and twenty-two (322) new residential allotments, drainage reserves, open space reserves, residue lot and construction of associated infrastructure.

The subject site forms part of the Gillieston Heights Urban Release Area (URA) under the Maitland Development Control Plan 2011 (DCP). The site is located within Stage 3 of the eastern precinct. The DCP does not specify any development controls for bushfire.

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.

Maitland City Council Bushfire Prone Land Map (BPLM) has identified the site as containing Category 3 Vegetation and Vegetation Buffer and therefore the site is considered 'bushfire prone'.

The subject development relates to the subdivision of bushfire prone land which can be lawfully used for residential purposes and is therefore classified as integrated development under section 4.46 of the *Environmental Planning and Assessment Act 1979*. The development is captured under section 100B of the *Rural Fires Act 1997* and must obtain a Bush Fire Safety Authority from the Commissioner of the NSW Rural Fire Service.

In accordance with the submission requirements for a Bush Fire Safety Authority as detailed in clause 45 of the *Rural Fires Regulation 2022* an assessment of the extent to which the proposed development conforms with or deviates from *Planning for Bush Fire Protection (PBP)* is required.

This report has assessed the subject site and proposal against the aim and objectives detailed in Chapter 1 'Introduction' and specific objectives, bushfire protection measures detailed in Chapter 5 'Residential and Rural Residential Subdivisions' of PBP.

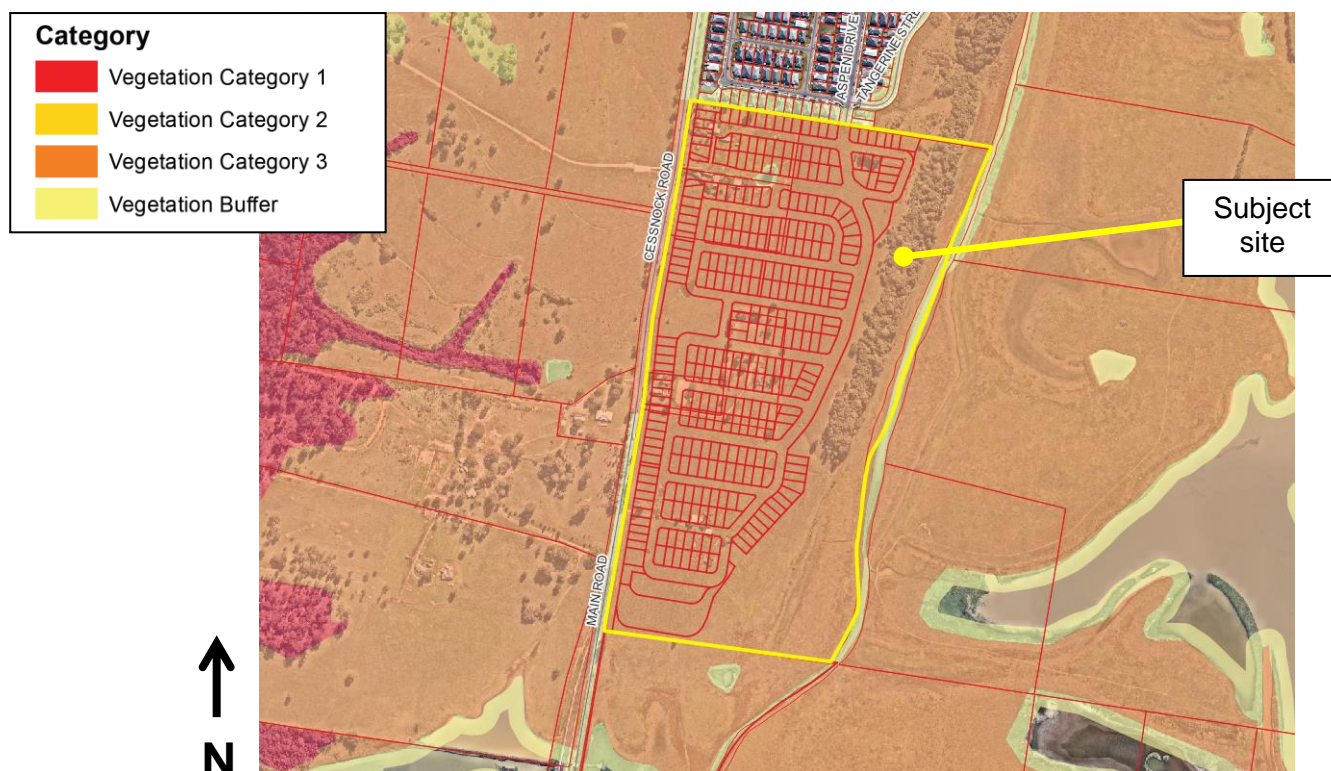


Figure 01: Extract from Maitland City Council's Bushfire Prone Land Map

2.0 Legislative Requirements

The site is subject to the following legislative provisions as it relates to bushfire planning and protection:

- *Environmental Planning & Assessment Act 1979*
- *Rural Fires Act 1997*
- *Rural Fires Regulation 2022*
- *Planning for Bush Fire Protection*

2.1 Rural Fires Act 1997

The subdivision of bushfire prone land which can be lawfully used for residential purposes is captured by section 100b of the *Rural Fires Act 1997*.

The development must obtain a Bush Fire Safety Authority from the Commissioner of the NSW Rural Fire Service (RFS).

2.2 Environmental Planning & Assessment Act 1979

Section 10.3 requires councils, where a Bush Fire Risk Management Plan applies, to record a bush fire prone land map after consulting with the Commissioner of the NSW Rural Fire Service (NSW RFS). The Commissioner will designate lands to be bush fire prone within an area and, when satisfied that the lands have been recorded on a map, certify the map as the Bush Fire Prone Land map.

As the proposal is subject to s.100B of the *Rural Fires Act 1997*, it is integrated development in accordance with s.4.46. This means that the proposed development requires authorization in respect of bush fire safety because of the subdivision of the land that is proposed to be lawfully used for residential purposes.

2.3 Rural Fires Regulation 2022

Section 45 sets out the relevant matters that must be considered when assessing a bushfire safety authority and includes an assessment of the proposal against Planning for Bush Fire Protection.

2.4 Planning for Bush Fire Protection

As the subject site is identified as being bushfire prone and the proposed development involves a residential subdivision the proposal is subject to the application of the relevant specifications and requirements of Planning for Bush Fire Protection.

The proposal is required to demonstrate that it achieves compliance with the following elements of PBP:

- Chapter 1 - Aim and Objectives
- Chapter 5 – Residential and Rural Residential Subdivisions

3.0 Purpose of Report

The purpose of this Bushfire Assessment Report is to provide Walker Gillieston Heights Pty Ltd, the NSW Rural Fire Service and Maitland City Council with an independent bushfire assessment together with appropriate recommended bushfire mitigation measures.

The recommendations contained within this report may assist in forming the basis of any specific construction conditions and/or bushfire mitigation measures that Council and/or the NSW Rural Fire Service may elect to place within any consent conditions issued for the subject Development Application.

4.0 Scope of this Report

The scope of this report is limited to providing a bushfire assessment and recommendations for the subject property. 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 property.

5.0 Compliance Table & Notes

The following table sets out the projects compliance with *Planning for Bush Fire Protection – 2019*.

	Northeast	East	East	West
Vegetation Structure	Grassland	Rainforest	Forest	Grassland
Slope	10 - 15 degrees down	15 - 20 degrees down*	10 - 15 degrees down	0 – 5 degrees down
Required Asset Protection Zone	15 metres	40 metres*	45 metres	12 metres
Available Asset Protection Zone	>23 metres	≥40 metres	≥45 metres	>30 metres
Significant Landscape Features	External APZ (20m)	Wallis Creek	Wallis Creek	Electrical easement / Cessnock Road
Bushfire Attack Level	BAL 19	BAL 29	BAL 29	BAL 12.5

* As a validation process in acknowledging areas exceeding 20 degrees Short Fire Run modelling was undertaken which concluded a minimum APZ of 40 metres which was adopted. Refer to section 6.03 for further details.

Compliance Summary of Bushfire Protection Measures			
Bushfire Protection Measure (s5 PBP)	Acceptable Solution	Performance Solution	Report Section
Asset Protection Zones	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	8.03
Landscape	<input checked="" type="checkbox"/>	<input type="checkbox"/>	8.03
Access	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	8.03
Services	<input checked="" type="checkbox"/>	<input type="checkbox"/>	8.03

Asset Protection Zones

The minimum required Asset Protection Zones (APZs) were determined from Table A1.12.2 of PBP to be 15 metres to the northeast, 45 metres to the east (Forest) and 12 metres to the west.

In acknowledging areas exceeding 20 degrees within the Rainforest to the east Short Fire Run modelling was adopted as a verification process. This modelling concluded an increase of the minimum APZ from 30 metres (Table A1.12.2) to 40 metres.

The available APZs consist of maintained land entirely within the subject site, proposed external APZ to the northeast and Cessnock Road / Main Road.

Construction Level

No new dwellings are proposed as part of this application.

An independent assessment will be required under s4.14 of the *Environmental Planning and Assessment Act 1997* at the time of any future application for the construction of a new dwelling within the proposed new allotments.

6.0 Aerial view & Subdivision Plan

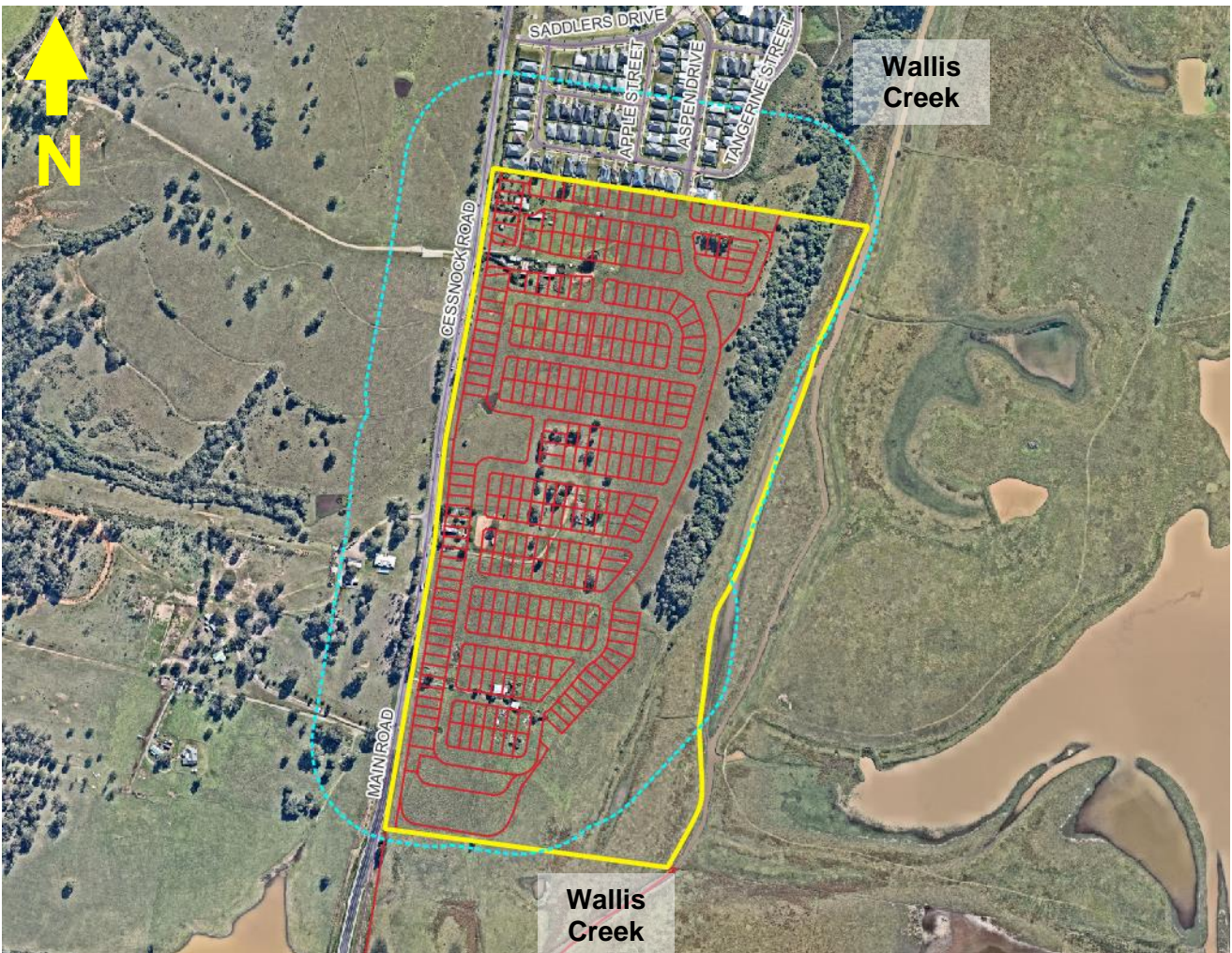


Figure 02: Aerial view of the subject area C/- Nearmap (May 2023)
 Subject site (thick yellow outline), proposed residential and drainage allotments and road reserves (red outline) and 140m assessment area (blue dotted line)

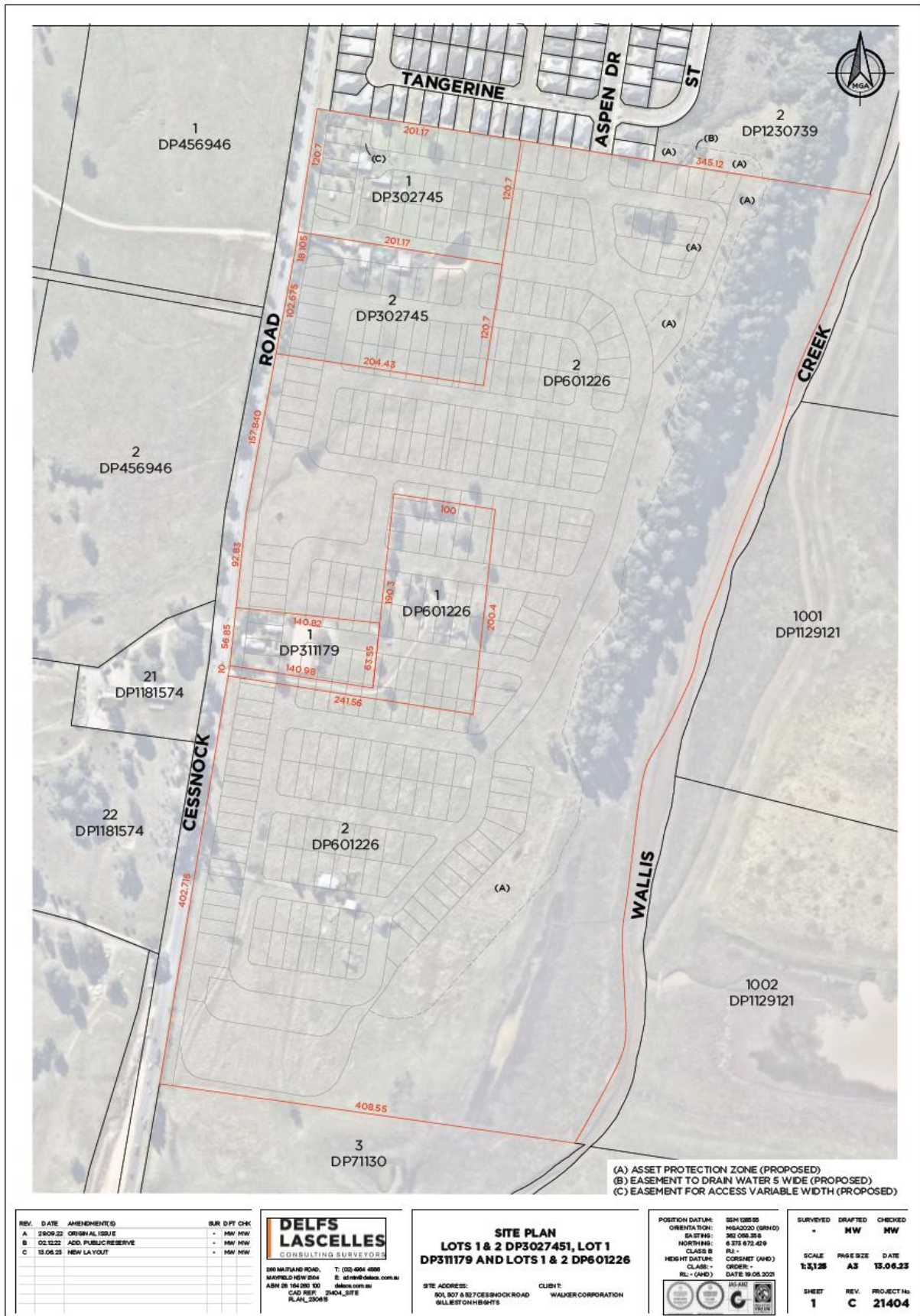


Figure 03: Proposed Site Plan

7.0 Site Assessment

A representative of Building Code & Bushfire Hazard Solutions completed a site inspection of the subject site and surrounding area on 21 April 2023.

In addition, the following external data sources have been relied upon for the site assessment:

- Aerial imagery of the subject area (NSW Spatial Services & Nearmap)
- 1 metre contour mapping of the subject area (Elevation and Depth Foundation Spatial Data – Geoscience Australia)
- NSW Planning Portal Spatial Viewer
- Vegetation mapping (NSW State Vegetation Map)
- Vegetation mapping (AEP, 2023)
- NSW Bush Fire Prone Land (NSW Rural Fire Service)

7.01 Location

The subject property comprises of five (5) existing allotments and is known as 457 – 527 Cessnock Road, Gillieston Heights NSW. The site comprises of the following allotments:

Lot 2 DP 601226	Lot 1 DP 302745
Lot 1 DP 601226	Lot 2 DP 302745
Lot 1 DP 31179	

The site has an approximate total land area of 43.57 hectares and has a 1km frontage to Main Road / Cessnock Road.

The site has multiple zones being zoned R1: General Residential, RU2: Rural Landscape, C3: Environmental Management and C2: Environmental Conservation under *Maitland Local Environmental Plan 2011* (MLEP 2011).

The subject site forms part of the Gillieston Heights URA under the Maitland DCP. The site is located within Stage 3 of the eastern precinct.

The site abuts existing residential allotments (zoned R1: General Residential) to the north and larger rural allotments to the east and south. The proposal will effectively extend the established residential development to the north, being Stages 1 and 2 of east precinct, south, consistent with the DCP.

The site is within the Greater Hunter Fire Weather District and is captured by the Hunter Bush Fire Risk Management Plan 2009.

7.02 Vegetation

The vegetation structure, connectivity and attributes are fundamental contributors to bushfire behaviour and its movement through the landscape.

As part of this assessment we have considered the potential bushfire runs that currently exist into the site, as well as the potential fire behaviour and impacts following the delivery of the proposed subdivision, including proposed environmental conservation area.

Historically the primary use of the site and neighbouring properties to the east, south and west has been for agriculture purposes, including the cultivation of arable crops and breeding and raising of livestock. These farming practices and other anthropological disturbances have resulted in degraded or fragmented vegetation.

To assess the potential fire runs into the site we have considered all bushfire hazards within 1 kilometre as identified on the Bush Fire Prone Lands Map (Figure 05).

The vegetation in the broader landscape was found to be fragmented, with no significant fire catchments through forest, woodland or heath vegetation into the subject site.

Prevailing weather conditions associated with the bush fire season in the Hunter BFMC area are north-westerly winds accompanied by high daytime temperatures and low humidity (Hunter BFRMP 2009).

Currently there are no catchments through forest, woodland or heath vegetation to the northwest of the subject site, with the majority of this land comprising of open pastures.

In addition, it is noted that there is a recently approved Development Application which grants consent for a Torrens Title Subdivision to create three hundred and fifty four (354) residential allotments and associated infrastructure (DA/2022/193 – 464 Cessnock Road).

Anderson Environment & Planning (AEP) have undertaken extensive field surveys of the subject site to ascertain the extent of significant vegetation and habitat. These surveys have been considered as part of this assessment.

In accordance with Appendix 1 'Site Assessment Methodology' of PBP we have undertaken an assessment of all vegetation formations within 140 metres of the proposed building envelopes for each aspect as per Keith (2004).

The existing vegetation within the subject site is mapped (AEP 2023) as being Sandpaper Fig – Whalebone Tree warm temperate rainforest (1525) and Spotted Gum – Red Ironbark – Narrow-leaved Ironbark – Grey Box shrub-grass open forest of the lower Hunter (1600).

The mapped vegetation will be largely retained and preserved.

The balance of the subject site will either be developed, form part of the formal Asset Protection Zones or be the subject of continued grazing / periodic slashing.

The proposal includes the establishment of a 20 metre wide external Asset Protection Zone within the neighbouring property at 65 Redwood Drive, Gillieston Heights to the northwest. Refer to section 8.03 and attached letter of intent for further information.

The following vegetation parameters for the site were adopted for this assessment:

Plant Community Type	Formation	Class	Surface and Elevation Fuel Load*	Overall Fuel Load (including bark and canopy)*
Sandpaper Fig – Whalebone Tree warm temperate rainforest – 1525	Rainforests	Dry Rainforests	10 t/ha	13.2 t/ha
Spotted Gum – Red Ironbark – Narrow-leaved Ironbark – Grey Box shrub-grass open forest of the lower Hunter – 1600	Dry Sclerophyll Forests (Shrub/ grass sub-formation)	Hunter-Macleay Dry Sclerophyll Forests	14 t/ha	24.6 t/ha

* Fuel loads from NSW Rural Fire Service publication Comprehensive Vegetation Fuel Loads (2019)

The vegetation posing a hazard to the proposed residential allotments was found to be located to the northeast within a neighbouring property, east within the subject site and west beyond Main Road / Cessnock Road within neighbouring private rural allotments.

The vegetation posing a hazard to the northeast, beyond the proposed external APZ, was found to comprise of grassland, transition to rainforest >84 metres away. The Grassland hazard was therefore deemed the highest hazard to this aspect.

The vegetation posing a hazard predominately comprises of Rainforest (PCT 1525), with a small pocket of Forest (PCT 1600). For the purpose of establishing the minimum required Asset Protection Zones the corresponding APZ was applied for each vegetation formation.

The vegetation posing a hazard to the west beyond Main Road / Cessnock Road was found to comprise of Grassland. Consideration has been given to the recently approved DA (DA/2022/193 – 464 Cessnock Road) with no additional hazards identified within the assessment area.

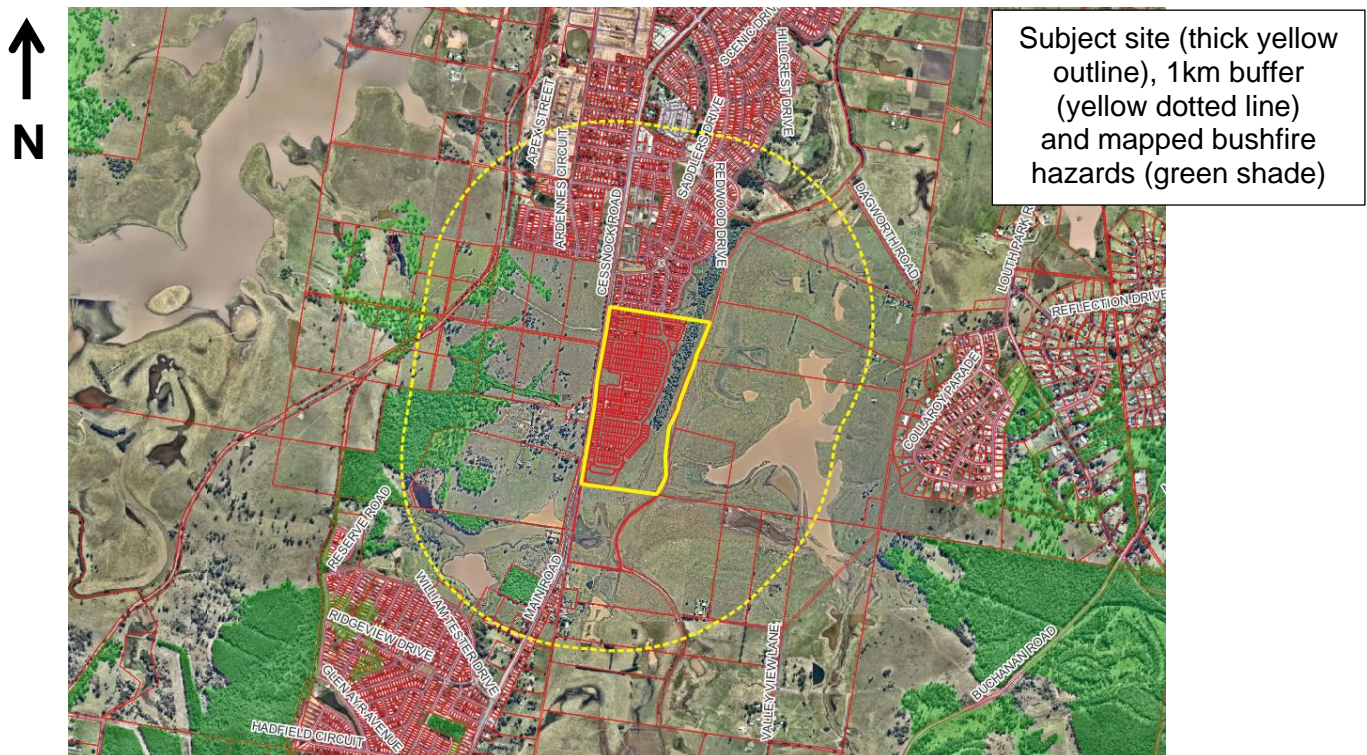


Figure 05: Aerial view of the locality overlaid with mapped bushfire hazards (source BPLM)



Rainforest hazard

Photograph 01: View of Rainforest hazard

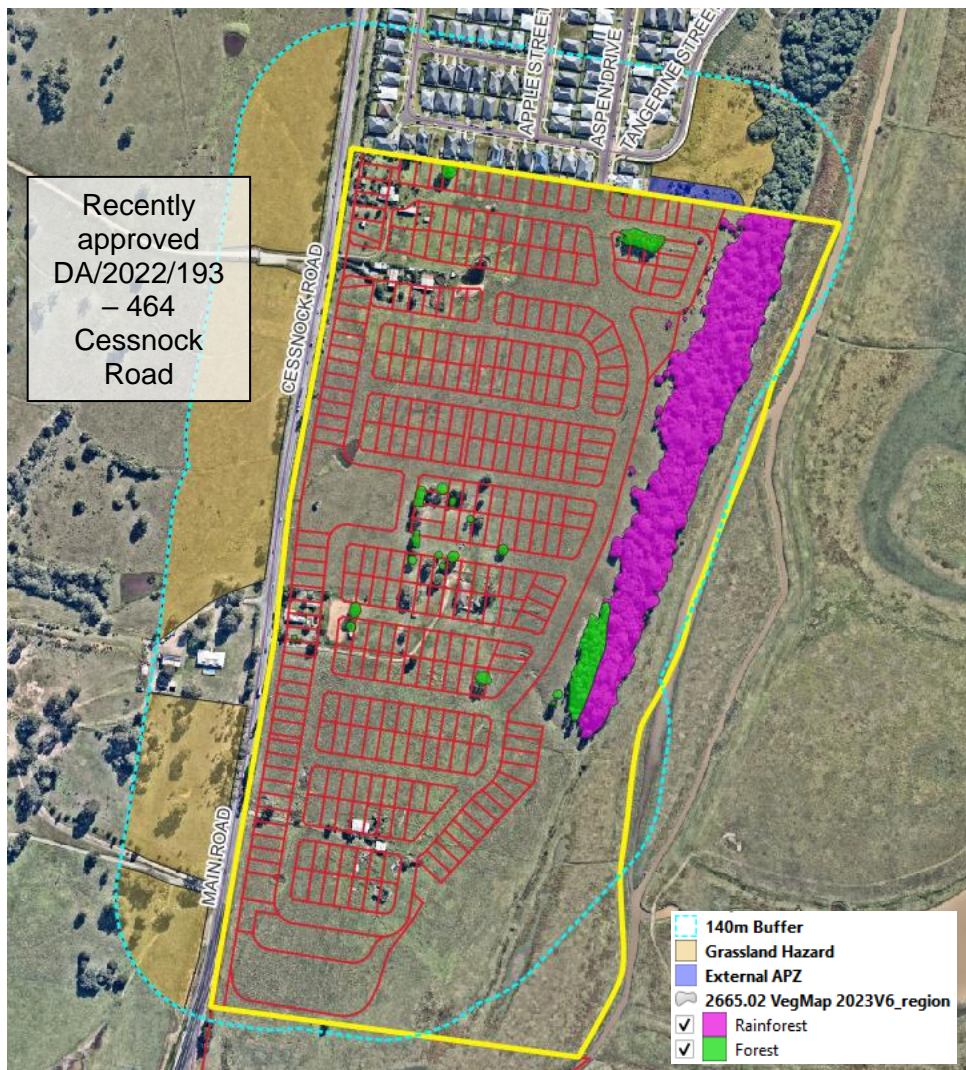


Figure 06: Aerial image of the subject site overlaid with vegetation assessment

7.03 Slope and Topography

The slope of the land under the classified vegetation has a direct influence on the forward rate of spread, fire intensity and radiant heat exposure. The effective slope is considered to be the slope under the classified vegetation which will most significantly influence bushfire behaviour toward the development site.

In accordance with A1.4 'Determine slope' of PBP the slope assessment is to be derived from the most detailed contour data available.

The slope that would **most significantly** influence bushfire behaviour was determined from topographic imagery (1 metre contours sourced from ELVIS – Geoscience Australia) in conjunction with site observations.

There are areas within the identified rainforest hazard that were observed to have slopes exceeding 20 degrees. While physical access was restricted these areas appeared to include small cliffs / escarpments.

The APZ tables within PBP are provided for acceptable solutions with slopes of up to 20 degrees. In accordance with A1.4 of PBP effective slopes in excess of 20 degrees require a detailed performance assessment.

While aspect is rarely discussed or considered in the bushfire planning framework it must be acknowledged that this hazard is on an easterly aspect which is not associated with the traditional fire path of extreme bushfires in this area. In addition, this vegetation has no recorded wildfire history.

In consideration of the site characteristics it is of our opinion that the use of Table A1.12.2 of PBP and an effective slope of >15-20 degrees will provide suitable protection to mitigate bushfire impact from the Rainforest area.

Regardless in acknowledging the steeper slopes as a validation process Short Fire Run modelling consistent with A1.11.2 of PBP was undertaken and the larger Asset Protection Zone adopted.

The recorded effective slopes are outlined in the compliance table in section 5 of this report.

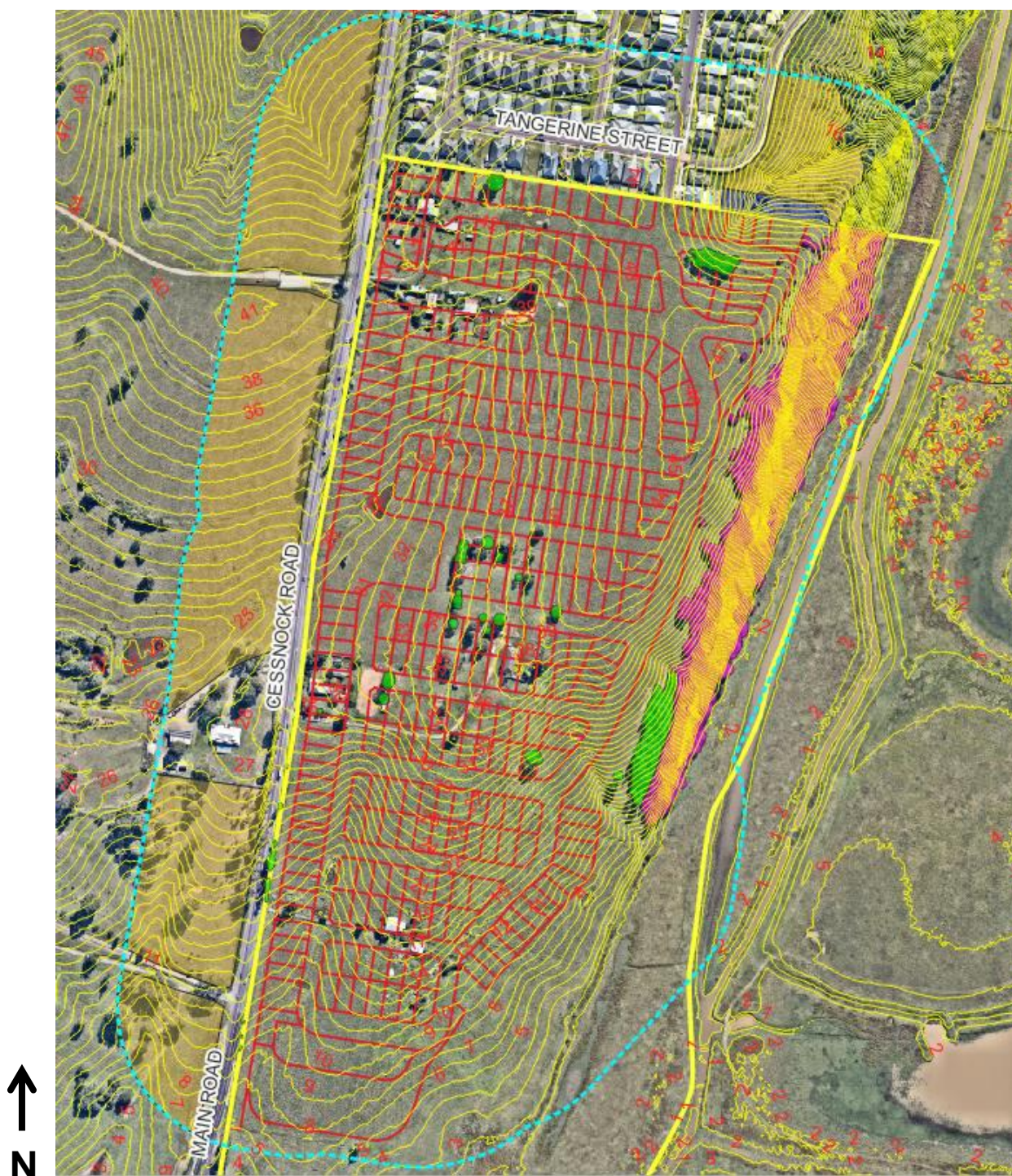


Figure 07: Extract from ELVIS – Geoscience Australia (1m contours)
Subject site (Thick yellow outline), proposed lot boundaries (red outline) and 140m assessment buffer (blue dotted line)

7.04 Fire Weather

All development which attracts an Asset Protection Zone under PBP requires the identification of the relevant Fire Danger Index (FDI). The FDI required to be used for development assessment purposes is based on the local government boundaries, being Maitland City Council in this instance.

In accordance with the NSW Rural Fire Service publication 'NSW Local Government Areas FDI' (2017) Maitland City Council forms part of the Greater Hunter Region Fire Weather District and attracts an FFDI of 100.

As there are identified grassland hazards, Table 5.1.4a of PBP was used to determine a Grassland Fire Danger Index (GFDI) of 130.

7.05 Fire History

Some specific locations have significant fire history and are recognised as known fire paths. While the fire history is more commonly considered as part of strategic planning (to ensure future development is not exposed to an unacceptable risk), it is useful to consider at a Development Application phase to ensure the land is suitable for development in the context of bushfire risk.

In this instance there have been no recorded wildfires within the subject site or immediate surrounding area or broader landscape (source NPWS Fire History dataset). The closest recorded wildfire is >2 kms to the southwest of the closest proposed residential allotment. This fire occurred during the 2002-03 fire season.

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

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.

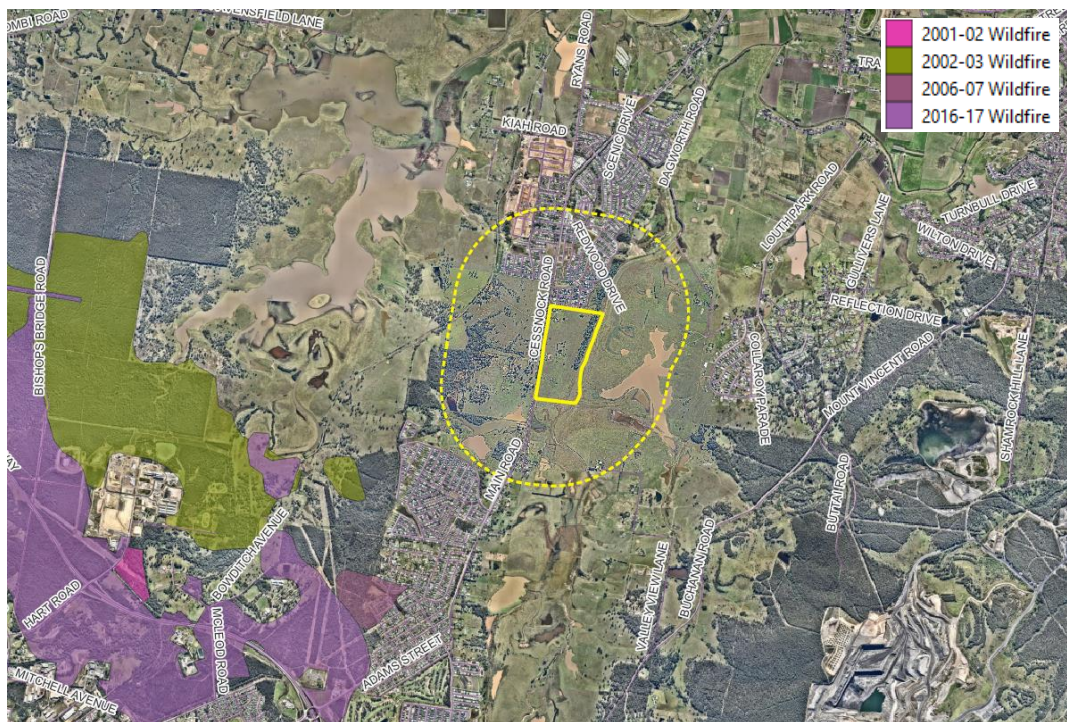


Figure 08: Aerial image overlaid with NPWS fire history

8.0 Bushfire Assessment

8.01 Planning for Bush Fire Protection - 2019

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.

Maitland City Council Bushfire Prone Land Map (BPLM) has identified the site as containing Category 3 Vegetation and Vegetation Buffer the site is considered 'bushfire prone'.

The subject development relates to the subdivision of bushfire prone land which can be lawfully used for residential purposes and is therefore classified as integrated development under section 4.46 of the *Environmental Planning and Assessment Act* 1979. The development is captured under section 100B of the *Rural Fires Act* 1997 and must obtain a Bush Fire Safety Authority from the Commissioner of the NSW Rural Fire Service.

In accordance with the submission requirements for a Bush Fire Safety Authority as detailed in clause 45 of the *Rural Fires Regulation* 2022 an assessment of the extent to which the proposed development conforms with or deviates from *Planning for Bush Fire Protection* (PBP) is required.

The application of PBP requires satisfactory demonstration of the aim and objectives and the specific objectives and bushfire protection measures relevant to the type of development.

In this instance the proposal relates to a residential subdivision and therefore in addition to the aim and objectives detailed in Chapter 1 'Introduction' the proposal must satisfy the specific objectives, bushfire protection measures detailed in Chapter 5 'Residential and Rural Residential Subdivisions' of PBP.

8.02 Specific Objectives

The following table lists the specific objectives for residential and rural residential subdivisions with a dwelling entitlement in accordance with section 5.2 of PBP and our comments of the proposal compliance or otherwise.

Specific Objective	Comment
<i>minimise perimeters of the subdivision exposed to the bush fire hazard (hourglass shapes, which maximise perimeters and create bottlenecks should be avoided);</i>	<p>The proposal provides a perimeter road adjacent the identified Rainforest and Forest hazards.</p> <p>The proposed subdivision design does not result in an hourglass shape.</p>
<i>minimise vegetated corridors that permit the passage of bush fire towards buildings;</i>	<p>The subject development retains a narrow corridor of Rainforest / Forest. This vegetation is located on an easterly aspect, with no recorded wildfires.</p> <p>A perimeter road and suitable APZs have been provided.</p>

Specific Objective	Comment
<p><i>provide for the siting of future dwellings away from ridge-tops and steep slopes, within saddles and narrow ridge crests;</i></p>	<p>The future building envelopes will not be located on a ridge-top or on steep slopes.</p>
<p><i>ensure that APZs between a bush fire hazard and future dwellings are effectively designed to address the relevant bush fire attack mechanisms;</i></p>	<p>In this instance all proposed allotments can accommodate a building footprint exceeding the minimum required APZs.</p> <p>The separation from the identified hazards includes managed land within the subject site, a proposed external APZ and Main Road / Cessnock Road.</p>
<p><i>ensure the ongoing maintenance of APZs;</i></p>	<p>It is expected that the property management within the proposed allotments will be enforced by way of a condition of consent, similar to recommendation 2 of this report, as part of this development process.</p> <p>This will ensure ongoing management of the APZs within the site.</p>
<p><i>provide adequate access from all properties to the wider road network for residents and emergency services;</i></p>	<p>The proposed subdivision will provide a connection from Aspen Drive to the north and Cessnock Road to the west.</p> <p>All proposed allotments will be serviced by the new internal roads which will comply with section 5.3.2 of PBP.</p> <p>In consideration of the risk posed to the subject development the proposed access arrangements in conjunction with the existing are considered adequate.</p>
<p><i>provide access to hazard vegetation to facilitate bush fire mitigation works and fire suppression;</i></p>	<p>Attending fire services have comprehensive access to the identified hazards via the subject property, neighbouring allotments and proposed roads for hazard reduction and / or fire suppression activities.</p> <p>The proposal provides a perimeter road adjacent the identified Rainforest and Forest hazards.</p>
<p><i>ensure the provision of an adequate supply of water and other services to facilitate effective firefighting.</i></p>	<p>Existing in-ground hydrants are available along Cessnock Road, Main Road, Aspen Road and surrounding public roads for the replenishment of attending fire services.</p> <p>Hydrants will be extended along the proposed new roads in accordance with AS2419.1.</p> <p>These hydrants are considered to be the logical water supply for fire services undertaking fire suppression activities.</p>

8.03 Bushfire Protection Measures

Section 5.3 'Bush fire protection measures' of PBP outlines the specific Bushfire Protection Measures (BPMs) applicable to residential and rural residential subdivisions, including APZs, Access and Services.

The following section addresses each BPM and the proposals compliance or otherwise.

Asset Protection Zones & Landscaping

An Asset Protection Zone (APZ) is an area between the development (in this instance the future building envelopes) and the identified hazards where the fuels are maintained to a minimum to prevent the spread of fire between a hazard and an asset.

The width of the APZs is determined by the vegetation structure of the identified hazard, FFDI / GFDI, effective slope and the type of development (residential development or Special Fire Protection Purpose).

APZs for new residential subdivisions are determined from Table A1.12.2 of PBP or bushfire design modelling achieving a radiant heat impact of no more than 29kW/m² at the closest point of the indicative building envelope.

The minimum required Asset Protection Zones (APZs) were determined from Table A1.12.2 of PBP to be 15 metres to the northeast, 45 metres to the east (Forest) and 12 metres to the west.

In acknowledging areas exceeding 20 degrees within the Rainforest to the east Short Fire Run modelling was adopted as a verification process. This modelling concluded an increase of the minimum APZ from 30 metres (Table A1.12.2) to 40 metres.

The available APZs consist of maintained land entirely within the subject site, proposed external APZ to the northeast and Cessnock Road / Main Road.

Temporary APZs will be provided over the land within future stages to alleviate unnecessary construction provisions on future dwellings.

The Asset Protection Zones as identified in Figure 10 will be maintained in accordance with an Inner Protection Area as detailed in the NSW Rural Fire Service's document 'Standards for Asset Protection Zones' and Appendix 4 of *Planning for Bush Fire Protection* 2019.

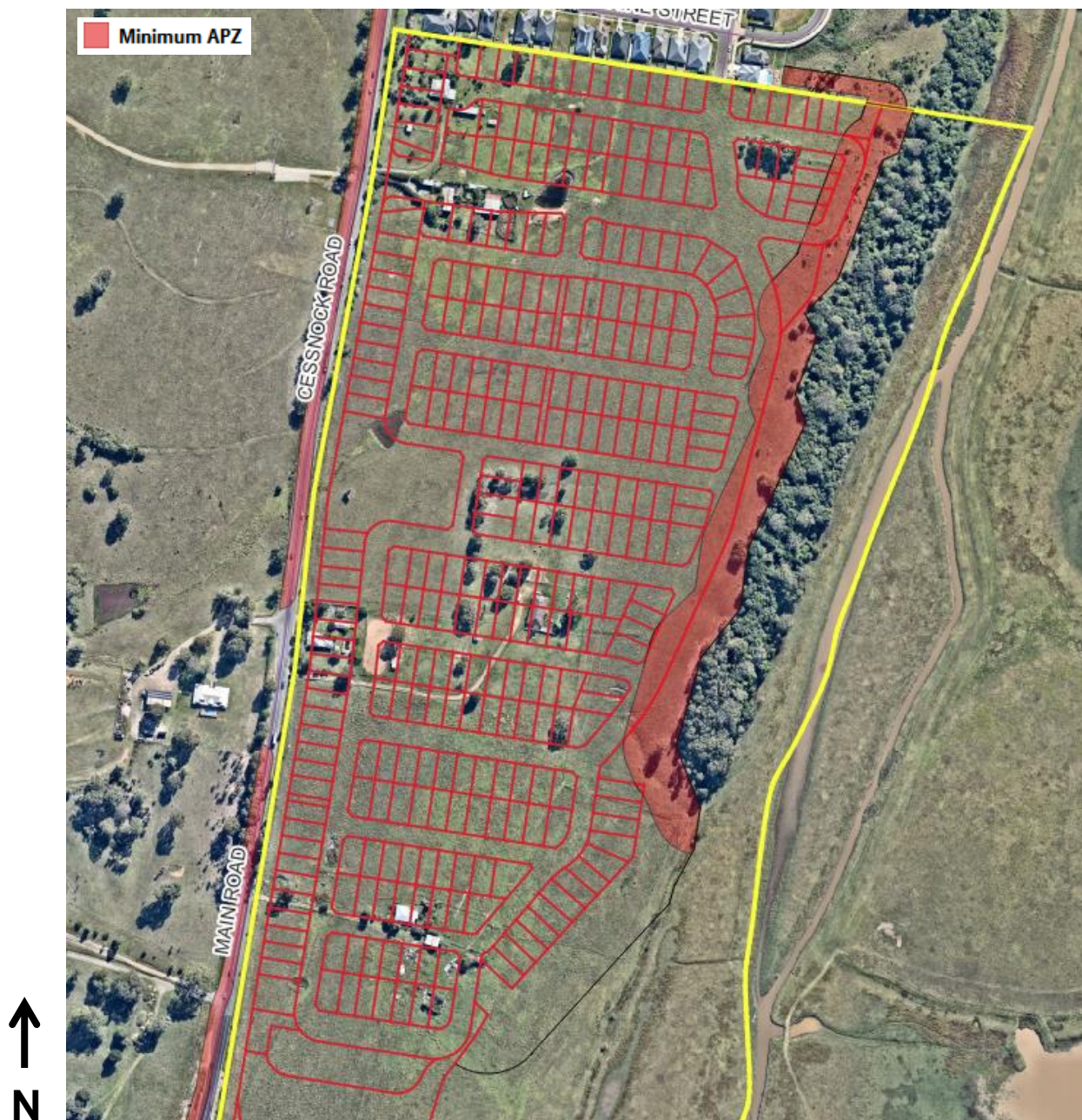


Figure 09: Proposed subdivision plan overlaid with minimum required APZs

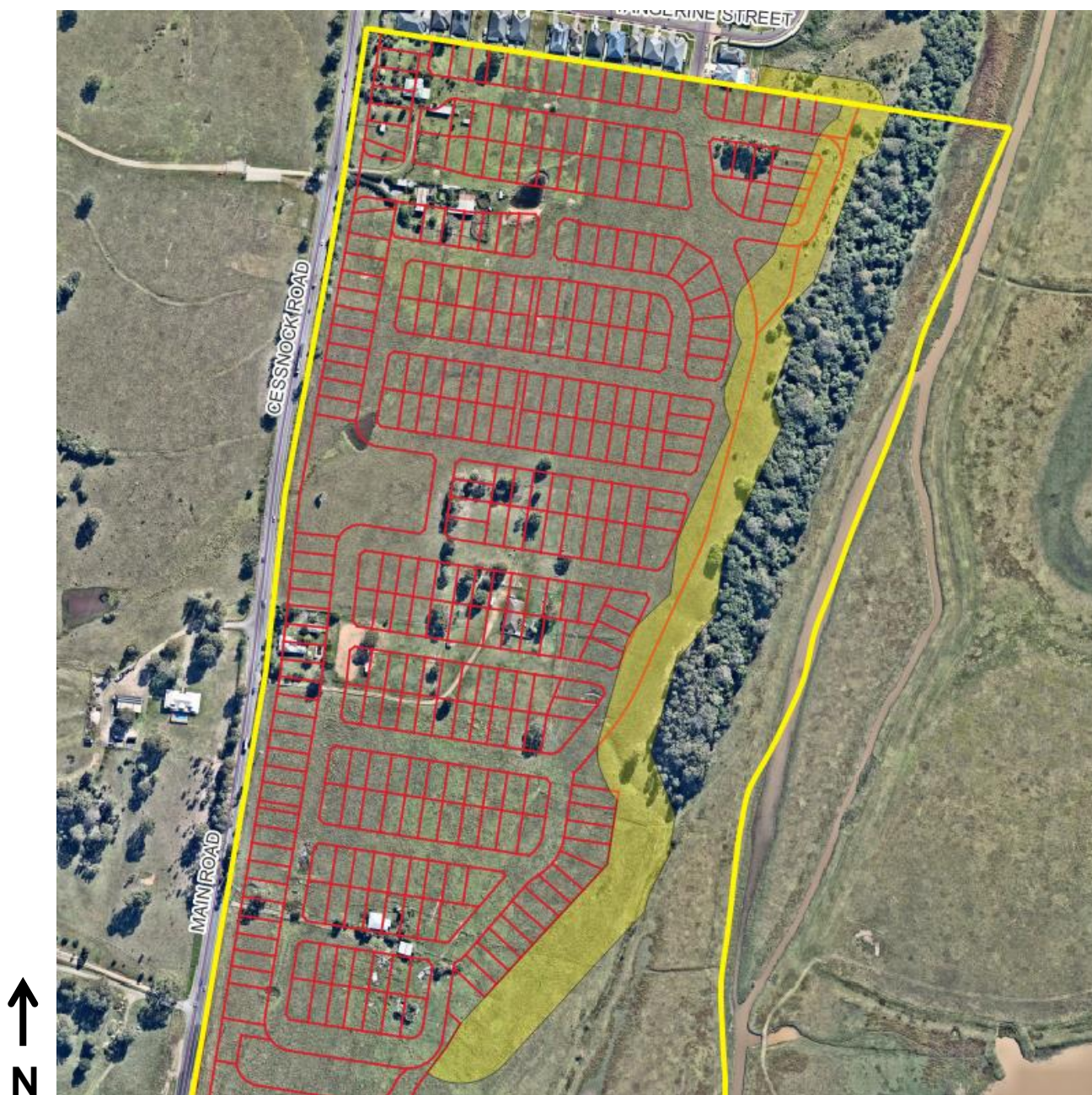


Figure 10: Proposed subdivision plan overlaid with enforced APZs

Access

The subject site has street frontage to Main Road / Cessnock Road to the west.

The proposed allotments will be serviced by the proposed internal roads which will link to the established Stage 2 of the Gillieston Heights URA east precinct road. The proposed access design includes a connection to Aspen Drive to the north and Cessnock Road to the west.

Attending fire services have comprehensive access to the identified bushfire hazards via the proposed perimeter road for hazard reduction and / or fire suppression activities.

The turning head for proposed Road 9 seeks to satisfy Table 5.3b of PBP by way of the Performance Criteria, being:

Firefighting vehicles are provide with safe, all-weather access to structures

Rather than providing a 12 metre outer turning radius turning circle outlined in the Acceptable Solution swept path modelling (Figure 11) has been undertaken to demonstrate that a medium rigid vehicle can perform a turn in a single motion on the proposed reduced turning head in line with Council's design guidelines.

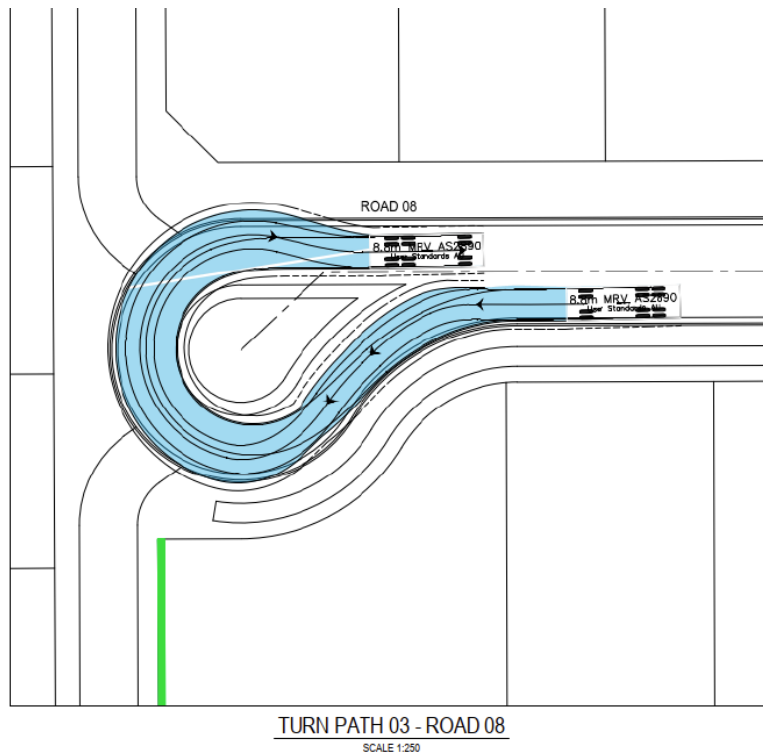


Figure 11: Swept path modelling for Road 8 turning head

All roads will be constructed to the requirements detailed in section 5.3.2 of PBP.

It is noted that a significant portion of the proposed roads are located >100 metres from any bushfire hazard and >30 metres from any grassland hazard (refer to Figure 12 overleaf) and therefore not on land considered to be on 'bushfire prone' land.

One of the general principles underlying Planning for Bush Fire Protection is that protection measures are governed by the degree of threat posed to a development.

As the proposed road carriageways exceed the minimum requirements for Public Roads as detailed in section 5.3.2 of PBP it is requested that the sections of road which is outside the buffer as shown on Figure 12 be excluded from the parking restrictions described in section 5.3.2 of PBP.

This request, while not being common does present itself on large scale subdivisions and has been approved by the NSW Rural Fire Service in the past. The scale of the proposal in our opinion warrants this request.

In consideration of the risk posed to the subject development the proposed access arrangements in conjunction with that already existing are considered adequate.



Figure 12: Subdivision Plan overlaid with 100 metre buffer from bushfire hazard and 30 metre buffer from grassland hazard

Services – Water, electricity & gas

Hydrants are available along Cessnock Road, Main Road, Aspen Drive and surrounding streets for the replenishment of attending fire services. The hydrant system will be extended along the new internal roads to service the proposed residential allotments. The sizing, spacing and pressures of this system must comply with AS2419.1-2021.

There are also several large dams located on the property which currently can be utilised as additional water supplies.

Recommendations will be included to ensure compliance with the electricity and gas services requirements.

Building Construction

No new dwellings are proposed as part of this application.

An independent assessment will be required under s4.14 of the *Environmental Planning and Assessment Act 1997* at the time of any future application for the construction of a new dwelling within the proposed new allotments.

8.04 Aim & Objectives

The following table details the aim and objectives of *Planning for Bush Fire Protection 2019* and the proposals ability to comply.

Aim / Objective	Comment
<p><i>The aim of PBP is to provide for the protection of human life and minimise impacts on property from the threat of bush fire, while having due regard to development potential, site characteristics and protection of the environment.</i></p>	<p>With the inclusion of the recommendations made herein it is of our opinion that the aim of PBP has been satisfied.</p>
<p><i>(i) afford buildings and their occupants protection from exposure to a bush fire;</i></p>	<p>In this instance all proposed allotments can accommodate a building footprint exceeding the minimum required APZs.</p> <p>In conjunction with the application of the relevant Bushfire Attack Level to future dwellings, buildings and their occupants will be afforded protection from exposure to a bushfire.</p>
<p><i>(ii) provide for a defensible space to be located around buildings;</i></p>	<p>The proposed roads and APZs provide a logical defensible space around any future dwelling.</p>
<p><i>(iii) provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent the likely fire spread to buildings;</i></p>	<p>The available APZs in conjunction with the application of the relevant Bushfire Attack Level for the future dwellings will prevent the likely fire spread to buildings.</p>
<p><i>(iv) ensure that appropriate operational access and egress for emergency service personnel and occupants is available;</i></p>	<p>The proposed and existing road network provides operational access and egress for emergency services.</p>

Objective	Comment
<p>(v) provide for ongoing management and maintenance of bush fire protection measures, (BPMs); and</p>	<p>The Asset Protection Zones within the subject site are to be maintained in accordance with the NSW Rural Fire Service’s document ‘Standards for Asset Protection Zones’ and Appendix 4 of <i>Planning for Bush Fire Protection 2019</i>.</p> <p>Any new landscaping within the APZs is to comply with the provisions of Table 7.4a and Appendix 4 of PBP.</p>
<p>(vi) ensure that utility services are adequate to meet the needs of firefighters.</p>	<p>Existing in-ground hydrants are available along Cessnock Road, Main Road, Aspen Drive and surrounding streets for the replenishment of attending fire services.</p> <p>Hydrants will also be extended along the new roads.</p> <p>These hydrants are considered to be the logical water supply for fire services undertaking hazard reduction and / or fire suppression activities.</p>

It is therefore of our opinion that the proposal can satisfactorily comply with the aim and objectives of *Planning for Bush Fire Protection 2019*.

8.05 Submission Detail

Clause 45 of the *Rural Fires Regulation 2022* identifies various items which must be addressed and included within an application for a Bush Fire Safety Authority. The following table outlines these items and includes a corresponding response.

Submission Detail	Response
<i>(a) a description (including the address) of the property on which the development the subject of the application is proposed to be carried out,</i>	See section 7.01
<i>(b) a classification of the vegetation on and surrounding the property (out to a distance of 140 metres from the boundaries of the property) in accordance with the system for classification of vegetation contained in Planning for Bush Fire Protection,</i>	See section 7.02
<i>(c) an assessment of the slope of the land on and surrounding the property (out to a distance of 100 metres from the boundaries of the property),</i>	See section 7.03
<i>(d) identification of any significant environmental features on the property,</i>	Refer to Streamlined Biodiversity Development Assessment Report (AEP 2023)
<i>(e) the details of any threatened species or threatened ecological community under the Biodiversity Conservation Act 2016 that is known to the applicant to exist on the property,</i>	Refer to Streamlined Biodiversity Development Assessment Report (AEP 2023)
<i>(f) the details and location of any Aboriginal object (within the meaning of the National Parks and Wildlife Act 1974) or Aboriginal place (within the meaning of that Act) that is known to the applicant to be situated on the property,</i>	None known within site
<i>(g) a bush fire assessment for the proposed development (including the methodology used in the assessment) that addresses the following matters—</i>	See section 8.0
<i>(i) the extent to which the development is to provide for setbacks, including asset protection zones,</i>	See section 8.03
<i>(ii) the siting and adequacy of water supplies for fire fighting,</i>	See section 8.03
<i>(iii) the capacity of public roads in the vicinity to handle increased volumes of traffic in the event of a bush fire emergency,</i>	<p>Cessnock Road and Aspen Drive were found to generally have a carriageway of ≥10 metres exceeding the perimeter road requirements detailed in PBP.</p> <p>The new roads shall comply with Perimeter roads and Non-Perimeter roads under section 5.3.2 of PBP.</p>

Submission Detail	Response
<i>(iv) whether or not public roads in the vicinity that link with the fire trail network have two-way access,</i>	The immediate surrounding public roads do not link with a registered fire trail network.
<i>(v) the adequacy of arrangements for access to and egress from the development site for the purposes of an emergency response,</i>	See section 8.03
<i>(vi) the adequacy of bush fire maintenance plans and fire emergency procedures for the development site,</i>	There are currently no bush fire maintenance plans or emergency procedures for the development site.
<i>(vii) the construction standards to be used for building elements in the development,</i>	See section 8.03
<i>(viii) the adequacy of sprinkler systems and other fire protection measures to be incorporated into the development,</i>	There is no existing bushfire sprinkler system, nor is one proposed. See section 8.03 for all bushfire protection measures
<i>(ix) any registered fire trails on the property,</i>	There are no registered fire trails within the subject site.

9.0 Recommendations

The following recommendations are provided as the minimum necessary for compliance with *Planning for Bush Fire Protection 2019*. Additional recommendations are provided to supplement these minimum requirements were considered necessary.

General

1. That the proposed development is to comply with the Masterplan prepared by Walker (dwg no AA_08, dated 07.06.23).

Asset Protection Zones

2. At this issue of subdivision certificate and in perpetuity all grounds within the subject property nominated as enforced APZ on Figure 10 of this report shall be maintained in accordance with an Asset Protection Zone (Inner Protection Area) as detailed in the NSW Rural Fire Service's document 'Standards for Asset Protection Zones' and Appendix 4 of *Planning for Bush Fire Protection 2019*.
3. At the issue of a subdivision certificate, suitable instruments shall be created pursuant to section 88B of the Conveyancing Act 1919 over Lots 139-141, 147-148, 430-432 and 545 which prohibit the construction of new buildings other than class 10 structures within the enforced APZ as shown on Figure 10 of this report. The name of the authority empowered to release, vary or modify the instruments shall be Maitland Council.
4. At the issue of a subdivision certificate, suitable instruments shall be created pursuant to section 88B of the Conveyancing Act 1919 over 65 Redwood Drive, Gillieston Heights (Lot 2 DP 1230739) which ensures the establishment and ongoing management of the Asset Protection Zones as shown on the Site Plan – Lots 1 & 2 DP3027451, Lot 1 DP 311179 and Lots 1 & 2 DP601226 prepared by Delfs Lascelles Consulting Surveyors (project no 21404, rev C, dated 13.06.23)
5. That temporary APZs shall be provided between each stage of the proposal until such time the adjacent stage is developed. The temporary APZs are to have a minimum depth of 50 metres and are not to encroach within management zones 1 and 2 as shown in the Biodiversity Management Plan prepared by AEP (ref 2665.03, rev 02, dated 16.06.2023).

Services (where applicable)

Water:

6. That the new hydrant system is to comply with the requirements detailed in Table 5.3c of *Planning for Bush Fire Protection 2019*, specifically:
 - fire hydrant spacing, design and sizing comply with the relevant clauses of AS 2419.1:2021;
 - hydrants are not located within any road carriageway;
 - fire hydrant flows and pressures comply with the relevant clauses of AS 2419.1:2021.
 - all above-ground water service pipes external to the building are metal, including and up to any taps.

- fire hose reels are constructed in accordance with AS/NZS 1221:1997 Fire hose reels, and installed in accordance with the relevant clauses of AS 2441:2005 Installation of fire hose reels.

Electricity:

7. Any new electrical services must comply with section 5.3.3 of *Planning for Bush Fire Protection 2019*, specifically:
 - where practicable, electrical transmission lines are underground.
 - 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 *ISSC3 Guideline for Management Vegetation Near Power Lines*.

Gas:

8. Any new gas services must comply with section 5.3.3 of *Planning for Bush Fire Protection 2019*, specifically:
 - reticulated or bottled gas is installed and maintained in accordance with AS/NZS 1596:2014 - *The storage and handling of LP Gas*, the requirements of relevant authorities, and metal piping is used;
 - all fixed gas cylinders are kept clear of all flammable materials to a distance of 10m and shielded on the hazard side;
 - connections to and from gas cylinders are metal;
 - polymer-sheathed flexible gas supply lines are not used; and
 - above-ground gas service pipes are metal, including and up to any outlets.

Access

9. That the new internal roads shall comply with the following requirements for Non-Perimeter Roads as detailed in Table 5.3b of PBP, specifically:
 - property access roads are two-wheel drive, all-weather roads;
 - traffic management devices are constructed to not prohibit access by emergency services vehicles;
 - maximum grades for sealed roads do not exceed 15 degrees and an average grade of not more than 10 degrees or other gradient specified by road design standards, whichever is the lesser gradient;
 - 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.
 - hydrants are located outside of parking reserves and road carriageways to ensure accessibility to reticulated water for fire suppression;
 - hydrants are provided in accordance with the relevant clauses of AS 2419.1:2021 - Fire hydrant installations System design, installation and commissioning;

- minimum 5.5m carriageway width kerb to kerb;
- parking is provided outside of the carriageway width;
- curves of roads have a minimum inner radius of 6m;
- the road crossfall does not exceed 3 degrees; and
- a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided.

Note: The parking restrictions shall not apply to the section of road that is not located on 'bushfire prone' land (i.e. within 100m of a bushfire hazard as per Figure 10 of this report).

10. That the proposed roads interfacing the retained Rainforest and Forest shall comply with the requirements for Perimeter Roads as detailed in Table 5.3b of PBP, specifically:

- are two-way sealed roads;
- minimum 8m carriageway width kerb to kerb;
- parking is provided outside of the carriageway width; hydrants are located clear of parking areas;
- are through roads, and these are linked to the internal road system at an interval of no greater than 500m;
- curves of roads have a minimum inner radius of 6m;
- the maximum grade road is 15 degrees and average grade of not more than 10 degrees;
- the road crossfall does not exceed 3 degrees; and
- a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided.

10.0 Conclusion

The proposed development seeks consent for the creation of three hundred and twenty-two (322) new residential allotments, drainage reserves, open space reserves, residue lot and construction of associated infrastructure.

Maitland City Council Bushfire Prone Land Map (BPLM) has identified the site as containing Category 3 Vegetation and Vegetation Buffer is therefore considered 'bushfire prone'.

The subject development relates to the subdivision of bushfire prone land which can be lawfully used for residential purposes and is therefore classified as integrated development under section 4.46 of the *Environmental Planning and Assessment Act* 1979. The development is captured under section 100B of the *Rural Fires Act* 1997 and must obtain a Bush Fire Safety Authority from the Commissioner of the NSW Rural Fire Service.

All property development within bushfire affected areas is subject to the relevant specifications and requirements detailed in the document 'Planning for Bush Fire Protection - 2019' (PBP).

In accordance with the bushfire safety measures contained in this report, and consideration of the site specific bushfire risk assessment it is our opinion that when combined, they will provide a reasonable and satisfactory level of bushfire protection to the subject development.

We are therefore in support of the 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

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Diploma of Engineering
FPA Australia BPAD Level 2 Accredited Practitioner
BPAD Accreditation No. BPAD46966



11.0 Annexure 01

List of Referenced Documents

AEP (2023). Streamlined Biodiversity Development Assessment Report (Small Area and Planted Native Vegetation) – Residential Subdivision at 527, 507, 501, 463 & 457 Cessnock Rd Gillieston Heights, NSW (project no 2665.02, dated 16 June 2023)

AEP (2023). Biodiversity Management Plan (ref 2665.03, rev 02, dated 16.06.2023)

Australian Building Codes Board (2022). *National Construction Code Volume Two - Building Code of Australia*. ABCB

Delfs Lascelles Consulting Surveyors (2023). Site Plan – Lots 1 & 2 DP3027451, Lot 1 DP 311179 and Lots 1 & 2 DP601226 (project no 21404, rev C, dated 13.06.23)

ELVIS -Elevation -Foundation Spatial Data. Elevation.fsdf.org.au. Available at: <http://elevation.fsdf.org.au/>

Environmental Planning and Assessment Act 1979

Maitland City Council (2011). *Maitland Development Control Plan*

NSW Department of Planning and Environment (2019). *Planning Portal*. Accessed at: <https://www.planningportal.nsw.gov.au/>

NSW Rural Fire Service (2019). *Planning for Bush Fire Protection. A Guide for Councils, Planners, Fire Authorities and Developers*.

NSW Rural Fire Service (2022). Addendum to *Planning for Bush Fire Protection*.

Rural Fires Act 1997

Rural Fires Regulations 2022

Rural Fire Service NSW (2005). *Standards for Asset Protection Zones*

Rural Fire Service NSW (2017). *NSW Local Government Areas FDI*

Standards Australia (2018). *AS3959 Construction of buildings in bushfire-prone areas*.

Standards Australia (2014). *AS/NZS 1596 The storage and handling of LP Gas*

Walker (2023). Subdivision Plan, dwg no AA_08, dated 07.06.23

Acknowledgements to:

Geoscience Australia
Nearmap
Street-directory.com.au

Attachments

Attachment 01: Short Fire Run modelling

Attachment 02: Letter of intent to establish easement



NBC Bushfire Attack Assessment Report V4.0

AS3959 (2018) Appendix B - Detailed Method 2

Print Date: 9/06/2023

Assessment Date: 2/05/2023

Site Street Address: South Gillieston Heights, Gillieston Heights

Assessor: Stuart McMonnies; Bushfire Hazard Solutions

Local Government Area: Maitland

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

Short Fire Run - Methodology for Assessing Bush Fire Risk for Low Risk Vegetation May 2019; NSW RFS

Run Description: East

Vegetation Information

Vegetation Type: Rainforest

Vegetation Group: Forest and Woodland

Vegetation Slope: 30 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: 2 Degrees

Site Slope Type: Downslope

Elevation of Receiver(m) Default

APZ/Separation(m): 40

Fire Inputs

Veg./Flame Width(m): 32.94

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 FZ

Peak Elevation of Receiver(m): 13.94

Radiant Heat(kW/m²): 28.93

Flame Angle (degrees): 36

Flame Length(m): 52.2

Maximum View Factor: 0.456

Rate Of Spread (km/h): 9.51

Inner Protection Area(m): 40

Transmissivity: 0.834

Outer Protection Area(m): 0

Fire Intensity(kW/m): 64857

Short Fire Run Calculations

Fire Run(m): 90

Length to Breadth Ratio: 2.82

Full Ellipse Length(m): 318.54

Headfire Backfire Ratio: 29.85

Travel Duration (mins): 0.57

Total Ellipse Length(m): 93.01

ROS and H/B Ratio: 163.81