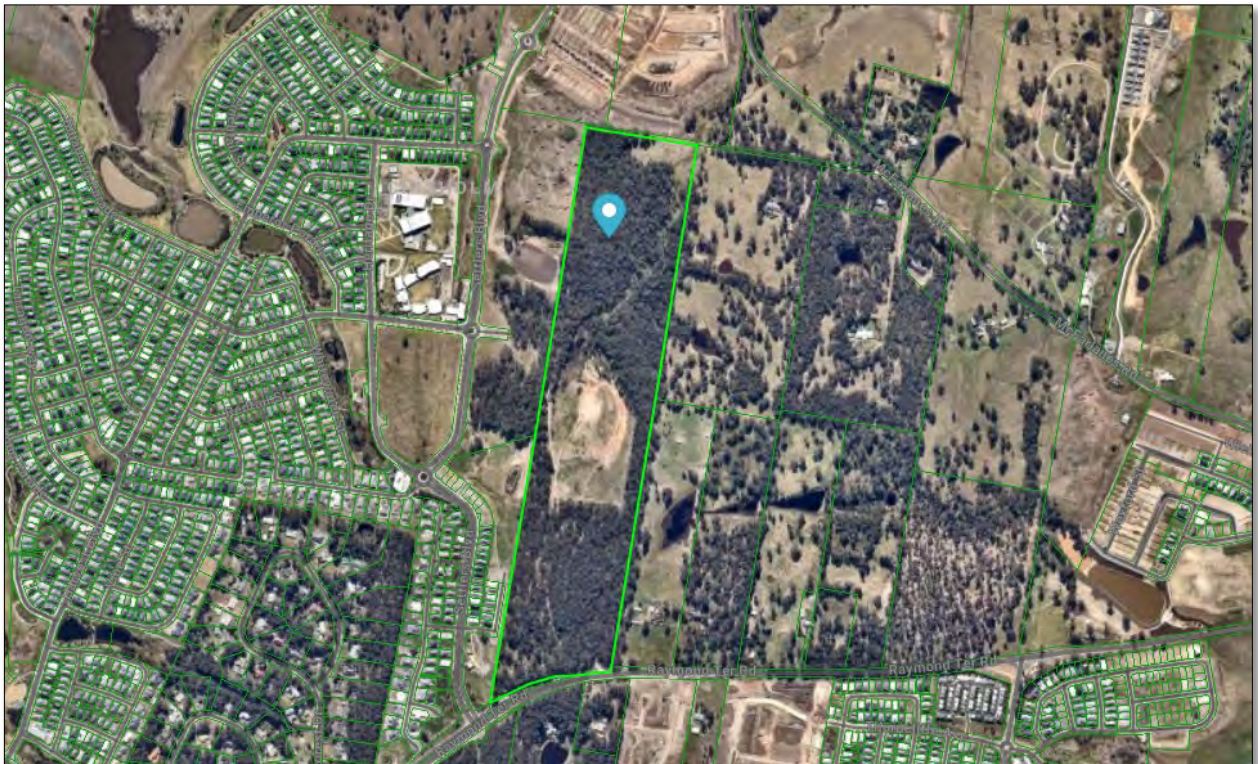


BUSHFIRE ASSESSMENT REPORT

CSR Development

487 Raymond Terrace Road and 2 Settlers Boulevard, Chisholm

Prepared for: Avid Property Group Pty Ltd



Bushfire Planning Australia

Stuart Greville
Accredited Bushfire Practitioner
BPAD-26202
☎ 0400 917 792
✉ stuart@bfpa.com.au

Prepared for: Avid Property Group
c/- AdW Johnson
Stephanie van Dissell

Reference: 2171A
Version: FINAL – 8 December 2021

Disclaimer and Limitation

This report is prepared solely for the Avid Property Group Pty Ltd (the 'Client') for the specific purposes of only for which it is supplied (the 'Purpose'). This report is not for the benefit of any other person; either directly or indirectly and is strictly limited to the purpose and the facts and matters stated in it and will not be used for any other application.

This report is based on the site conditions surveyed at the time the document was prepared. The assessment of the bushfire threat made in this report is made in good faith based on the information available to Bushfire Planning Australia at the time.

The recommendations contained in this report are considered to be minimum standards and they do not guarantee that a building or assets will not be damaged in a bushfire. In the making of these comments and recommendations it should be understood that the focus of this document is to minimise the threat and impact of a bushfire.

Finally, the implementation of the adopted measures and recommendations within this report will contribute to the amelioration of the potential impact of any bushfire upon the development, but they do not and cannot guarantee that the area will not be affected by bushfire at some time.

Document Status: 2171A - Bushfire Assessment Report

Version	Status	Purpose	Author	Review Date
1	Draft	Draft for Review	Katrina Mukevski	25 November 2021
2	Draft	Draft for Client Review	Stuart Greville	8 December 2021
3	Final	Final for Submission	Stuart Greville	9 December 2021

Certification

As the author of this Bushfire Threat Assessment (BAR), I certify this BAR provides the detailed information required by the NSW Rural Fire Service under Clause 44 of the Rural Fires Regulation 2013 and Appendix 2 of Planning for Bushfire Protection 2019 for the purposes of an application for a bush fire safety authority under section 100B(4) of the Rural Fires Act 1997.



Stuart Greville

Accredited Bushfire Practitioner

BPAD-26202

Date: 9 December 2021



In signing the above, I declare the report is true and accurate to the best of my knowledge at the time of issue.

Executive Summary

Bushfire Planning Australia (BPA) has been engaged by Avid Property Group Pty Ltd (the 'Client') to undertake a Bushfire Assessment Report (BAR) for the proposed subdivision of 487 Raymond Terrace Road and 2 Settlers Boulevard, Chisholm (the 'subject site'); legally known as Lot 4 DP1145348 and Lot 5200 DP1247841. The proposed development comprises a 193 Torrens title residential subdivision to be constructed in two (2) stages. The proposed subdivision will connect to previous stages of the Waterford development to the west of the site.

This BAR found the site is currently exposed to a medium bushfire hazard to the east of the site and there is a high bushfire hazard throughout the site; surrounding the disturbed land that was cleared during the former quarry operation. Large areas of the existing vegetation throughout the site will be retained, accordingly the area of the site to be developed will continue to be exposed to a high bushfire hazard; mainly to the north, but also the section of vegetation to be retained in the southeast corner of the site.

The predominant vegetation currently surrounding the site is consistent with a *Forest (Hunter Macleay Dry Sclerophyll Forest)* vegetation formation as described in the NSW Rural Fire Service document Planning for Bushfire Protection 2019 (PBP 2019). As the predominant vegetation class is a type of grassy forest, a Performance based solution has been designed to allow for the site specific characteristics; specifically the fuel load associated with a grassy forest.

The site is identified as the Thornton North Urban Release Area in the Maitland Local Government Area Bush Fire Planning – Urban Release Area Map. Accordingly, to benefit from the exemptions permitted under clause 273 of the Environmental Planning and Assessment Regulations 2000 (EP&A Regs) and in accordance with the NSW Rural Fire Service (RFS) User Guide for Subdivision of Urban Release Areas on Bush Fire Prone Land, a Subdivision BAL Plan has been prepared and is contained in **Appendix E**. As part of the application for a Bush Fire Safety Authority (BFSA) under section 100b of the Rural Fires Act 1997 (RF Act), we are also seeking endorsement of the Subdivision BAL Plan prior to the registration of the subdivision.

The BAR concludes the bushfire hazard the proposed development is exposed to can be successfully mitigated by applying a combination of bushfire mitigation measures including temporary and permanent Asset Protection Zones (APZs).

In summary, the following key recommendations have been designed to enable the proposed residential development to achieve the aims and objectives of PBP 2019:

1. The entire site shall be managed as an Inner Protection Area (IPA) as outlined within Appendix 4 of PBP 2019 and the RFS document Standards for asset protection zones;
2. The APZs shown in **Figure 13 – Subdivision BAL Plan** shall be maintained in perpetuity in accordance with the requirements of Appendix 4 of PBP 2019;
3. Access shall be provided in accordance with Table 5.3b of PBP 2019. This will require the provision of a minimum of two (2) separate road access points provided from the development site to the west to ensure safe evacuation for all residents;
4. All temporary turning heads shall be constructed in accordance Appendix A3.3 of PBP 2019;
5. Vegetation within road verges (including swales) to be consistent with a grassland vegetation classification with tree canopy less than 10% at maturity (and considered unmanaged);
6. The Bushfire Attack Level (BAL) ratings identified in **Figure 13 – Subdivision BAL Plan** apply to all future dwellings to be constructed on the proposed lots. All future dwellings to be constructed on the proposed lots shall have due regard to the specific considerations given in the National Construction Code: Building Code of Australia (BCA) which makes

specific reference to Australian Standard AS3959-2018 Construction of buildings in bushfire prone areas (AS3959-2018) and the NASH Standard Steel Framed Construction in Bushfire Prone Areas;

7. All new lots are to be connected to a reliable water supply network and that suitable fire hydrants are located throughout the development site that are clearly marked and provided for the purposes of bushfire protection. Fire hydrant spacing, sizing and pressure shall comply with AS2419.1 2005 and section 5.3.3 of PBP 2019; and
8. Consideration should be given to landscaping and fuel loads on site to decrease potential fire hazards on site.

This assessment has been made based on the bushfire hazards observed in and around the site at the time of inspection and production (December 2021) and demonstrates the development has satisfied the aims and objectives of Planning for Bushfire Protection 2019.

Finally, should the above recommendations be implemented, the existing bushfire risk should be suitably mitigated to offer an acceptable level of protection to life and property for those persons and assets occupying the site but they do not and cannot guarantee that the area will not be affected by bushfire at some time and that property and life damage/loss will not occur.



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Appendix A: Plan of Proposed Residential Subdivision

Appendix B: AHIMS Search Results

Appendix C: NBC Bushfire Attack Assessor V4.1 Report

Appendix D: Planning for Bushfire Protection 2019 Compliance Table

Appendix E: Subdivision BAL Plan – Bushfire Planning Australia dated 9 December 2021

Terms and Abbreviations

Abbreviation	Meaning
APZ	Asset Protection Zone
AS2419-2005	Australian Standard – Fire Hydrant Installations
AS3959-2018	Australian Standard – Construction of Buildings in Bush Fire Prone Areas
BAR	Bushfire Assessment Report
BCA	Building Code of Australia
BC Act	NSW Biodiversity Act 2016
BMP	Bush Fire Management Plan
BPA	Bush Fire Prone Area (Also Bushfire Prone Land)
BPL	Bush Fire Prone Land
BPLM	Bush Fire Prone Land Map
BPM	Bush Fire Protection Measures
BFSA	Bush Fire Safety Authority
BURA	Bush Fire Urban Release Area
DoE	Commonwealth Department of the Environment
DPI Water	NSW Department of Primary Industries – Water
EP& A Act	NSW Environmental Planning and Assessment Act 1979
EP&A Regs	NSW Environmental Planning and Assessment Regulation 2000
EPBC Act	Commonwealth Environment Protection and Biodiversity Conservation Act 1999
FDI	Fire Danger Index
FMP	Fuel Management Plan
ha	hectare
IPA	Inner Protection Area
LGA	Local Government Area
MCC	Maitland City Council
OPA	Outer Protection Area
OEH	NSW Office of Environment and Heritage
PBP 2019	Planning for Bushfire Protection 2019
RF Act	Rural Fires Act 1997
RF Regulation	Rural Fires Regulation
RFS	NSW Rural Fire Service
TSC Act	NSW Threatened Species Conservation Act 1995 (as repealed)

1. Introduction

Bushfire Planning Australia (BPA) has been engaged by Avid Property Group Pty Ltd (the 'Client') to undertake a Bushfire Assessment Report (BAR) for the proposed subdivision of 487 Raymond Terrace Road and 2 Settlers Boulevard, Chisholm (the 'subject site'); legally known as Lot 4 DP1145348 and Lot 5200 DP1247841. The proposed development comprises a 193 Torrens title residential subdivision to be constructed in two (2) stages. The proposed subdivision will connect to previous stages of the Waterford development to the west of the site.

The assessment aims to provide a bushfire risk assessment which considers and assesses the bushfire hazard and associated potential bushfire threat relevant to the proposed development on a landscape scale. The assessment outlines the minimum mitigative measures which would be required in accordance with the BAR, provisions of the New South Wales Rural Fire Service (RFS) publication *Planning for Bushfire Protection 2019* (PBP 2019) and the *Rural Fires Regulation 2013*.

1.1. Aims and Objectives

This BAR aims to assess the bushfire threat and recommends a series of bushfire protection measures that aim to minimise the risk of adverse impact of bush fires on life, property and the environment.

This assessment has been undertaken in accordance with Appendix 2 of *Planning for Bushfire Protection 2019* and clause 44 of the *Rural Fires Regulation 2013*. This assessment also addresses the aim and objectives of PBP 2019, being:

- Afford buildings and their occupants protection from exposure to a bushfire;
- Provide for a defendable space to be located around buildings;
- Provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent the likely fire spread to buildings;
- Ensure that appropriate operational access and egress for emergency service personnel and occupants is available;
- Provide for ongoing management and maintenance of bushfire protection measures (BPMs); and
- Ensure that utility services are adequate to meet the needs of firefighters.

2. Site Description

Table 1: Site Description

Address	487 Raymond Terrace Road, Chisholm 2 Settlers Boulevard, Chisholm
Title	Lot 4 DP1145348 Lot 5200 DP1247841
LGA	Maitland City Council
Subject Site/ Study Area	38.79 ha
Development Site	~16 ha
Land Use Zone	R1 General Residential and E3 Environmental Management (Figure 1)
Bushfire Prone Land	Yes - Vegetation Category 1 and Vegetation Buffer (Figure 3)
Context	The site is located to the north of Raymond Terrace Road, Chisholm. It is an expansion of an existing residential subdivision adjoining Stages 51, 52 and 54 of the Waterford development. The site is predominantly vegetated with exception of a former quarry, now cleared lands. This site and the surrounding development are located within the Thornton North Urban Release Area.
Topography	Undulating, no more than 10m at its deepest point
Fire History	No (recorded) fire history directly impacting site. FFDI 100

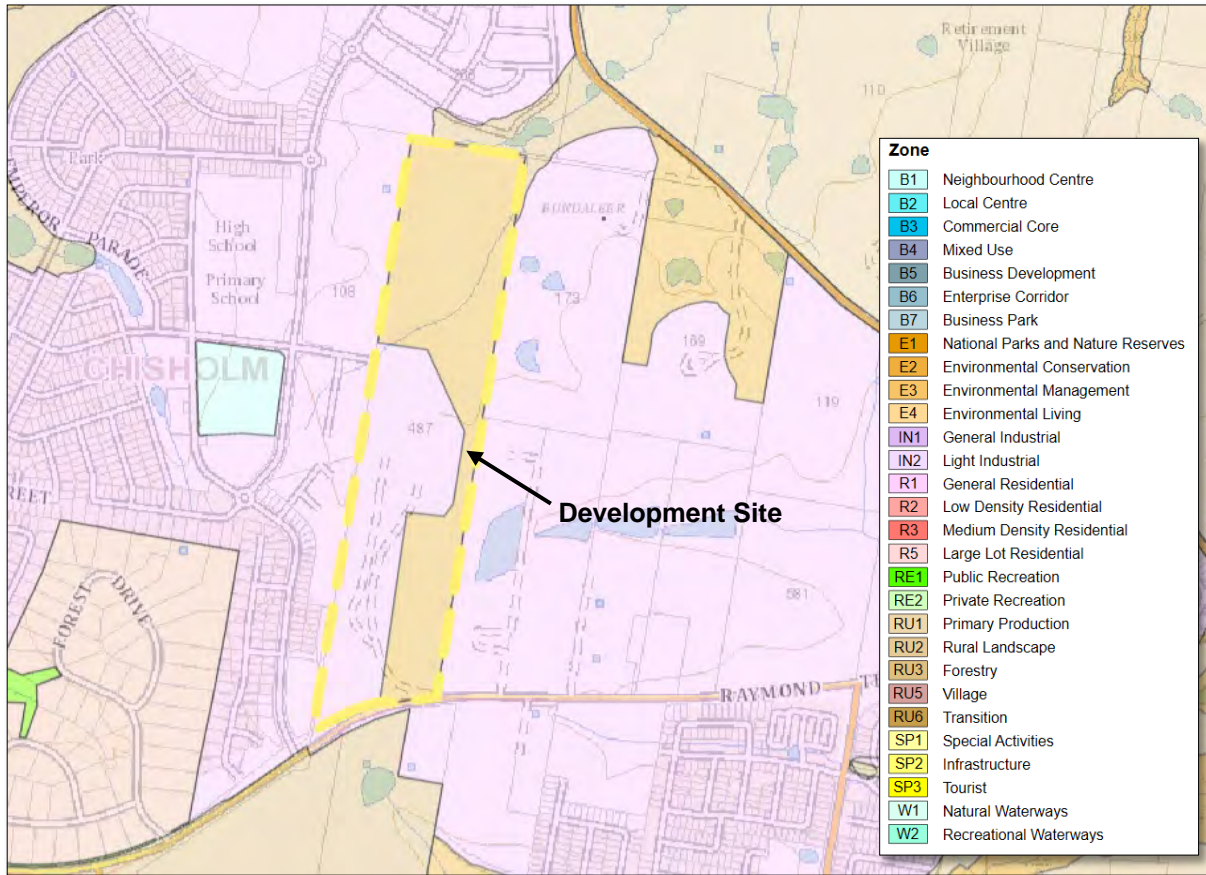
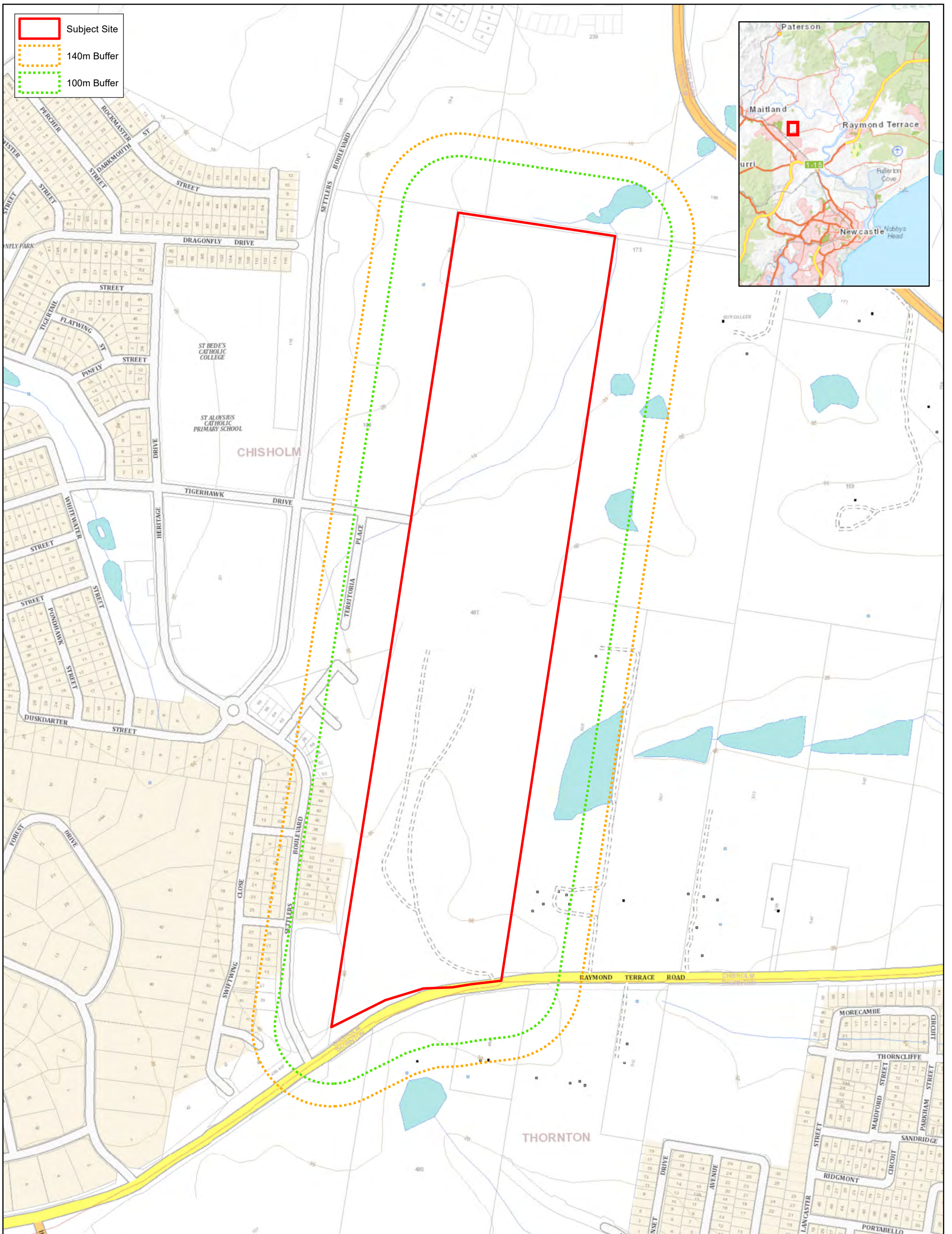
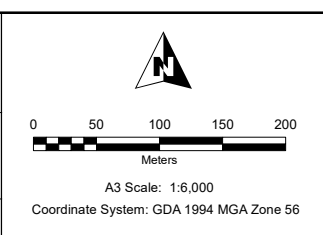


Figure 1: Land Use Zone Map (Maitland Local Environment Plan 2011)



Source:	Base Map © Department of Customer Service 2020 © Commonwealth of Australia (Geoscience Australia) 2016. Creative Commons Attribution 4.0 International Licence.
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File:	File: 2171-ChisholmAvid-Fig1-SiteLocation-210930 Date: 30/09/2021



**Project: Chisholm
- Avid
Job no: 2171**

**Figure 2:
Site
Location**

2.1. Background

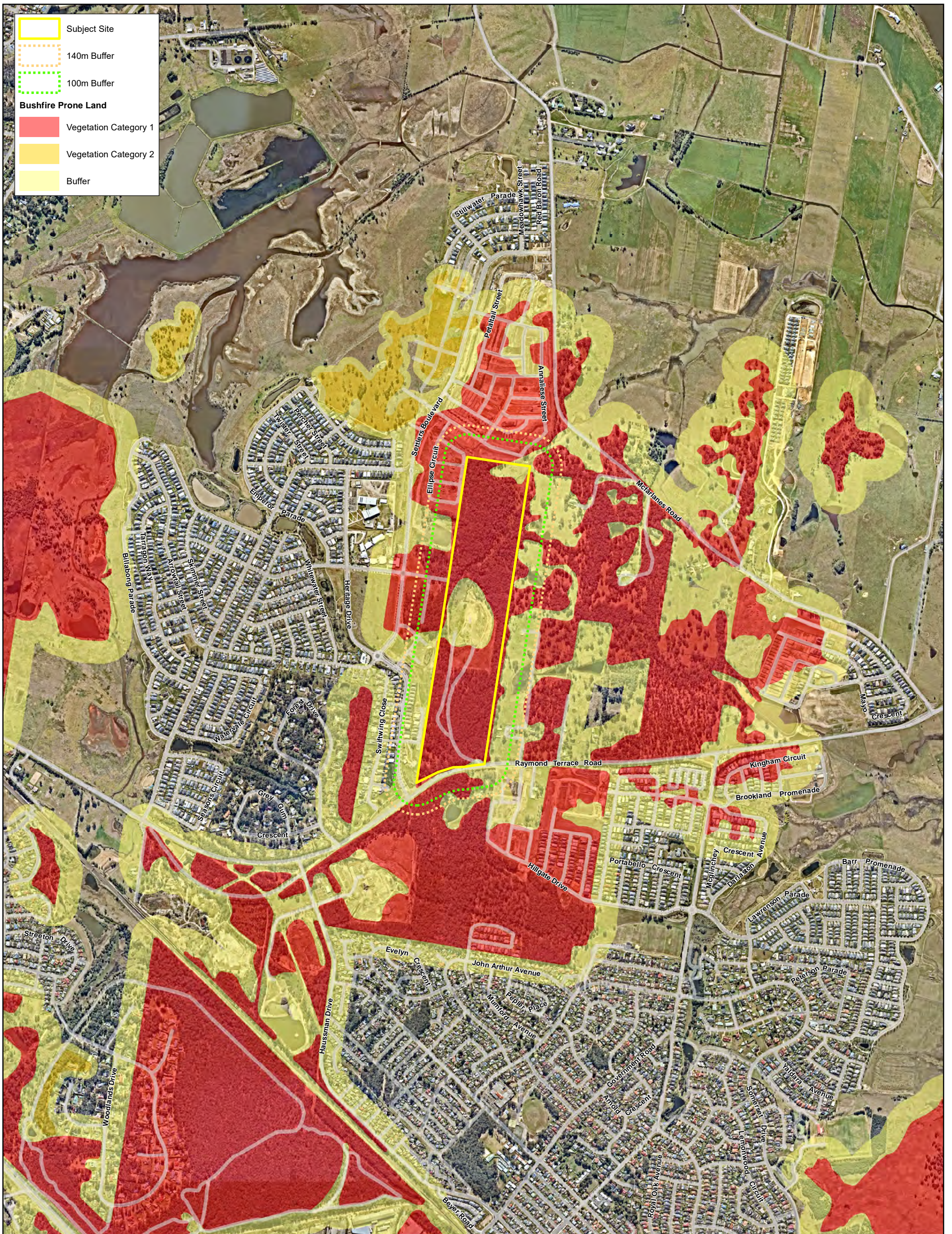
The CSR site is located within the Thornton North Urban Release Area which was designed ensure urban growth takes place in a co-ordinated and sustainable manner. Maitland City Council prepared the master plan to provide a logical framework for the progressive development of the urban release area. In some instances, the development of certain parcels of land relied on adjoining landowners to provide public road connections to facilitate the orderly development.

The proposed development is a continuation of the Waterford residential estate and will directly connect to existing stages to the west of the site; including Stages 51, 52, 54 & 56. Apart from the vegetation to be retained within the site; all surrounding land is zoned for residential use and development applications have been submitted, or in the process of being submitted for many of the properties to the north and east of the site.


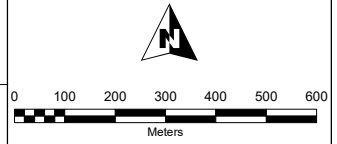
2.2. Bushfire Prone Land

Bushfire activity is prevalent in landscapes that carry fuel and the two predominant bushfire types are grassland and forest fires. Factors such as topographic characteristics and quantity of fuel loads influence the intensity and spread of fire. The scale of a bushfire hazard is tailored to the characteristics of the hazard, the size and characteristics of the affected population, types of land use exposed to bushfire, predicted development growth pressures and other factors affecting bushfire risk.

Figure 3 demonstrates that the majority of the site is mapped as a bushfire Vegetation Category 1. There is also Vegetation Buffer located in the middle of the site where a quarry formerly existed and the northern end of the site, both now cleared land. The majority of land further east that is currently mapped as Vegetation Category 1 is likely to be cleared as part of the ongoing development of the Thornton North Urban Release Area.



Subject Site
 140m Buffer
 100m Buffer
Bushfire Prone Land
 Vegetation Category 1
 Vegetation Category 2
 Buffer

 <p>BUSHFIRE PLANNING AUSTRALIA</p>	Source: Cadastral Boundary: NSW Department of Finance, Services and Innovation 2021 Aerial photo: NearMap 06/08/2021 NSW Bush Fire Prone Land: NSW Rural Fire Service 2018	 <p>0 100 200 300 400 500 600 Meters</p> <p>A3 Scale: 1:15,000 Coordinate System: GDA 1994 MGA Zone 56</p>	<p>Project: Chisholm - Avid Job no: 2171</p>	<p>Figure 3: NSW Bush Fire Prone Land</p>	
	Disclaimer: No warranty is given in relation to the data (including accuracy, reliability, completeness, currency or suitability) and no liability is accepted (including without limitation, liability in negligence) for any loss, damage or costs (including consequential damage) relating to any use of the data. Data must not be used for direct marketing or be used in breach of the privacy laws.				
	File: File: 2171-ChisholmAvid-Fig2-BFPL-211209 Date: 9/12/2021				

2.3. Fire History

There is no recorded evidence of recent bushfires at the site itself and the surrounding area. However during the site inspection fire scars were observed on numerous trees indicating previous fire events.

2.4. Proposed Development

The proposed development seeks consent for a residential subdivision that will create 193 Torrents Title residential lots and one (1) residue lot delivered in two (2) stages as follows:

- ❑ Stage 1 = 103 residential lots
- ❑ Stage 2 = 90 residential lots

The plan of subdivision is contained in **Appendix A** and shown in **Figure 4**.

The site will have vehicle access from Settlers Boulevard through Stages 51, 54 and 56. Consequently, the site will not be able to be developed until the completion of the public roads within the adjoining approved subdivision along the western boundary. Provision has also been made for a future road connection to the east.



Figure 4: Plan of proposed subdivision

3. Bushfire Hazard Assessment

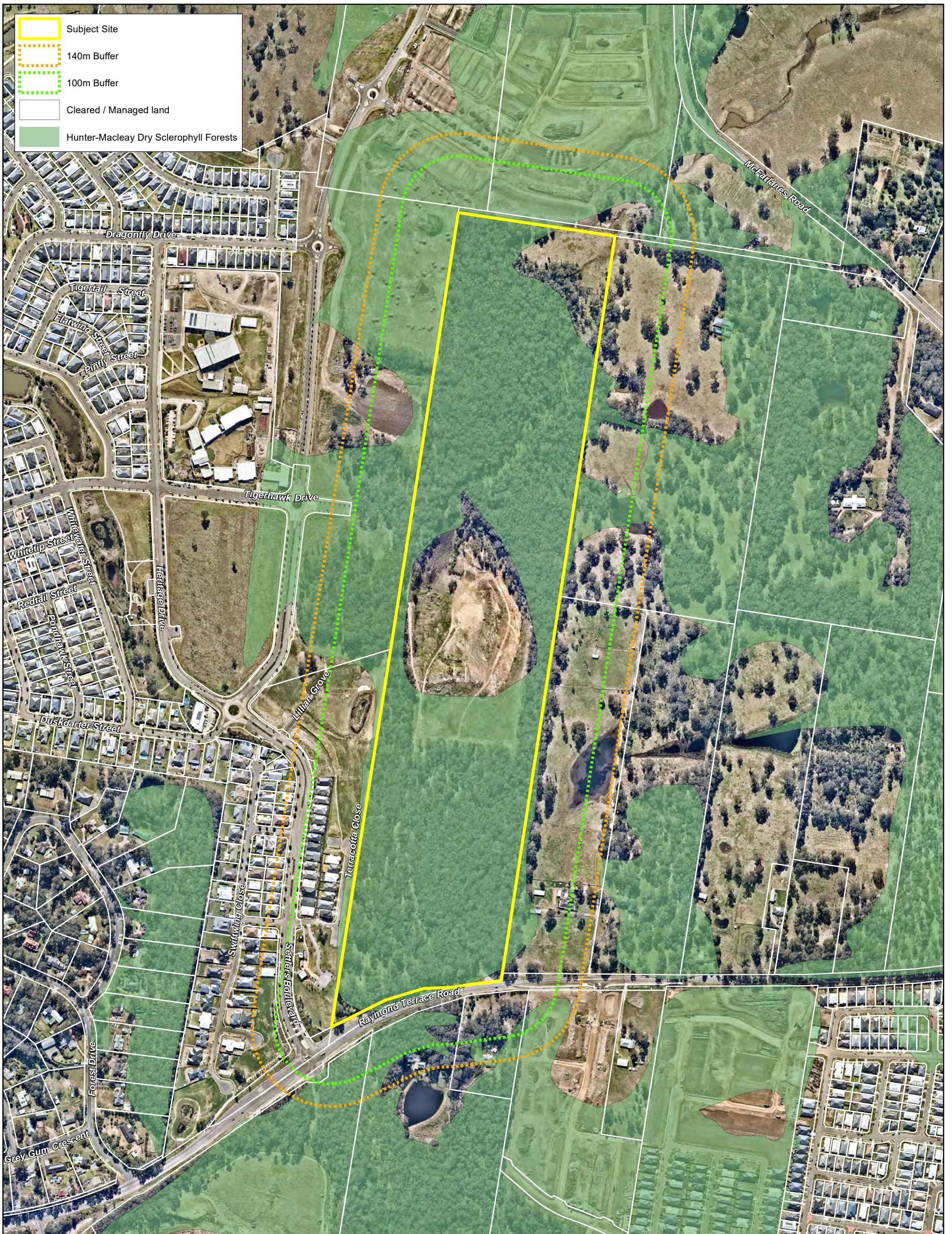
The bushfire hazard assessment will involve quantitative and qualitative assessments of the site. The quantitative assessment includes a detailed site inspection to record and review vegetation communities, slope and aspect both within and surrounding the site. The qualitative assessment will be based on the known bushfire behaviour of the subject land.

3.1. Vegetation Assessment

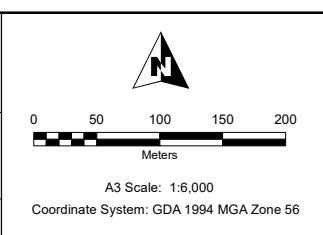
Vegetation classification over the site and surrounding area has been carried out as follows:

- ❑ Aerial Photograph Interpretation to map the vegetation classification and extent (NearMap historical series);
- ❑ Site Inspection on 18 November 2021 by Stuart Greville (BPA);
- ❑ Review of Greater Hunter Native Vegetation Mapping v4.0 VIS ID 3855 OEH 2009 (**Figure 5**); and
- ❑ Lower Hunter Vegetation Mapping - Keith Formations (**Figure 6**).

In accordance with PBP 2019, an assessment of the vegetation over a distance of 100m in all directions from the site was undertaken. Vegetation that may be considered a bushfire hazard was identified in all directions from the development footprint. The vegetation classification is based on Appendix 1 of PBP 2019; per Keith (2004). The unmanaged fuel loads detailed in the *Comprehensive Vegetation Fuel Loads* published by the RFS in March 2019 have been adopted for the purpose of assessing the bushfire hazard. The findings of the site inspection were compared to the Keith Vegetation Formations mapping provided by the NSW RFS. The inconsistencies between the mapping sources were quantified during the site inspection.

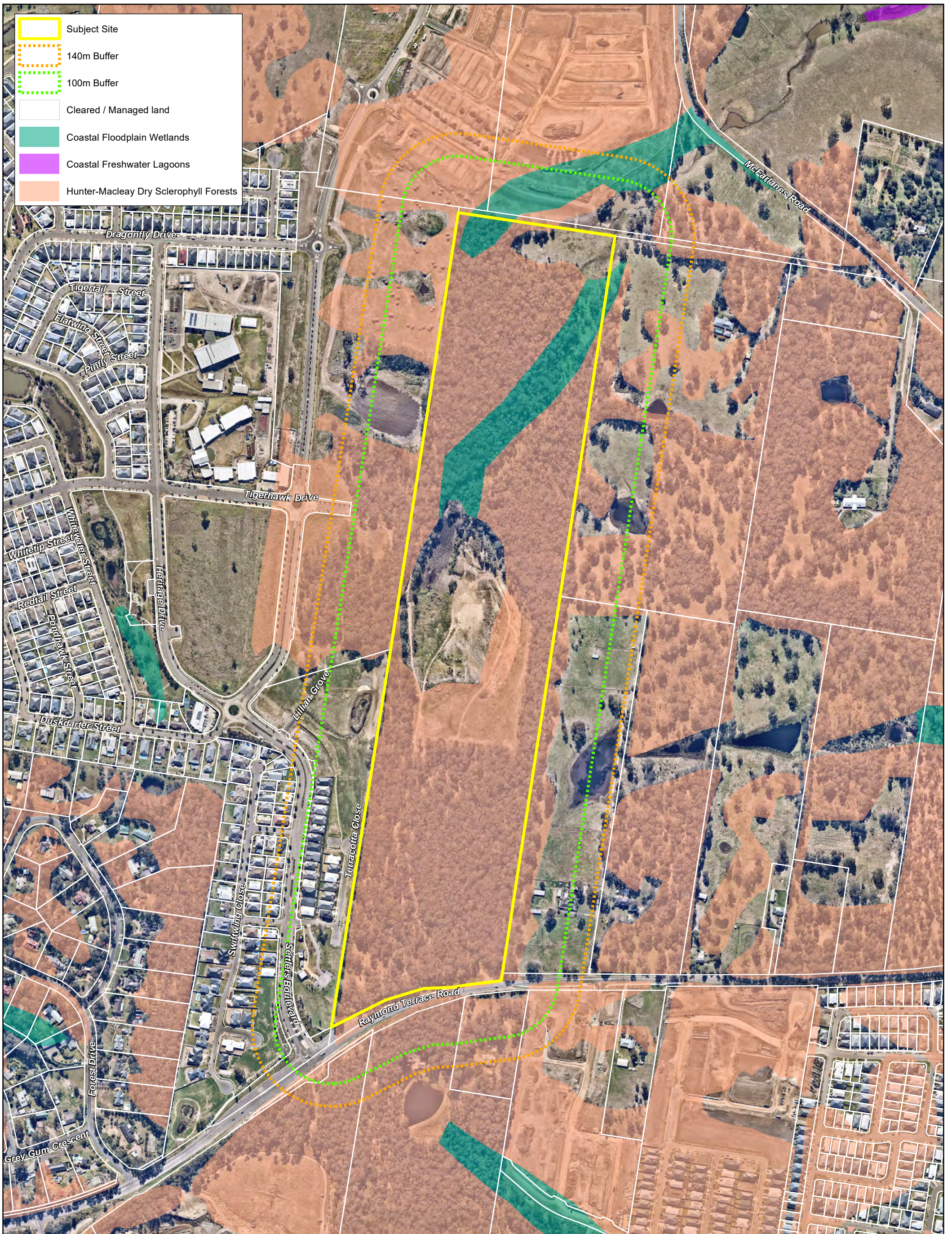


Source:	Cadastral Boundary: NSW Department of Finance, Services and Innovation 2021 Aerial photo: NearMap 16/06/21 Vegetation: Greater Hunter Native Vegetation Mapping v4.0. VIS ID 3855 OEI 2009
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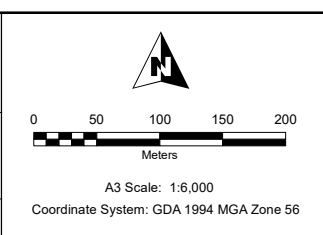
**Figure 5:
Greater Hunter
Native Vegetation**



- Subject Site
- 140m Buffer
- 100m Buffer
- Cleared / Managed land
- Coastal Floodplain Wetlands
- Coastal Freshwater Lagoons
- Hunter-Macleay Dry Sclerophyll Forests



Source:	Cadastral Boundary: NSW Department of Finance, Services and Innovation 2021 Aerial photo: NearMap 16/06/21 Lower Hunter Vegetation Mapping © State Government of NSW Department of Agriculture, Water and the Environment 2013
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**Project: Chisholm
- Avid
Job no: 2171**

**Figure 6:
Vegetation
(Lower Hunter)**



Plate 1: Subject site looking northeast from Raymond Terrace Road



Plate 2: Subject site looking south



Plate 3: Looking north west across adjoining property



Plate 4: All vegetation along western boundary will be cleared and developed



Plate 5: Typical grassy forest vegetation across Transect T4



Plate 6: Evidence of moderate weed invasion through grassy forest across Transect T5



Plate 7: A narrow band (<40m wide) of grassy forest will be retained along eastern boundary (T8)



Plate 8: Typical open grassy forest between Transects T10 and T11



Plate 9: Narrow corridor of forest vegetation south of Raymond Terrace Road (T14)



Plate 10: Land affected by former quarry devoid of all mature vegetation

3.2. Slope Assessment

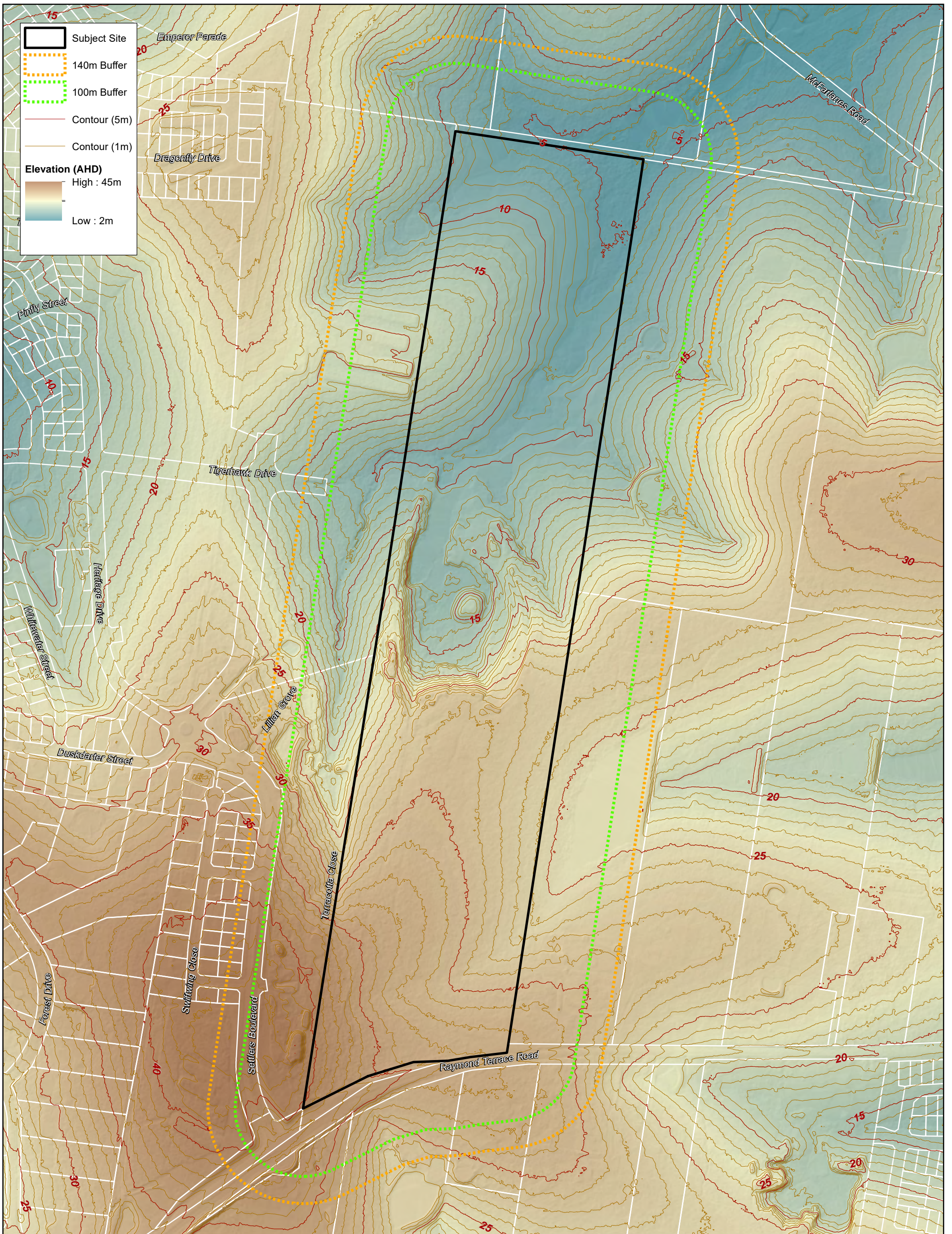
The slope assessment was undertaken as follows:



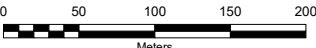
- ❑ Review of LiDAR point cloud data – including DEM (NSW LPI).

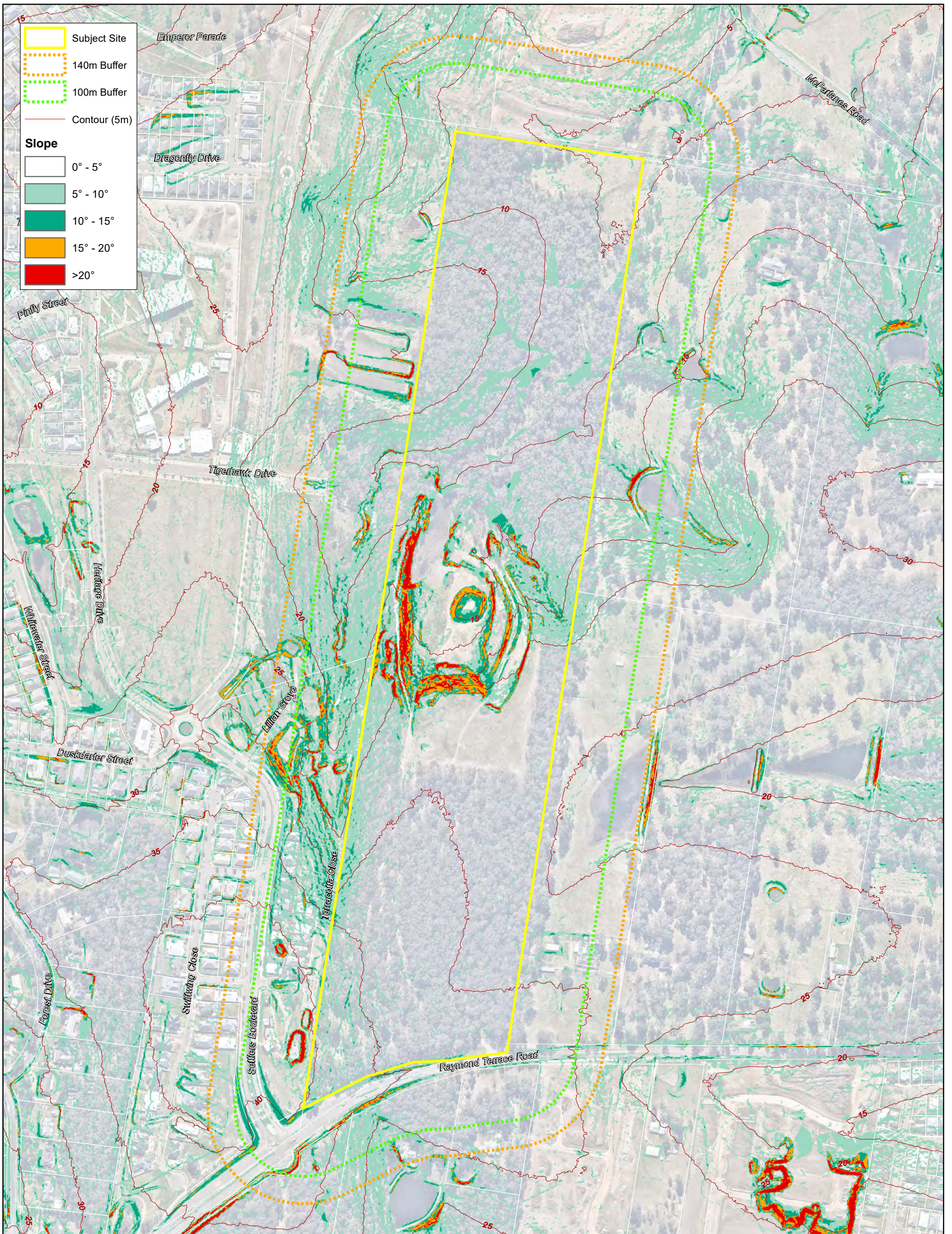
An assessment of the slope over a distance of 140m in the hazard direction from the site boundary was undertaken. The effective slope was then calculated under the classified vegetation where there was a fire run greater than 50m. The topography of the site has been evaluated to identify both the average slope and by identifying the maximum slope present. These values help determine the level of gradient which will most significantly influence the fire behaviour of the site.

A series of figures were produced that demonstrate the slope within 140m of the site from the subject site in several formats, including:

- ❑ Digital Elevation Model – **Figure 7**; and
- ❑ Slope analysis in gradients of 5 degrees – **Figure 8**.



 <p>BUSHFIRE PLANNING AUSTRALIA</p>	<p>Source: Cadastral Boundary: NSW Department of Finance, Services and Innovation 2021 Surface analysis based on Newcastle 1 metre Resolution Digital Elevation Model © Department Finance, Services and Innovation 2012</p>	  <p>A3 Scale: 1:5,000 Coordinate System: GDA 1994 MGA Zone 56</p>	<p>Project: Chisholm - Avid Job no: 2171</p>	<p>Figure 7: Digital Terrain Model</p>
	<p>Disclaimer: No warranty is given in relation to the data (including accuracy, reliability, completeness, currency or suitability) and no liability is accepted (including without limitation, liability in negligence) for any loss, damage or costs (including consequential damage) relating to any use of the data. Data must not be used for direct marketing or be used in breach of the privacy laws.</p>			
	<p>File: File: 2171-ChisholmAvid-Figs-DTM-210930 Date: 30/09/2021</p>			



3.3. Results

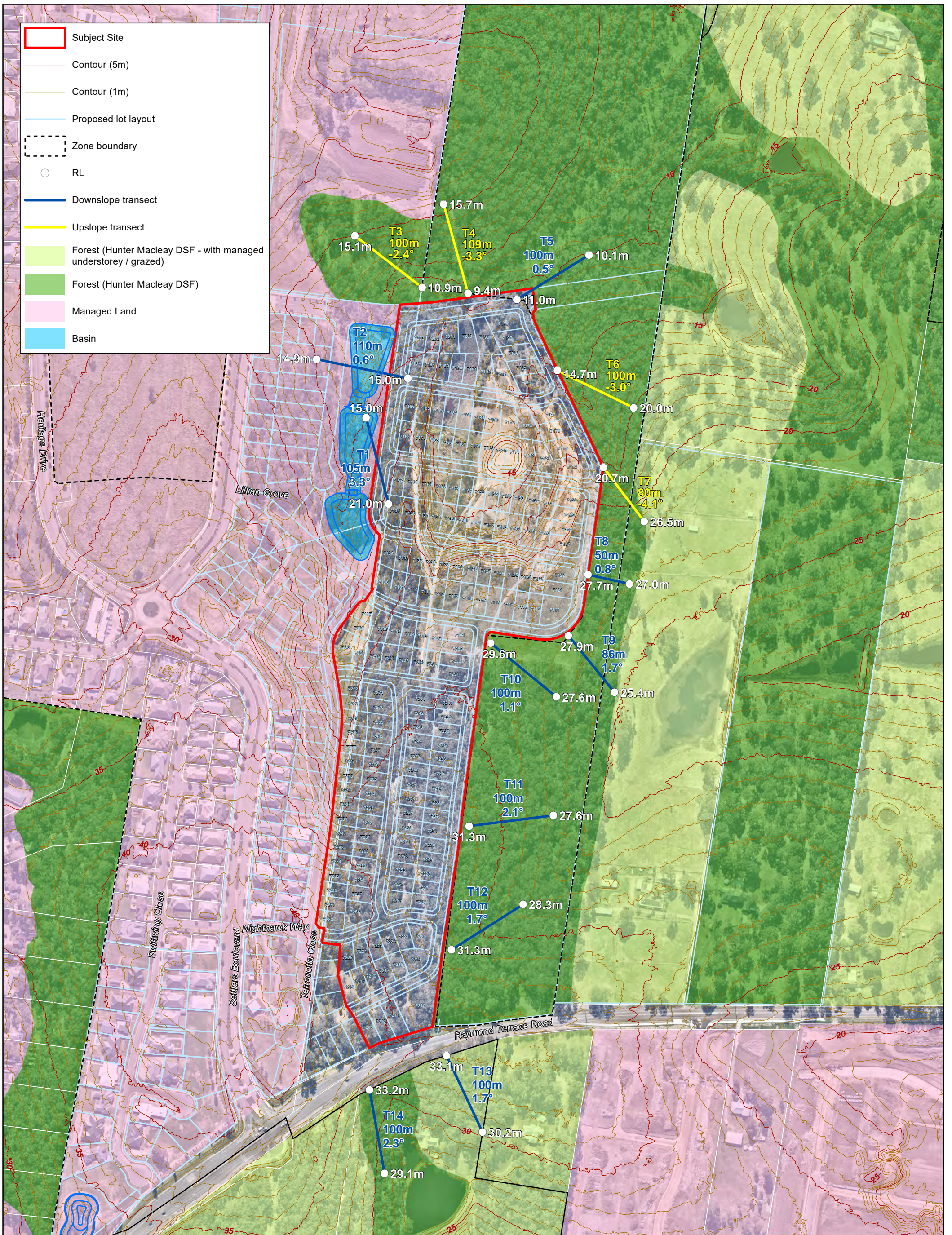
All vegetation identified within the current Bush Fire Prone Land map was confirmed during the site inspection. The results of hazard assessment are detailed in **Table 2** and shown in **Figure 9**.

Overall the primary hazard is confined to the vegetation retained within the residue lot within the development site; equal to the land zoned E2. The vegetation throughout the residue parcel shows evidence of disturbance, but unlike the properties further east, the area of the site not utilised as part of the former quarry operations has not been actively grazed or utilised.

Across the broader landscape, the subject site, specifically the vegetation within the residue lot contains the highest bushfire risk. As the site is generally isolated from larger higher risk bushfire hazards, the hazard is reduced to a medium risk.

Table 2: Slope and Vegetation Assessment Results

Transect	Vegetation Description	Vegetation Classification (PBP 2019)	Slope
T1	Reduced threat vegetation with managed understorey (future residential estate). Stormwater water quality and detention basins – permanently inundated	Low threat vegetation	3.3° Downslope
T2	Reduced threat vegetation with managed understorey (future residential estate). Stormwater water quality and detention basins – permanently inundated	Low threat vegetation	0.6° Downslope
T3	Existing remnant vegetation proposed to be clearing as part of future residential estate and Waste Water Pump Station (WWPS)	Forest (Hunter Macleay DSF)	-2.4° Upslope
T4	Remnant vegetation, grassy forest with some weed infestation and informal pedestrian and bike trails	Forest (Hunter Macleay DSF)	-3.3° Upslope
T5	Remnant vegetation, grassy forest with some weed infestation and informal pedestrian and bike trails	Forest (Hunter Macleay DSF)	0.5° Downslope
T6	Remnant vegetation, open grassy forest	Forest (Hunter Macleay DSF)	-3.0° Upslope
T7	Remnant vegetation, open grassy forest	Forest (Hunter Macleay DSF)	-4.1° Upslope
T8	Remnant vegetation, open grassy forest	Forest (Hunter Macleay DSF)	0.8° Downslope
T9	Remnant vegetation, open grassy forest	Forest (Hunter Macleay DSF)	1.7° Downslope
T10	Remnant vegetation, open grassy forest	Forest (Hunter Macleay DSF)	1.1° Downslope
T11	Remnant vegetation, open grassy forest	Forest (Hunter Macleay DSF)	2.1° Downslope
T12	Remnant vegetation, open grassy forest	Forest (Hunter Macleay DSF)	1.7° Downslope
T13	Remnant vegetation, grassy forest with managed understorey	Forest (Hunter Macleay DSF)	1.7° Downslope
T14	Remnant vegetation within narrow riparian corridor	Forest (Hunter Macleay DSF)	2.3° Downslope



3.4. Significant Environmental Features

The recommended bushfire protection measures have been designed to avoid any unacceptable impacts on a significant environmental feature.

3.5. Threatened Species, populations or ecological communities

The area of the site to be affected by the proposed development has been identified to avoid impact on any threatened species, population or EEC. All bushfire mitigation measures; including APZs will consider the existing and potential biodiversity values to avoid impact where possible

3.6. Aboriginal Objects

A search of the AHIMS database (results contained in **Appendix B**) revealed there are no Aboriginal sites or places recorded near the site.

3.7. Bushfire Planning - Urban Release Area

The subject site is identified within a Bushfire Planning – Urban Release Area (URA) as indicated on **Figure 10** and **11**. As a subdivision of land within an URA, the assessment undertaken as part of the preparation of the BMP may exempt the proposed lots from reassessment of bushfire matters when future land owners are ready to construct a dwelling on their lot/s. For the future landowners to benefit from the available exemptions, a Post-Subdivision Bush Fire Attack Level Certificate (PSBC) must be obtained to allow for the streamlined process. To facilitate the PSBC, a Subdivision BAL Plan is required that demonstrates the location of APZs and that all new lots can suitably accommodate a dwelling envelope achieving BAL-29 or less.

A **Subdivision BAL Plan** has been prepared and contained in **Appendix E**. As part of the application for a BFSa it is requested the RFS endorse the included **Subdivision BAL Plan**.

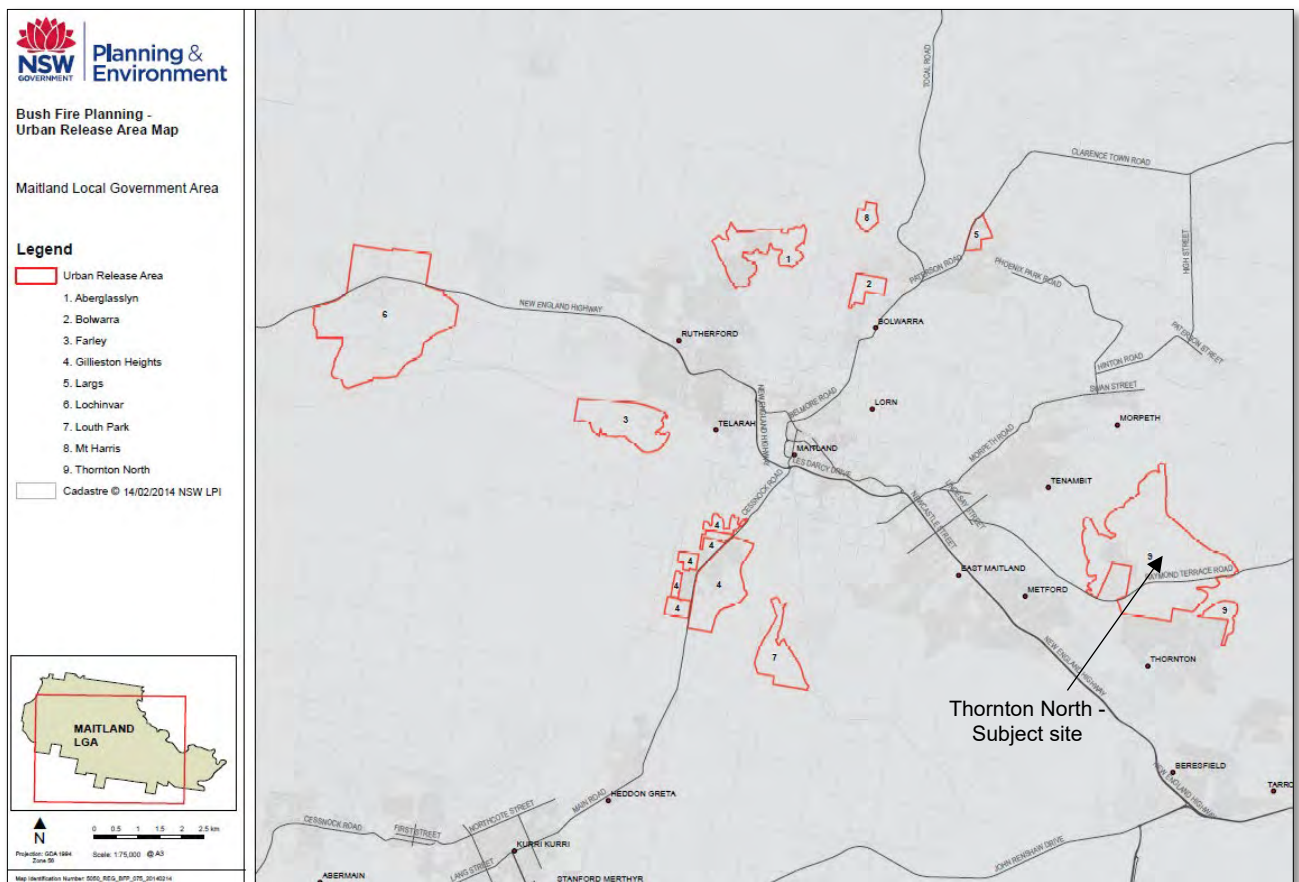


Figure 10: Bushfire Planning – Urban Release Area Map (Maitland LGA)

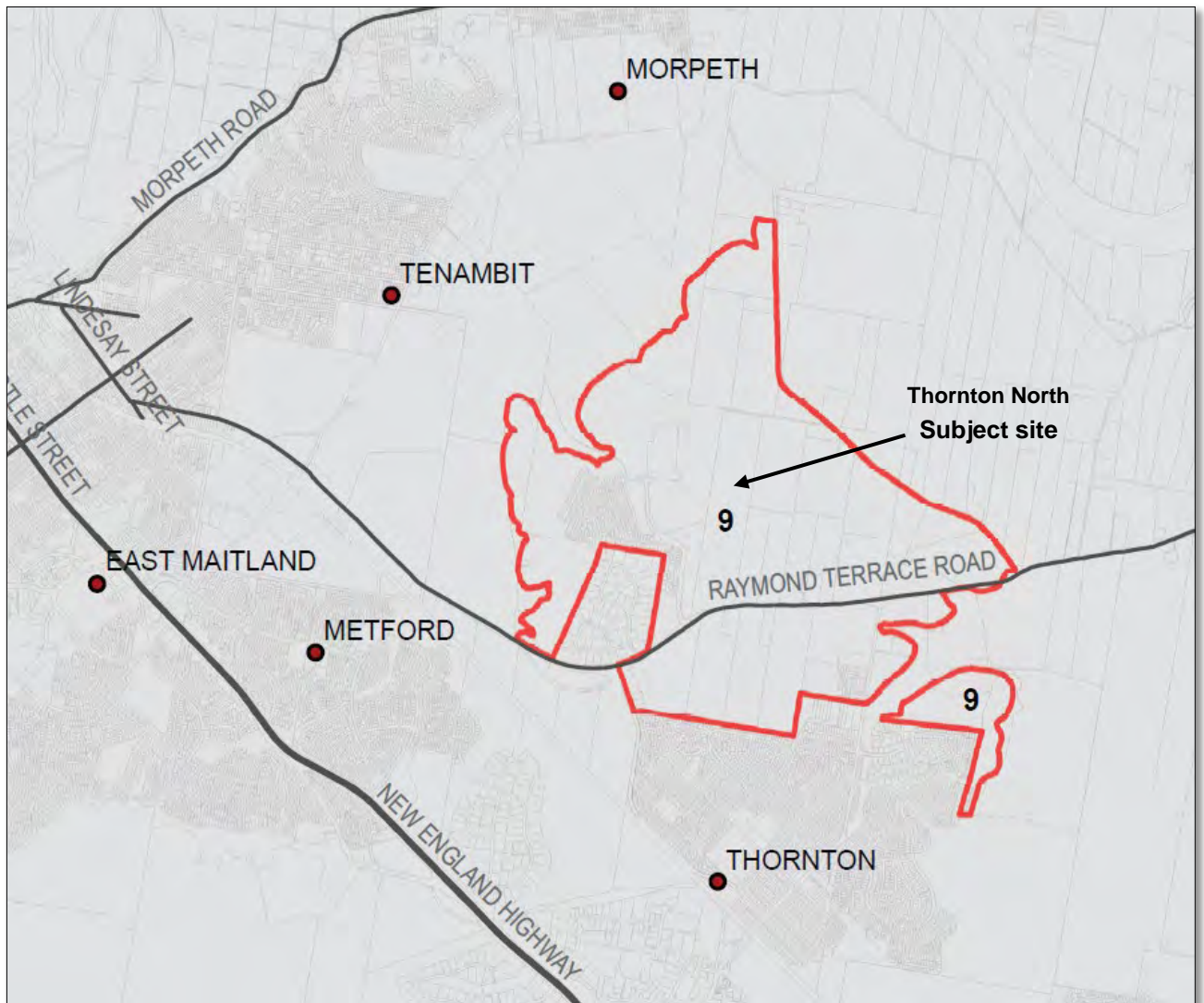


Figure 11: Bushfire Planning – Urban Release Area: Thornton North

4. Bushfire Risk and Mitigation

4.1. Asset Protection Zones

An APZ is an area surrounding a development that is managed to reduce the bushfire hazard to an acceptable level to mitigate the risk to life and property. The required width of the APZ varies with slope and the type of hazard. An APZ can consist of both an inner protection area (IPA) and an outer protection area (OPA). In this instance the entire APZ and the balance of the development site shall be managed as an IPA.

4.1.1. Determining the Appropriate Setbacks

To achieve compliance with the performance criteria for APZs (Table 5.3a), the Acceptable Solutions outlined in Table A1.12.2 of PBP 2019 may be adopted as a deemed-to-satisfy solution.

Alternatively, the appropriate APZ setback may be determined to achieve the Performance Criteria by adopting a performance-based solution. Based on the unique site characteristics identified by the BAR, the intensity of a bushfire event presented as the radiant heat exposure was calculated at several locations throughout the development site using the NBC Bushfire Attack Assessor V4.1. The nominated fuel loads for the respective vegetation classifications as published by the RFS in March 2019 have been used to determine the APZs and the effective slope obtained from the Digital Elevation Model (DEM) for each transect.

As the site lies within the Maitland City Council LGA, it is assessed under a FDI rating of 100. The Detailed Method (Method 2) outlined in Australian Standard *AS3959-2018 Construction of buildings in bushfire prone areas* was used to calculate the potential level of radiant heat flux generated at the nominated locations (see transects T1-T14). To ensure the APZs achieve the intent of Section 5.3.1 of PBP 2019, the APZs have been determined to ensure all lots are able to accommodate a dwelling that will not be exposed to radiant heat levels exceeding 29kW/m². The NBC Bushfire Attack Assessor report detailing the inputs used is contained in **Appendix C**.

Refer to **Table 3** for the recommended APZs. **Figure 13** indicates the required APZs for the proposed development following the successful development of the adjoining properties.

Table 3: Required and Recommended Asset Protection Zones

Transect	Vegetation Classification (PBP 2019)	Slope Class	PBP 2019	Recommended APZ
			FDI 100 Table A1.12.2	(29kW/m ²) Method 2
T1	Low threat vegetation	3.3° Downslope	0m	0m
T2	Low threat vegetation	0.6° Downslope	0m	0m
T3	Forest (Hunter Macleay DSF)	-2.4° Upslope	24m	14m
T4	Forest (Hunter Macleay DSF)	-3.3° Upslope	24m	14m
T5	Forest (Hunter Macleay DSF)	0.5° Downslope	29m	17m
T6	Forest (Hunter Macleay DSF)	-3.0° Upslope	24m	14m
T7	Forest (Hunter Macleay DSF)	-4.1° Upslope	24m	12m

Transect	Vegetation Classification (PBP 2019)	Slope Class	PBP 2019 FDI 100 Table A1.12.2	Recommended APZ (29kW/m ²) Method 2
T8	<i>Forest (Hunter Macleay DSF)</i>	0.8° Downslope	29m	17m
T9	<i>Forest (Hunter Macleay DSF)</i>	1.7° Downslope	29m	17m
T10	<i>Forest (Hunter Macleay DSF)</i>	1.1° Downslope	29m	17m
T11	<i>Forest (Hunter Macleay DSF)</i>	2.1° Downslope	29m	18m
T12	<i>Forest (Hunter Macleay DSF)</i>	1.7° Downslope	29m	18m
T13	<i>Forest (Hunter Macleay DSF)</i>	1.7° Downslope	29m	18m
T14	<i>Forest (Hunter Macleay DSF)</i>	2.3° Downslope	29m	18m

4.2. Landscaping and Vegetation Management

In APZs and IPAs, the design and management of the landscaped areas in the vicinity of buildings have the potential to improve the chances of survival of people and buildings. Reduction of fuel does not require the removal of all vegetation. Trees and plants can provide some bushfire protection from strong winds, intense heat and flying embers (by filtering embers) and changing wind patterns.

Generally landscaping in and around a bushfire hazard should consider the following:

- Priority given to retaining species that have a low flammability;
- Priority given to retaining species which do not drop much litter in the bushfire season and which do not drop litter that persists as ground fuel in the bush fire season;
- Priority given to retaining smooth barked species over stringy bark; and
- Create discontinuous or gaps in the vegetation to slow down or break the progress of fire towards the dwellings.

Landscaping within APZs and IPAs should give due regard to fire retardant plants and ensure that fuel loads do not accumulate as a result of the selected plant varieties.

The principles of landscaping for bushfire protection aim to:

- Prevent flame impingement on dwellings;
- Provide a defensible space for property protection;
- Reduce fire spread;
- Deflect and filter embers;
- Provide shelter from radiant heat; and
- Reduce wind speed.

Avoiding understorey planting and regular trimming of the lower limbs of trees also assists in reducing fire penetration into the canopy. Rainforests species such as *Syzygium* and figs are preferred to species with high fine fuel and/or oil content.

Trees with loose, fibrous or stringy bark should be avoided. These trees can easily ignite and encourage ground fire to spread up to, and then through the crown of trees.

Consideration should be given to vegetation fuel loads present on site with particular attention to APZs.

Careful thought must be given to the type and physical location of any proposed site landscaping. Inappropriately selected and positioned vegetation has the potential to 'replace' any previously removed fuel load.

Bearing in mind the desired aesthetic and environment sought by site landscaping, some basic principles have been recommended to help minimise the chance of such works contributing to the potential hazard on site.

Specific requirements for the management of vegetation and landscaping around vulnerable developments and within the APZ the following conditions apply:

- Within 10m of a building, flammable objects such as plants, mulches and fences must not be located close to vulnerable parts of the building such as windows, decks and eaves;
- Trees must not overhang the roofline of the building, touch walls or any other elements of a building;
- Grass should be no more than 100mm in height. All leaves and vegetation debris are to be removed at regular intervals (rake leaves and twigs from grass every week during the fire season);

- Establish lawn substitutes including non-flammable ground covers such as decorative stone or gravel;
- Plants greater than 100m in height at maturity must not be placed directly in front of a window or other glass features;
- Tree canopy separation of 2 metres and overall canopy cover no more than 15% at maturity;
- Preference should be given to smooth barked and evergreen trees;
- Shrubs should not be located under trees;
- Shrubs should not form more than 10% ground cover; and
- Provide a reliable and sufficient water supply and installation of sprinkler systems to create a well-watered landscape.

Whilst it is recognised that fire-retardant plant species are not always the most aesthetically pleasing choice for site landscaping, the need for adequate protection of life and property requires that a suitable balance between visual and safety concerns be considered.

It is reiterated again that it is essential that any landscaped areas and surrounds are subject to ongoing fuel management and reduction to ensure that fine fuels do not build up.

4.3. Access

In the unlikely event of a serious bushfire, it will be essential to ensure that adequate ingress / egress and the provision of defendable space are afforded in the subdivision layout. All dwellings must have direct access to a public road. Section 5.3.2 of PBP 2019 requires a development to provide safe operational access to structures and water supply for emergency services while residents are seeking to evacuate.

Refer to **Appendix A** for the development plans indicating the proposed access arrangements. Four (4) public road connections are proposed to be constructed as an extension to:

- Tigerhawk Drive (west);
- Greenling Drive;
- Regina Way;
- Cora Way; and
- Tigerhawk Drive (east – future DA).

Perimeter roads are provided at every bushland interface and a network of non-perimeter roads provide multiple egress routes for residents to evacuate while emergency services are entering the area.

All roads have been designed in accordance with PBP 2019 including minimum 8m wide road carriageways for all perimeter roads and non-perimeter roads.

In summary, it is considered the proposed road network provides safe, all-weather two-way through roads and safe operational access for emergency service personnel and evacuation purposes; complying with the relevant provisions contained in Section 5.3.2 of PBP.

4.4. Services – water electricity and gas

4.4.1. Water

Fire hydrant spacing, sizing and pressure should comply with AS 2419.1 – 2005. Hydrants are not to be located within any road carriageway.

All sites within the proposed development will be connected to the internal reticulated water supply.

4.4.2. Electricity

All electricity services will be located underground.

4.4.3. Gas

Any reticulated or bottled gas should be installed and maintained according to the requirements of the relevant authorities and AS 1592-2002. It is expected that the location of gas services will not lead to ignition of surrounding bushland or the fabric of buildings.

4.5. Construction Standards: Bushfire Attack Level

All buildings must satisfy the Performance Requirements of the National Construction Code: Building Code of Australia (BCA). Part 2.3 of Volume 2 of the BCA applies to dwellings located within designated bushfire areas, which are defined as:

Land which has been designated under a power in legislation as being subject, or likely to be subject to, bushfires.

Accordingly, all forthcoming habitable buildings must satisfy the requirements of Part 3.7.4 of the BCA. The *Deemed-to-Satisfy* (DTS) provision of the BCA can only be achieved if dwellings in bushfire prone areas are constructed in accordance with Australian Standard *AS3959-2018 Construction of buildings in bushfire prone areas*. Alternatively, the DTS provisions can also be achieved if the habitable building is constructed in accordance with the NASH Standard 'Steel Framed Construction in Bushfire Areas'.

Building design and the materials used for construction of future dwellings should be chosen based on the information contained within AS3959-2018, and accordingly the designer/architect should be made aware of this recommendation.

The determinations of the appropriate bushfire attack level (BAL) is based on the maximum potential radiant heat exposure. BALs are based upon parameters such as weather modelling, fire-line intensity, flame length calculations, as well as vegetation and fuel load analysis. The determination of the BAL is derived by assessing the:

- Relevant FDI = 100;
- Flame temperature = 1090K;
- Slope = variable;
- Vegetation classification = *forest*, and
- Building location.

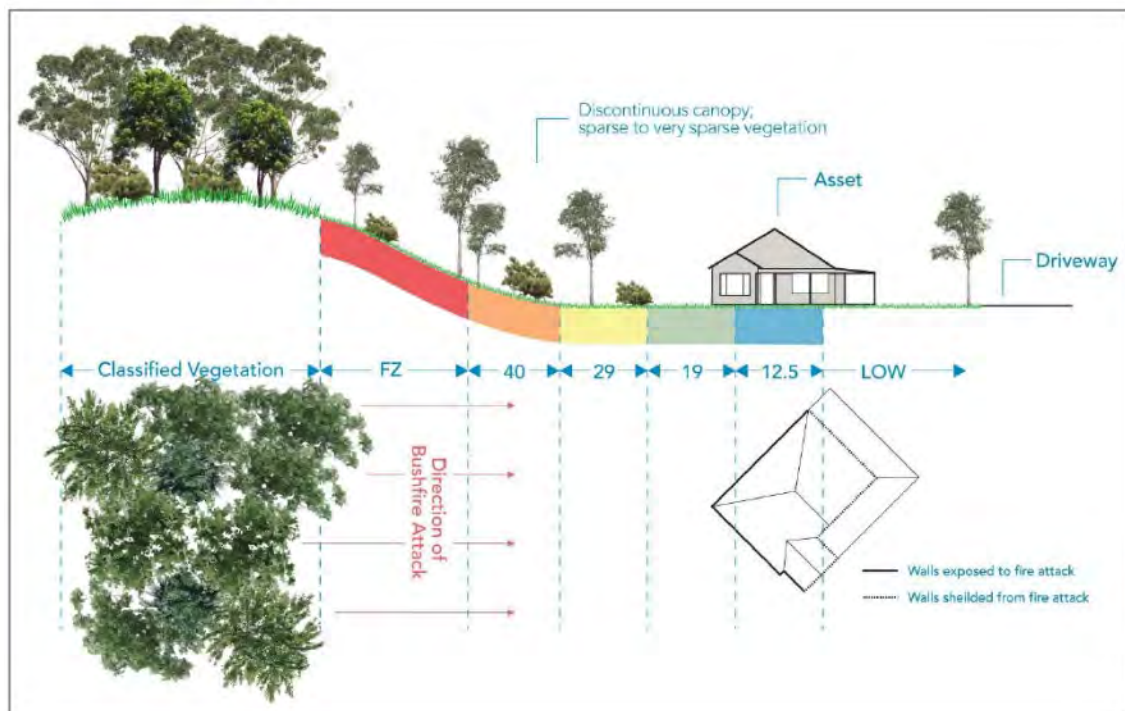


Figure 12: Bushfire Attack Level

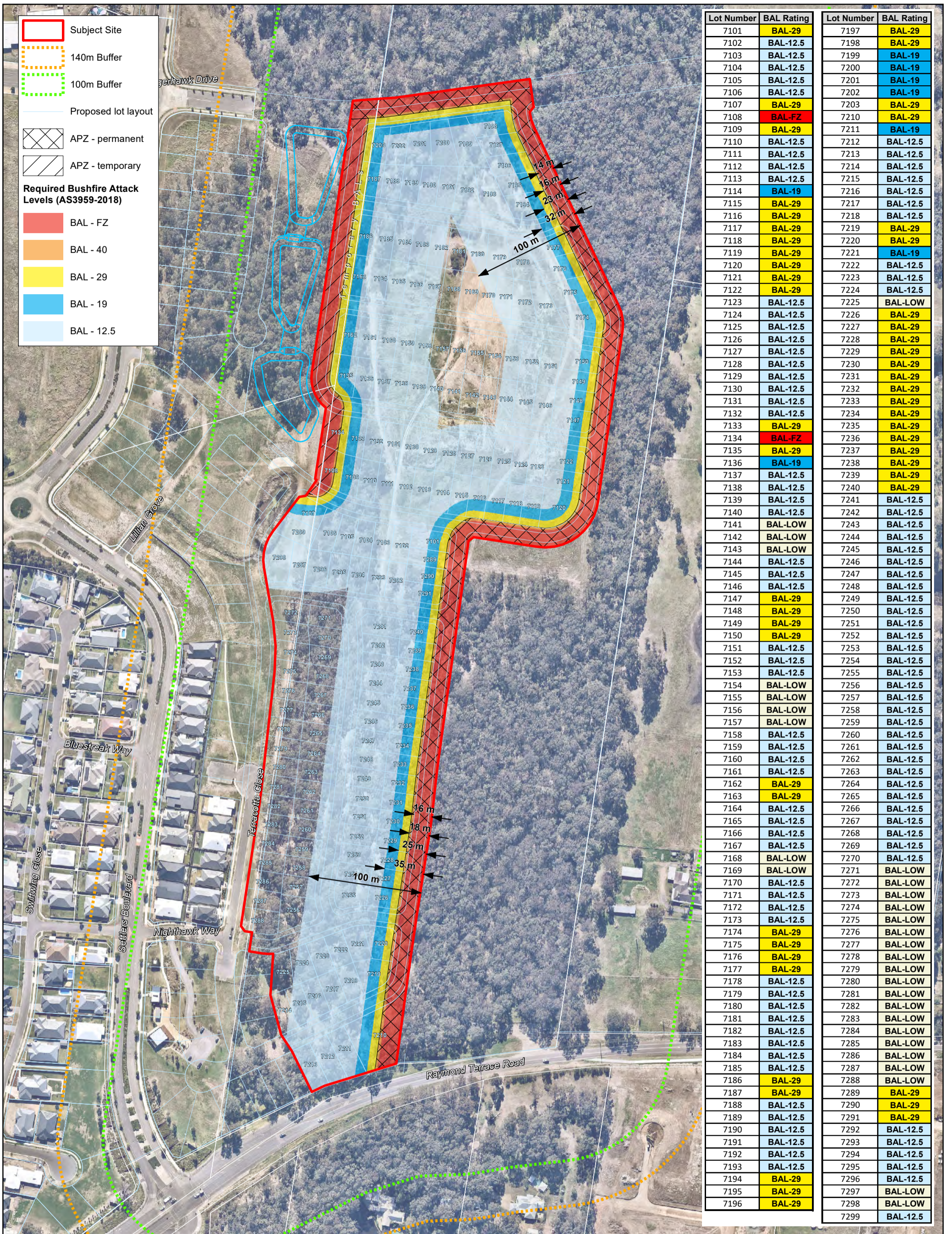
The BALs for each transect have been calculated and provided in **Table 4**.

To demonstrate the BAL ratings, **Figure 13** has been prepared in accordance with the methodology to prepare a **Subdivision BAL Plan** outlined in the RFS User Guide for Subdivision of Urban Release Areas on Bush Fire Prone land to represent the different scenarios.

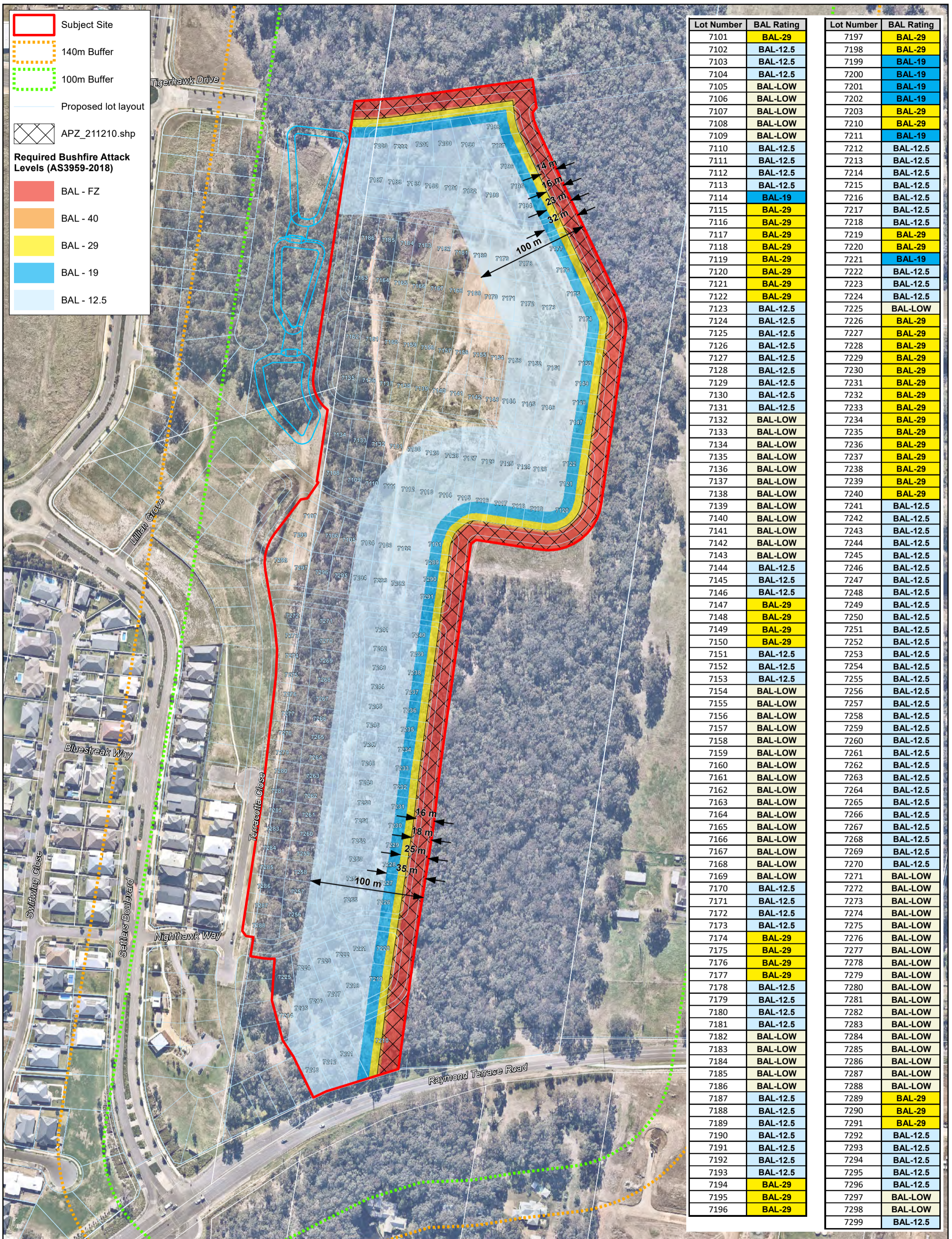
Table 4: Required BALS (PBP 2019)

Transect	Vegetation Classification (PBP 2019)	Slope	APZ (29kW/m ²)	Distance from Hazard	Bushfire Attack Level (BAL)
T1 & T2	Low threat vegetation	4.0° Downslope	0m	N/A	BAL-LOW
T3 & T4	Forest (Hunter Macleay DSF)	-2.0° Upslope	14m	0m-<13m	BAL-FZ
				13m-<14m	BAL-40
				14m-<21m	BAL-29
				21m-<29m	BAL-19
				29m-<100m	BAL-12.5
T5	Forest (Hunter Macleay DSF)	1.0° Downslope	17m	0m-<15m	BAL-FZ
				15m-<17m	BAL-40
				17m-<24m	BAL-29
				24m-<34m	BAL-19
				34m-<100m	BAL-12.5
T6	Forest (Hunter Macleay DSF)	-3.0° Upslope	14m	0m-<12m	BAL-FZ
				12m-<14m	BAL-40
				14m-<20m	BAL-29
				20m-<28m	BAL-19
				28m-<100m	BAL-12.5
T7	Forest (Hunter Macleay DSF)	-4.1° Upslope	12m	0m-<12m	BAL-FZ
				12m-<13m	BAL-40
				13m-<19m	BAL-29
				19m-<27m	BAL-19
				27m-<100m	BAL-12.5
T8, T9 & T10	Forest (Hunter Macleay DSF)	1.7° Downslope	17m	0m-<16m	BAL-FZ
				16m-<17m	BAL-40
				17m-<25m	BAL-29
				25m-<35m	BAL-19
				35m-<100m	BAL-12.5
T11 & T12	Forest (Hunter Macleay DSF)	2.1° Downslope	18m	0m-<16m	BAL-FZ
				16m-<18m	BAL-40
				18m-<25m	BAL-29
				25m-<35m	BAL-19
				35m-<100m	BAL-12.5

Transect	Vegetation Classification (PBP 2019)	Slope	APZ (29kW/m ²)	Distance from Hazard	Bushfire Attack Level (BAL)
T13 & T14	<i>Forest (Hunter Macleay DSF)</i>	2.3° Downslope	18m	0m-<16m	BAL-FZ
				16m-<18m	BAL-40
				18m-<25m	BAL-29
				25m-<35m	BAL-19
				35m-<100m	BAL-12.5



Lot Number	BAL Rating	Lot Number	BAL Rating
7101	BAL-29	7197	BAL-29
7102	BAL-12.5	7198	BAL-29
7103	BAL-12.5	7199	BAL-19
7104	BAL-12.5	7200	BAL-19
7105	BAL-12.5	7201	BAL-19
7106	BAL-12.5	7202	BAL-19
7107	BAL-29	7203	BAL-29
7108	BAL-FZ	7210	BAL-29
7109	BAL-29	7211	BAL-19
7110	BAL-12.5	7212	BAL-12.5
7111	BAL-12.5	7213	BAL-12.5
7112	BAL-12.5	7214	BAL-12.5
7113	BAL-12.5	7215	BAL-12.5
7114	BAL-19	7216	BAL-12.5
7115	BAL-29	7217	BAL-12.5
7116	BAL-29	7218	BAL-12.5
7117	BAL-29	7219	BAL-29
7118	BAL-29	7220	BAL-29
7119	BAL-29	7221	BAL-19
7120	BAL-29	7222	BAL-12.5
7121	BAL-29	7223	BAL-12.5
7122	BAL-29	7224	BAL-12.5
7123	BAL-12.5	7225	BAL-LOW
7124	BAL-12.5	7226	BAL-29
7125	BAL-12.5	7227	BAL-29
7126	BAL-12.5	7228	BAL-29
7127	BAL-12.5	7229	BAL-29
7128	BAL-12.5	7230	BAL-29
7129	BAL-12.5	7231	BAL-29
7130	BAL-12.5	7232	BAL-29
7131	BAL-12.5	7233	BAL-29
7132	BAL-12.5	7234	BAL-29
7133	BAL-29	7235	BAL-29
7134	BAL-FZ	7236	BAL-29
7135	BAL-29	7237	BAL-29
7136	BAL-19	7238	BAL-29
7137	BAL-12.5	7239	BAL-29
7138	BAL-12.5	7240	BAL-29
7139	BAL-12.5	7241	BAL-12.5
7140	BAL-12.5	7242	BAL-12.5
7141	BAL-LOW	7243	BAL-12.5
7142	BAL-LOW	7244	BAL-12.5
7143	BAL-LOW	7245	BAL-12.5
7144	BAL-12.5	7246	BAL-12.5
7145	BAL-12.5	7247	BAL-12.5
7146	BAL-12.5	7248	BAL-12.5
7147	BAL-29	7249	BAL-12.5
7148	BAL-29	7250	BAL-12.5
7149	BAL-29	7251	BAL-12.5
7150	BAL-29	7252	BAL-12.5
7151	BAL-12.5	7253	BAL-12.5
7152	BAL-12.5	7254	BAL-12.5
7153	BAL-12.5	7255	BAL-12.5
7154	BAL-LOW	7256	BAL-12.5
7155	BAL-LOW	7257	BAL-12.5
7156	BAL-LOW	7258	BAL-12.5
7157	BAL-LOW	7259	BAL-12.5
7158	BAL-12.5	7260	BAL-12.5
7159	BAL-12.5	7261	BAL-12.5
7160	BAL-12.5	7262	BAL-12.5
7161	BAL-12.5	7263	BAL-12.5
7162	BAL-29	7264	BAL-12.5
7163	BAL-29	7265	BAL-12.5
7164	BAL-12.5	7266	BAL-12.5
7165	BAL-12.5	7267	BAL-12.5
7166	BAL-12.5	7268	BAL-12.5
7167	BAL-12.5	7269	BAL-12.5
7168	BAL-LOW	7270	BAL-12.5
7169	BAL-LOW	7271	BAL-LOW
7170	BAL-12.5	7272	BAL-LOW
7171	BAL-12.5	7273	BAL-LOW
7172	BAL-12.5	7274	BAL-LOW
7173	BAL-12.5	7275	BAL-LOW
7174	BAL-29	7276	BAL-LOW
7175	BAL-29	7277	BAL-LOW
7176	BAL-29	7278	BAL-LOW
7177	BAL-29	7279	BAL-LOW
7178	BAL-12.5	7280	BAL-LOW
7179	BAL-12.5	7281	BAL-LOW
7180	BAL-12.5	7282	BAL-LOW
7181	BAL-12.5	7283	BAL-LOW
7182	BAL-12.5	7284	BAL-LOW
7183	BAL-12.5	7285	BAL-LOW
7184	BAL-12.5	7286	BAL-LOW
7185	BAL-12.5	7287	BAL-LOW
7186	BAL-29	7288	BAL-LOW
7187	BAL-29	7289	BAL-29
7188	BAL-12.5	7290	BAL-29
7189	BAL-12.5	7291	BAL-29
7190	BAL-12.5	7292	BAL-12.5
7191	BAL-12.5	7293	BAL-12.5
7192	BAL-12.5	7294	BAL-12.5
7193	BAL-12.5	7295	BAL-12.5
7194	BAL-29	7296	BAL-12.5
7195	BAL-29	7297	BAL-LOW
7196	BAL-29	7298	BAL-LOW
		7299	BAL-12.5



Lot Number	BAL Rating
7101	BAL-29
7102	BAL-12.5
7103	BAL-12.5
7104	BAL-12.5
7105	BAL-LOW
7106	BAL-LOW
7107	BAL-LOW
7108	BAL-LOW
7109	BAL-LOW
7110	BAL-12.5
7111	BAL-12.5
7112	BAL-12.5
7113	BAL-12.5
7114	BAL-19
7115	BAL-29
7116	BAL-29
7117	BAL-29
7118	BAL-29
7119	BAL-29
7120	BAL-29
7121	BAL-29
7122	BAL-29
7123	BAL-12.5
7124	BAL-12.5
7125	BAL-12.5
7126	BAL-12.5
7127	BAL-12.5
7128	BAL-12.5
7129	BAL-12.5
7130	BAL-12.5
7131	BAL-12.5
7132	BAL-LOW
7133	BAL-LOW
7134	BAL-LOW
7135	BAL-LOW
7136	BAL-LOW
7137	BAL-LOW
7138	BAL-LOW
7139	BAL-LOW
7140	BAL-LOW
7141	BAL-LOW
7142	BAL-LOW
7143	BAL-LOW
7144	BAL-12.5
7145	BAL-12.5
7146	BAL-12.5
7147	BAL-29
7148	BAL-29
7149	BAL-29
7150	BAL-29
7151	BAL-12.5
7152	BAL-12.5
7153	BAL-12.5
7154	BAL-LOW
7155	BAL-LOW
7156	BAL-LOW
7157	BAL-LOW
7158	BAL-LOW
7159	BAL-LOW
7160	BAL-LOW
7161	BAL-LOW
7162	BAL-LOW
7163	BAL-LOW
7164	BAL-LOW
7165	BAL-LOW
7166	BAL-LOW
7167	BAL-LOW
7168	BAL-LOW
7169	BAL-LOW
7170	BAL-12.5
7171	BAL-12.5
7172	BAL-12.5
7173	BAL-12.5
7174	BAL-29
7175	BAL-29
7176	BAL-29
7177	BAL-29
7178	BAL-12.5
7179	BAL-12.5
7180	BAL-12.5
7181	BAL-12.5
7182	BAL-LOW
7183	BAL-LOW
7184	BAL-LOW
7185	BAL-LOW
7186	BAL-LOW
7187	BAL-12.5
7188	BAL-12.5
7189	BAL-12.5
7190	BAL-12.5
7191	BAL-12.5
7192	BAL-12.5
7193	BAL-12.5
7194	BAL-29
7195	BAL-29
7196	BAL-29

Lot Number	BAL Rating
7197	BAL-29
7198	BAL-29
7199	BAL-19
7200	BAL-19
7201	BAL-19
7202	BAL-19
7203	BAL-29
7210	BAL-29
7211	BAL-19
7212	BAL-12.5
7213	BAL-12.5
7214	BAL-12.5
7215	BAL-12.5
7216	BAL-12.5
7217	BAL-12.5
7218	BAL-12.5
7219	BAL-29
7220	BAL-29
7221	BAL-19
7222	BAL-12.5
7223	BAL-12.5
7224	BAL-12.5
7225	BAL-LOW
7226	BAL-29
7227	BAL-29
7228	BAL-29
7229	BAL-29
7230	BAL-29
7231	BAL-29
7232	BAL-29
7233	BAL-29
7234	BAL-29
7235	BAL-29
7236	BAL-29
7237	BAL-29
7238	BAL-29
7239	BAL-29
7240	BAL-29
7241	BAL-12.5
7242	BAL-12.5
7243	BAL-12.5
7244	BAL-12.5
7245	BAL-12.5
7246	BAL-12.5
7247	BAL-12.5
7248	BAL-12.5
7249	BAL-12.5
7250	BAL-12.5
7251	BAL-12.5
7252	BAL-12.5
7253	BAL-12.5
7254	BAL-12.5
7255	BAL-12.5
7256	BAL-12.5
7257	BAL-12.5
7258	BAL-12.5
7259	BAL-12.5
7260	BAL-12.5
7261	BAL-12.5
7262	BAL-12.5
7263	BAL-12.5
7264	BAL-12.5
7265	BAL-12.5
7266	BAL-12.5
7267	BAL-12.5
7268	BAL-12.5
7269	BAL-12.5
7270	BAL-12.5
7271	BAL-LOW
7272	BAL-LOW
7273	BAL-LOW
7274	BAL-LOW
7275	BAL-LOW
7276	BAL-LOW
7277	BAL-LOW
7278	BAL-LOW
7279	BAL-LOW
7280	BAL-LOW
7281	BAL-LOW
7282	BAL-LOW
7283	BAL-LOW
7284	BAL-LOW
7285	BAL-LOW
7286	BAL-LOW
7287	BAL-LOW
7288	BAL-LOW
7289	BAL-29
7290	BAL-29
7291	BAL-29
7292	BAL-12.5
7293	BAL-12.5
7294	BAL-12.5
7295	BAL-12.5
7296	BAL-12.5
7297	BAL-LOW
7298	BAL-LOW
7299	BAL-12.5

4.6. Emergency Services

There is a NSW Fire & Rescue Station located at 110 Mount Vincent Road in East Maitland, approximately 9.1km or 13 minutes drive away from the site. Fire suppression would be undertaken by local NSW RFS brigades, supported by NSW Fire & Rescue. The nearest NSW RFS Brigade is located at Kooralbyn Street, Thornton, approximately 4.5km (6 minutes) drive from the site.

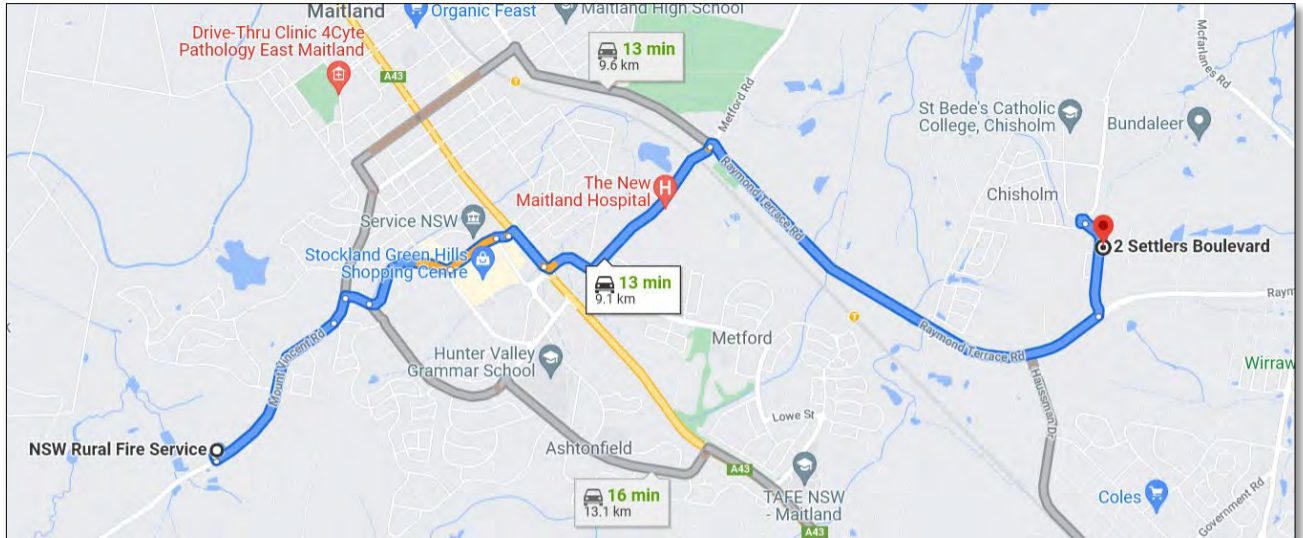


Figure 14: NSW Fire & Rescue - East Maitland

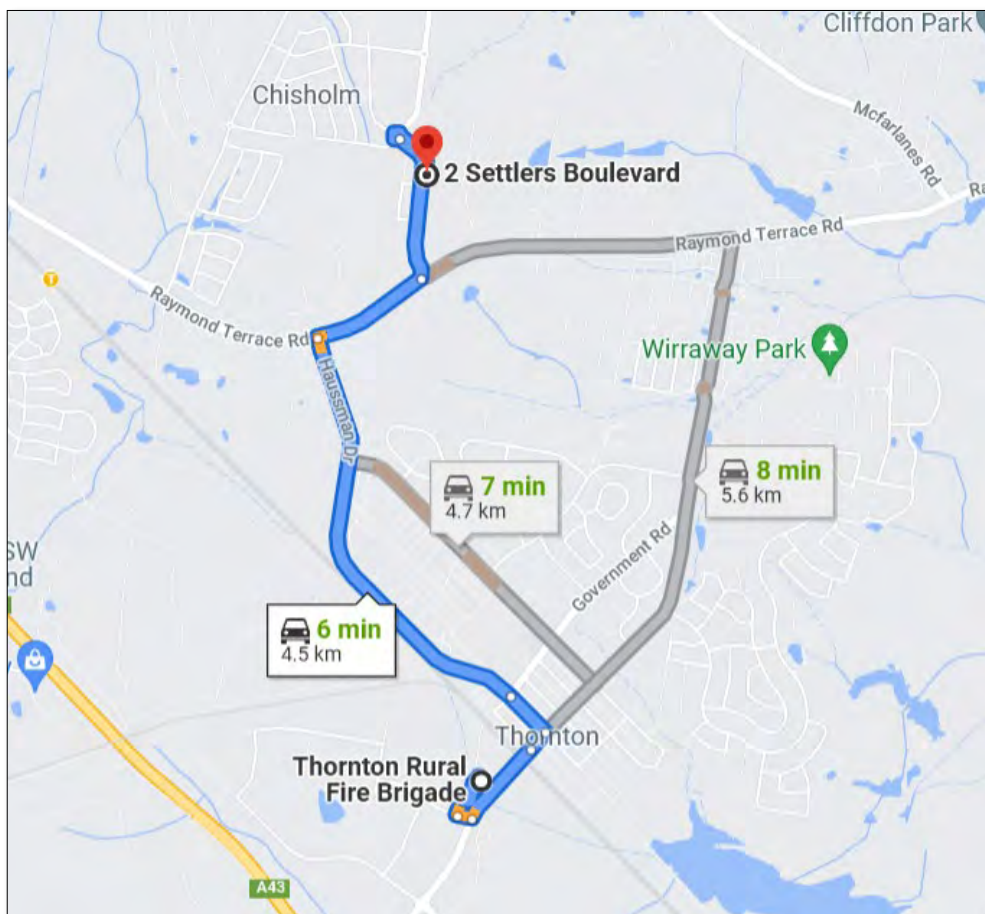


Figure 15: NSW Rural Fire Brigade - Thornton

5. Conclusion and Recommendations

Bushfire Planning Australia has been engaged by Avid Residential Estate Pty Ltd to undertake a Bushfire Assessment Report (BAR) for the proposed subdivision of 487 Raymond Terrace Road and 2 Settlers Boulevard, Chisholm to create 193 residential lots.

This BAR found the site is currently exposed to a medium bushfire hazard to the east of the site and will be exposed to a high bushfire hazard created by the vegetation to be retained within the residue parcel. The hazardous vegetation is primarily a grassy forest across gradual slopes. The primary bushfire hazard is generally confined to the site, specifically the residue parcel and is not connected to any continuous areas of vegetation. Across the broader landscape the development site is centrally located within a major urban growth precinct and surrounded by recently constructed housing estates, or land where development consent is being obtained for future residential development. Beyond the urban growth precinct the landscape transitions to the north down to the floodplains of the Hunter River which are currently used for open grazing.

The BAR concludes the bushfire hazard can be successfully mitigated by applying the requirements of PBP 2019, along with some additional measures which will be implemented as an interim measure until the development of adjoining lands that will result in removal of the majority of the bushfire hazard. As the predominant vegetation class is a type of grassy forest, a Performance based solution has been designed to allow for the site specific characteristics; specifically the fuel load associated with a grassy forest.

Furthermore, as part of the application for a Bush Fire Safety Authority, we are also seeking endorsement of the Subdivision BAL Plan contained in **Appendix E**.

In summary, the following key recommendations have been designed to enable the proposed residential development to achieve the aims and objectives of PBP 2019:

1. The entire site shall be managed as an Inner Protection Area (IPA) as outlined within Appendix 4 of PBP 2019 and the RFS document Standards for asset protection zones;
2. The APZs shown in **Figure 13 – Subdivision BAL Plan** shall be maintained in perpetuity in accordance with the requirements of Appendix 4 of PBP 2019;
3. Access shall be provided in accordance with Table 5.3b of PBP 2019. This will require the provision of a minimum of two (2) separate road access points provided from the development site to the west to ensure safe evacuation for all residents;
4. All temporary turning heads shall be constructed in accordance Appendix A3.3 of PBP 2019;
5. Vegetation within road verges (including swales) to be consistent with a grassland vegetation classification with tree canopy less than 10% at maturity (and considered unmanaged);
6. The Bushfire Attack Level (BAL) ratings identified in **Figure 13 – Subdivision BAL Plan** apply to all future dwellings to be constructed on the proposed lots. All future dwellings to be constructed on the proposed lots shall have due regard to the specific considerations given in the National Construction Code: Building Code of Australia (BCA) which makes specific reference to Australian Standard AS3959-2018 Construction of buildings in bushfire prone areas (AS3959-2018) and the NASH Standard Steel Framed Construction in Bushfire Prone Areas;
7. All new lots are to be connected to a reliable water supply network and that suitable fire hydrants are located throughout the development site that are clearly marked and provided for the purposes of bushfire protection. Fire hydrant spacing, sizing and pressure shall comply with AS2419.1 2005 and section 5.3.3 of PBP 2019; and
8. Consideration should be given to landscaping and fuel loads on site to decrease potential fire hazards on site.

This assessment has been made based on the bushfire hazards observed in and around the site at the time of inspection and production (December 2021) and demonstrates the development has satisfied the aims and objectives of Planning for Bushfire Protection 2019.

Finally, should the above recommendations be implemented, the existing bushfire risk should be suitably mitigated to offer an acceptable level of protection to life and property for those persons and assets occupying the site but they do not and cannot guarantee that the area will not be affected by bushfire at some time and that property and life damage/loss will not occur.

6. References

- ❑ NSW Rural Fire Service (2005). *Standards for Asset Protection Zones*. NSW Rural Fire Service.
- ❑ NSW Rural Fire Service (2019). *Planning for Bushfire Protection – A Guide for Councils, Planners, Fire Authorities, Developers and Home Owners*.
- ❑ Ramsay, GC and Dawkins, D (1993). *Building in Bushfire-prone Areas – Information and Advice*. CSIRO and Standards Australia.
- ❑ Rural Fires and Environmental Assessment Legislation Amendment Act 2002.
- ❑ Standards Australia (2018). AS 3959 – 2018: Construction of Buildings in Bushfire-prone Areas.

Appendix A: Plan of Proposed Residential Subdivision



LEGEND	
	SITE CADASTRAL BOUNDARY
	PROPOSED DEVELOPMENT APPLICATION
	EXISTING BOUNDARY
	FUTURE BOUNDARY (APPROVED)
	PROPOSED BOUNDARY

ver.	date	comment	drawn	pm	level information	scale (A1 original size)	notes
A	08.12.21	INITIAL ISSUE	MF	MK	DATUM: AHD CONTOUR INTERVAL: 1.0m	A1 1:3000 A3 1:8000	NOTE: PLANS ARE PREPARED IN COLOUR

drawing title:
EXISTING SITE NATURAL SURFACE PLAN

location: CHISHOLM

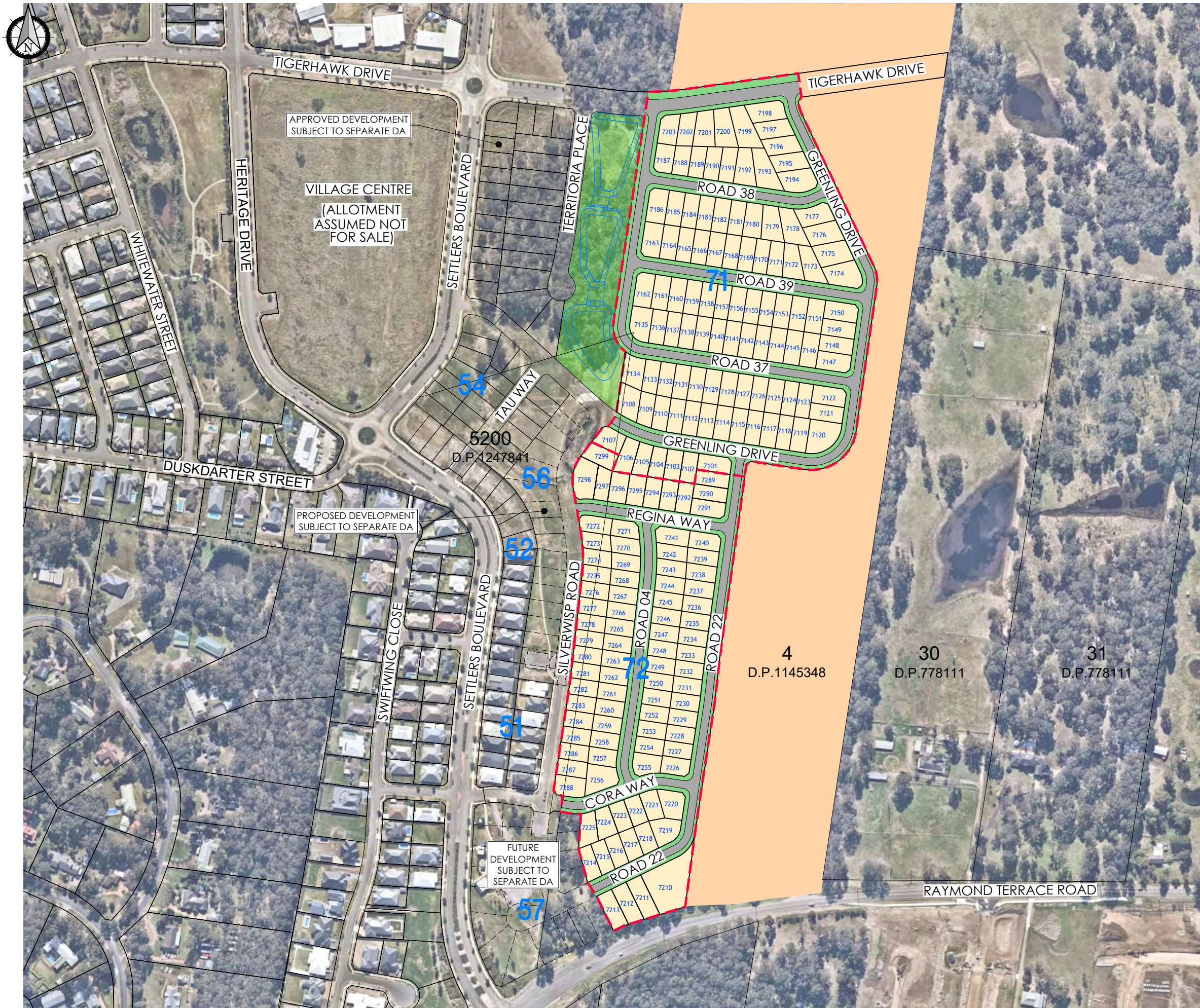
council: MAITLAND CITY COUNCIL

dwg ref: 190433(71-72)-DA-104

client:
AVID Property Group
 adw johnson

central coast office ph: (02) 4305 4300
 hunter office ph: (02) 4978 5100
 sydney office ph: (02) 8046 7411

www.adwjohanson.com.au



LEGEND

- SITE CADASTRAL BOUNDARY
- PROPOSED DEVELOPMENT APPLICATION
- EXISTING BOUNDARY
- FUTURE BOUNDARY (APPROVED)
- PROPOSED BOUNDARY
- 31** STAGE NUMBER
- PROPOSED LOTS
- RESIDUE LOT

TABLE

STAGE 71	103 LOTS
STAGE 72	90 LOTS
TOTAL	193 LOTS

drawing title:
OVERALL MASTERPLAN

location: CHISHOLM

council: MAITLAND CITY COUNCIL

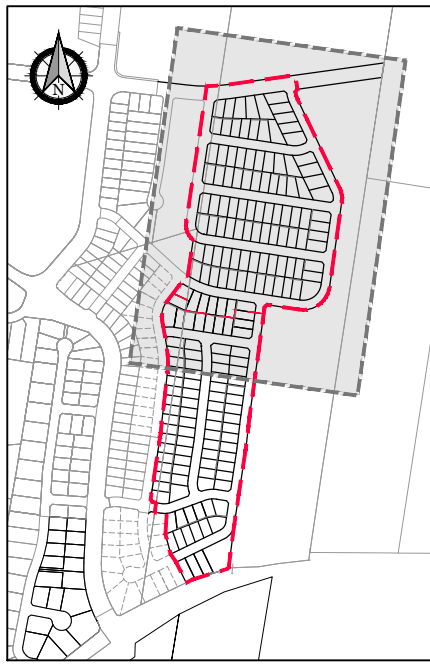
dwg ref: 190433(71-72)-DA-105

client:
AVID Property Group **adw johnson**

central coast office ph: (02) 4305 4300
 hunter office ph: (02) 4978 5100
 sydney office ph: (02) 8046 7411

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ver.	date	comment	drawn	pm	level information	scale (A1 original size)	notes
A	08.12.21	INITIAL ISSUE	MF	MK	DATUM: AHD CONTOUR INTERVAL: N/A	A1 1:2000 A3 1:4000	NOTE : PLANS ARE PREPARED IN COLOUR



LEGEND

- SITE CADASTRAL BOUNDARY
- PROPOSED DEVELOPMENT APPLICATION
- EXISTING BOUNDARY
- FUTURE BOUNDARY (APPROVED)
- PROPOSED BOUNDARY
- 31 STAGE NUMBER
- PROPOSED LOTS
- RESIDUE LOT

4
D.P.1145348



REFER TO SHEET DA-107

drawing title:
**DETAIL PLAN
STAGE 71**

location: CHISHOLM

council: MAITLAND CITY COUNCIL

dwg ref: 190433(71-72)-DA-106

client:



central coast office ph: (02) 4305 4300
hunter office ph: (02) 4978 5100
sydney office ph: (02) 8046 7411
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Plot Date: 09/12/21 6:35:36AM Cod File: S:\190433\DRAWINGS\PLANNING\STAGE 71 72 DA SET\190433(71-72)-DA-106.DWG
This plan includes coloured information. If you have a black and white copy you do not have all of the information. This note is coloured RED.

ver.	date	comment	drawn	pm	level information	scale (A1 original size)	notes
A	08.12.21	INITIAL ISSUE	MF	MK	DATUM: CONTOUR INTERVAL:	A1 1:750 A3 1:1500	NOTE : PLANS ARE PREPARED IN COLOUR

• project management • civil engineering • infrastructure • superintendency • economic analysis • social impact • town planning • surveying • development feasibility • visualisation • urban design

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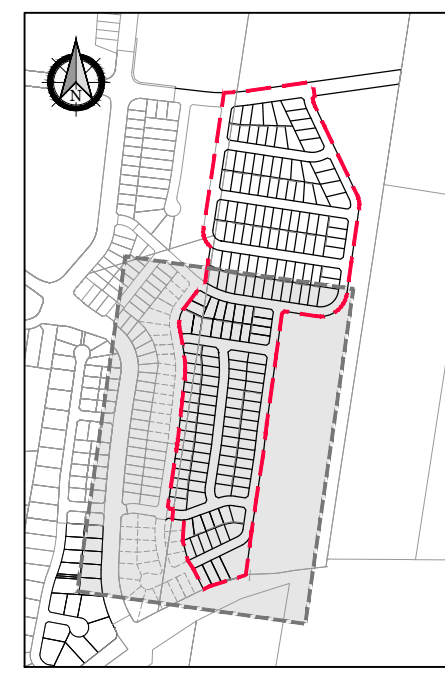
LEGEND

- SITE CADASTRAL BOUNDARY
- PROPOSED DEVELOPMENT APPLICATION
- EXISTING BOUNDARY
- FUTURE BOUNDARY (APPROVED)
- PROPOSED BOUNDARY
- 31** STAGE NUMBER
- PROPOSED LOTS
- RESIDUE LOT

4
D.P.1145348



FUTURE DEVELOPMENT APPLICATION



ver.	date	comment	drawn	pm	level information	scale (A1 original size)	notes
A	08.12.21	INITIAL ISSUE	MF	MK	DATUM: CONTOUR INTERVAL:	A1 0 15.0 30.0 37.5m A3 1:750 1:1500	NOTE : PLANS ARE PREPARED IN COLOUR

EXISTING STAGE

drawing title:
**DETAIL PLAN
STAGE 72**

location: CHISHOLM

council: MAITLAND CITY COUNCIL

dwg ref: 190433(71-72)-DA-107

client:

AVID Property Group **adw johnson**

central coast office ph: (02) 4305 4300
hunter office ph: (02) 4978 5100
sydney office ph: (02) 8046 7411

www.adwjohanson.com.au

Appendix B: AHIMS Search Results

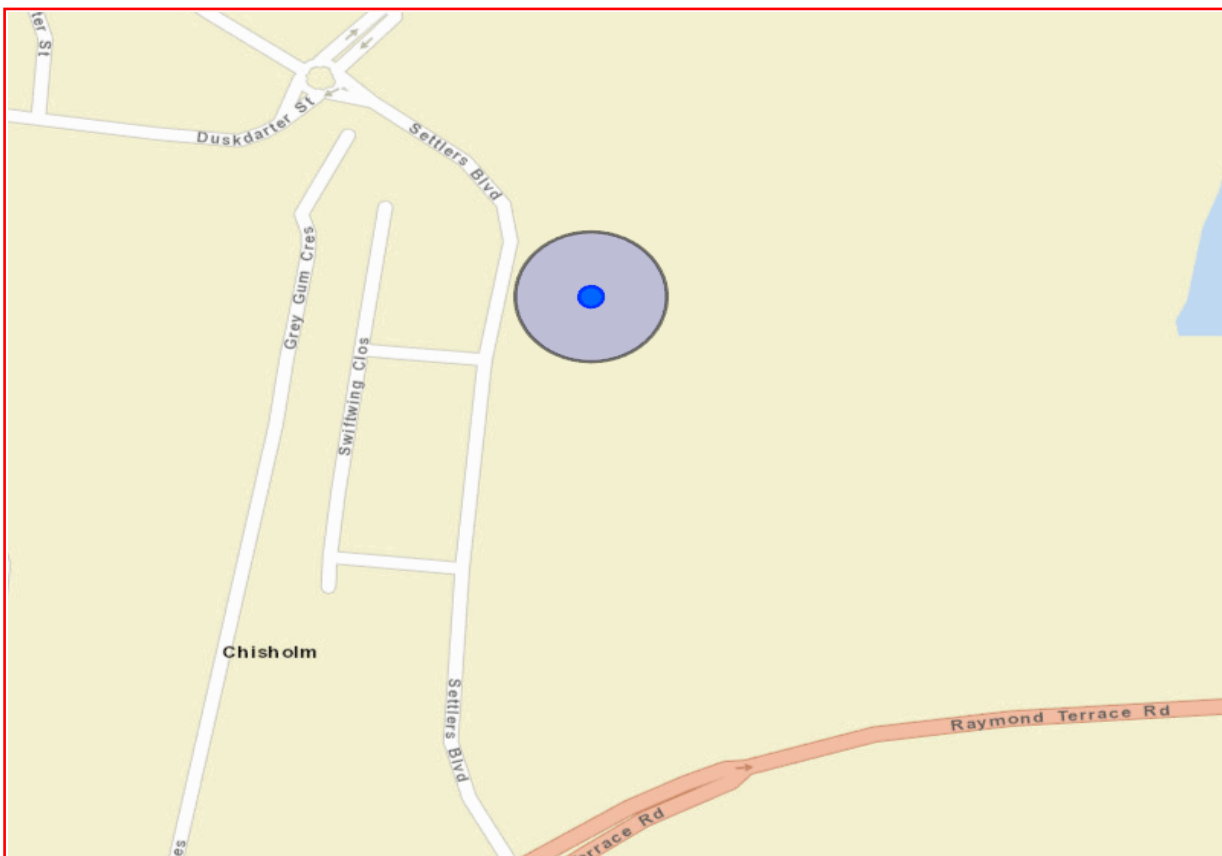
Katrina Greville
21 Costata Crescent
Adamstown New South Wales 2289
Attention: Katrina Greville
Email: klmukevski@bigpond.com

Date: 10 November 2021

Dear Sir or Madam:

AHIMS Web Service search for the following area at Address : 2 SETTLERS BOULEVARD CHISHOLM 2322 with a Buffer of 50 meters, conducted by Katrina Greville on 10 November 2021.

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. *

If your search shows Aboriginal sites or places what should you do?

- You must do an extensive search if AHIMS has shown that there are Aboriginal sites or places recorded in the search area.
- If you are checking AHIMS as a part of your due diligence, refer to the next steps of the Due Diligence Code of practice.
- You can get further information about Aboriginal places by looking at the gazettal notice that declared it. Aboriginal places gazetted after 2001 are available on the [NSW Government Gazette \(https://www.legislation.nsw.gov.au/gazette\)](https://www.legislation.nsw.gov.au/gazette) website. Gazettal notices published prior to 2001 can be obtained from Heritage NSW upon request

Important information about your AHIMS search

- The information derived from the AHIMS search is only to be used for the purpose for which it was requested. It is not to be made available to the public.
- AHIMS records information about Aboriginal sites that have been provided to Heritage NSW and Aboriginal places that have been declared by the Minister;
- Information recorded on AHIMS may vary in its accuracy and may not be up to date. Location details are recorded as grid references and it is important to note that there may be errors or omissions in these recordings,
- Some parts of New South Wales have not been investigated in detail and there may be fewer records of Aboriginal sites in those areas. These areas may contain Aboriginal sites which are not recorded on AHIMS.
- Aboriginal objects are protected under the National Parks and Wildlife Act 1974 even if they are not recorded as a site on AHIMS.
- This search can form part of your due diligence and remains valid for 12 months.

Appendix C: NBC Bushfire Attack Assessor V4.1 Report



NBC Bushfire Attack Assessment Report V4.1

AS3959 (2018) Appendix B - Detailed Method 2

Print Date: 9/12/2021

Assessment Date: 23/09/2021

Site Street Address: 2171A CSR Raymond Terrace Road, Chisholm

Assessor: Stuart Greville; Bushfire Planning Australia

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

Run Description: T1, T2 - stormwater basin (wet basin & turf)

Vegetation Information

Vegetation Type: Non-Hazard

Vegetation Group: Non-Hazard

Vegetation Slope: 4 Degrees

Vegetation Slope Type: Downslope

Surface Fuel Load(t/ha): 0

Overall Fuel Load(t/ha): 0

Vegetation Height(m): 0

Only Applicable to Shrub/Scrub and Vesta

Site Information

Site Slope: 0 Degrees

Site Slope Type: Downslope

Elevation of Receiver(m): Default

APZ/Separation(m): 12

Fire Inputs

Veg./Flame Width(m): 100

Flame Temp(K): 1090

Calculation Parameters

Flame Emissivity: 95

Relative Humidity(%): 25

Heat of Combustion(kJ/kg): 18600

Ambient Temp(K): 308

Moisture Factor: 5

FDI: 100

Program Outputs

Level of Construction: BAL 12.5

Peak Elevation of Receiver(m): 0

Radiant Heat(kW/m²): 0

Flame Angle (degrees): 0

Flame Length(m): 0

Maximum View Factor: 0

Rate Of Spread (km/h): 0

Inner Protection Area(m): 12

Transmissivity: 0.857

Outer Protection Area(m): 0

Fire Intensity(kW/m): 0

BAL Thresholds

BAL-40: BAL-29: BAL-19: BAL-12.5: 10 kw/m²: Elevation of Receiver:

Asset Protection Zone(m): 0 0 0 0 0 6

Run Description: T11 & T12

Vegetation Information

Vegetation Type: Hunter Macleay DSF

Vegetation Group: Dry Sclerophyll Forests (Shrub/Grass)

Vegetation Slope: 2.1 Degrees

Vegetation Slope Type: Downslope

Surface Fuel Load(t/ha): 14

Overall Fuel Load(t/ha): 24.6

Vegetation Height(m): 0.9

Only Applicable to Shrub/Scrub and Vesta

Site Information

Site Slope 1 Degrees

Site Slope Type: Downslope

Elevation of Receiver(m) Default

APZ/Separation(m): 18

Fire Inputs

Veg./Flame Width(m): 100

Flame Temp(K): 1090

Calculation Parameters

Flame Emissivity: 95

Relative Humidity(%): 25

Heat of Combustion(kJ/kg) 18600

Ambient Temp(K): 308

Moisture Factor: 5

FDI: 100

Program Outputs

Level of Construction: BAL 29

Peak Elevation of Receiver(m): 6.74

Radiant Heat(kW/m2): 27.4

Flame Angle (degrees): 65

Flame Length(m): 15.57

Maximum View Factor: 0.425

Rate Of Spread (km/h): 1.94

Inner Protection Area(m): 14

Transmissivity: 0.848

Outer Protection Area(m): 4

Fire Intensity(kW/m): 24682

BAL Thresholds

BAL-40: BAL-29: BAL-19: BAL-12.5: 10 kw/m2: Elevation of Receiver:

Asset Protection Zone(m): 13 18 25 35 54 6

Run Description: T14

Vegetation Information

Vegetation Type: Hunter Macleay DSF

Vegetation Group: Dry Sclerophyll Forests (Shrub/Grass)

Vegetation Slope: 2.3 Degrees

Vegetation Slope Type: Downslope

Surface Fuel Load(t/ha): 14

Overall Fuel Load(t/ha): 24.6

Vegetation Height(m): 0.9

Only Applicable to Shrub/Scrub and Vesta

Site Information

Site Slope 1 Degrees

Site Slope Type: Downslope

Elevation of Receiver(m) Default

APZ/Separation(m): 18

Fire Inputs

Veg./Flame Width(m): 100

Flame Temp(K): 1090

Calculation Parameters

Flame Emissivity: 95

Relative Humidity(%): 25

Heat of Combustion(kJ/kg) 18600

Ambient Temp(K): 308

Moisture Factor: 5

FDI: 100

Program Outputs

Level of Construction: BAL 29

Peak Elevation of Receiver(m): 6.76

Radiant Heat(kW/m2): 27.72

Flame Angle (degrees): 64

Flame Length(m): 15.75

Maximum View Factor: 0.43

Rate Of Spread (km/h): 1.97

Inner Protection Area(m): 14

Transmissivity: 0.848

Outer Protection Area(m): 4

Fire Intensity(kW/m): 25025

BAL Thresholds

BAL-40: BAL-29: BAL-19: BAL-12.5: 10 kw/m2: Elevation of Receiver:

Asset Protection Zone(m): 13 18 25 35 55 6

Run Description: T3 & T4

Vegetation Information

Vegetation Type: Hunter Macleay DSF
Vegetation Group: Dry Sclerophyll Forests (Shrub/Grass)
Vegetation Slope: 2 Degrees **Vegetation Slope Type:** Upslope
Surface Fuel Load(t/ha): 14 **Overall Fuel Load(t/ha):** 24.6
Vegetation Height(m): 0.9 **Only Applicable to Shrub/Scrub and Vesta**

Site Information

Site Slope: 1 Degrees **Site Slope Type:** Downslope
Elevation of Receiver(m): Default **APZ/Separation(m):** 14

Fire Inputs

Veg./Flame Width(m): 100 **Flame Temp(K):** 1090

Calculation Parameters

Flame Emissivity: 95 **Relative Humidity(%):** 25
Heat of Combustion(kJ/kg) 18600 **Ambient Temp(K):** 308
Moisture Factor: 5 **FDI:** 100

Program Outputs

Level of Construction: BAL 29 **Peak Elevation of Receiver(m):** 5.36
Radiant Heat(kW/m2): 28.74 **Flame Angle (degrees):** 64
Flame Length(m): 12.46 **Maximum View Factor:** 0.44
Rate Of Spread (km/h): 1.46 **Inner Protection Area(m):** 11
Transmissivity: 0.859 **Outer Protection Area(m):** 3
Fire Intensity(kW/m): 18600

BAL Thresholds

BAL-40: BAL-29: BAL-19: BAL-12.5: 10 kw/m2: Elevation of Receiver:
Asset Protection Zone(m): 11 14 21 29 47 6

Run Description: T5

Vegetation Information

Vegetation Type: Hunter Macleay DSF

Vegetation Group: Dry Sclerophyll Forests (Shrub/Grass)

Vegetation Slope: 1 Degrees

Vegetation Slope Type: Downslope

Surface Fuel Load(t/ha): 14

Overall Fuel Load(t/ha): 24.6

Vegetation Height(m): 0.9

Only Applicable to Shrub/Scrub and Vesta

Site Information

Site Slope 1 Degrees

Site Slope Type: Downslope

Elevation of Receiver(m) Default

APZ/Separation(m): 17

Fire Inputs

Veg./Flame Width(m): 100

Flame Temp(K): 1090

Calculation Parameters

Flame Emissivity: 95

Relative Humidity(%): 25

Heat of Combustion(kJ/kg) 18600

Ambient Temp(K): 308

Moisture Factor: 5

FDI: 100

Program Outputs

Level of Construction: BAL 29

Peak Elevation of Receiver(m): 6.34

Radiant Heat(kW/m2): 27.42

Flame Angle (degrees): 65

Flame Length(m): 14.65

Maximum View Factor: 0.424

Rate Of Spread (km/h): 1.8

Inner Protection Area(m): 13

Transmissivity: 0.85

Outer Protection Area(m): 4

Fire Intensity(kW/m): 22878

BAL Thresholds

BAL-40: BAL-29: BAL-19: BAL-12.5: 10 kw/m2: Elevation of Receiver:

Asset Protection Zone(m): 13 17 24 34 52 6

Run Description: T6

Vegetation Information

Vegetation Type: Hunter Macleay DSF

Vegetation Group: Dry Sclerophyll Forests (Shrub/Grass)

Vegetation Slope: 3 Degrees

Vegetation Slope Type: Upslope

Surface Fuel Load(t/ha): 14

Overall Fuel Load(t/ha): 24.6

Vegetation Height(m): 0.9

Only Applicable to Shrub/Scrub and Vesta

Site Information

Site Slope 1 Degrees

Site Slope Type: Downslope

Elevation of Receiver(m) Default

APZ/Separation(m): 14

Fire Inputs

Veg./Flame Width(m): 100

Flame Temp(K): 1090

Calculation Parameters

Flame Emissivity: 95

Relative Humidity(%): 25

Heat of Combustion(kJ/kg) 18600

Ambient Temp(K): 308

Moisture Factor: 5

FDI: 100

Program Outputs

Level of Construction: BAL 29

Peak Elevation of Receiver(m): 5.16

Radiant Heat(kW/m2): 27.24

Flame Angle (degrees): 66

Flame Length(m): 11.83

Maximum View Factor: 0.417

Rate Of Spread (km/h): 1.37

Inner Protection Area(m): 11

Transmissivity: 0.858

Outer Protection Area(m): 3

Fire Intensity(kW/m): 17360

BAL Thresholds

BAL-40: BAL-29: BAL-19: BAL-12.5: 10 kw/m2: Elevation of Receiver:

Asset Protection Zone(m): 10 14 20 28 45 6

Run Description: T7

Vegetation Information

Vegetation Type: Hunter Macleay DSF

Vegetation Group: Dry Sclerophyll Forests (Shrub/Grass)

Vegetation Slope: 4.1 Degrees

Vegetation Slope Type: Upslope

Surface Fuel Load(t/ha): 14

Overall Fuel Load(t/ha): 24.6

Vegetation Height(m): 0.9

Only Applicable to Shrub/Scrub and Vesta

Site Information

Site Slope 1 Degrees

Site Slope Type: Downslope

Elevation of Receiver(m) Default

APZ/Separation(m): 12

Fire Inputs

Veg./Flame Width(m): 100

Flame Temp(K): 1090

Calculation Parameters

Flame Emissivity: 95

Relative Humidity(%): 25

Heat of Combustion(kJ/kg) 18600

Ambient Temp(K): 308

Moisture Factor: 5

FDI: 100

Program Outputs

Level of Construction: BAL 29

Peak Elevation of Receiver(m): 4.9

Radiant Heat(kW/m2): 25.72

Flame Angle (degrees): 67

Flame Length(m): 11.18

Maximum View Factor: 0.395

Rate Of Spread (km/h): 1.27

Inner Protection Area(m): 11

Transmissivity: 0.857

Outer Protection Area(m): 3

Fire Intensity(kW/m): 16091

BAL Thresholds

BAL-40: BAL-29: BAL-19: BAL-12.5: 10 kw/m2: Elevation of Receiver:

Asset Protection Zone(m): 9 13 19 27 43 6

Run Description: T8, T9 & T10

Vegetation Information

Vegetation Type: Hunter Macleay DSF

Vegetation Group: Dry Sclerophyll Forests (Shrub/Grass)

Vegetation Slope: 1.7 Degrees

Vegetation Slope Type: Downslope

Surface Fuel Load(t/ha): 14

Overall Fuel Load(t/ha): 24.6

Vegetation Height(m): 0.9

Only Applicable to Shrub/Scrub and Vesta

Site Information

Site Slope 1 Degrees

Site Slope Type: Downslope

Elevation of Receiver(m) Default

APZ/Separation(m): 17

Fire Inputs

Veg./Flame Width(m): 100

Flame Temp(K): 1090

Calculation Parameters

Flame Emissivity: 95

Relative Humidity(%): 25

Heat of Combustion(kJ/kg) 18600

Ambient Temp(K): 308

Moisture Factor: 5

FDI: 100

Program Outputs

Level of Construction: BAL 29

Peak Elevation of Receiver(m): 6.55

Radiant Heat(kW/m2): 28.53

Flame Angle (degrees): 64

Flame Length(m): 15.23

Maximum View Factor: 0.441

Rate Of Spread (km/h): 1.89

Inner Protection Area(m): 13

Transmissivity: 0.851

Outer Protection Area(m): 4

Fire Intensity(kW/m): 24010

BAL Thresholds

BAL-40: BAL-29: BAL-19: BAL-12.5: 10 kw/m2: Elevation of Receiver:

Asset Protection Zone(m): 13 17 25 35 54 6

Appendix D: Planning for Bushfire Protection 2019 Compliance Table

Table 1: Aims and Objectives of Planning for Bushfire Protection 2019

Objectives	Satisfied	Comment
<ul style="list-style-type: none"> ➤ Afford buildings and their occupants protection from exposure to a bush fire 	<p>✓</p>	<p>All lots within the proposed development are provided with sufficient separation from the nearest bushfire hazard by public perimeter roads or adequate APZs and are provided with up to 5 different evacuation routes.</p>
<ul style="list-style-type: none"> ➤ Provide for a defensible space to be located around buildings 	<p>✓</p>	<p>Defensible space by way of an APZ is provided between all new lots and the bushfire hazard to ensure radiant heat levels are below critical limits (29kW/m²).</p>
<ul style="list-style-type: none"> ➤ Provide appropriate separation between a hazard and buildings, which, in combination with other measures, prevent the likely fire spread to buildings 	<p>✓</p>	<p>Appropriate APZs are provided between the proposed additional lots and the hazard, which in addition to other mitigation measures such as suitable construction, will provide an acceptable level of protection to the buildings, and prevent the spread of fire to the buildings and onto adjoining buildings.</p>
<ul style="list-style-type: none"> ➤ Ensure that safe operational access and egress for emergency service personnel and residents is available 	<p>✓</p>	<p>Public road access to the development will only be possible following completion of the residential subdivision to the west of site. Four (4) new public roads connect the subject site to the wider public road network to the west, and onto Settlers Boulevard. Provision has also been made for a new road connection to the east across Tigerhawk Drive.</p>
<ul style="list-style-type: none"> ➤ Provide for ongoing management and maintenance of BPMs 	<p>✓</p>	<p>All owners will be responsible for the management and maintenance of the private property.</p>
<ul style="list-style-type: none"> ➤ Ensure that utility services are adequate to meet the needs of firefighters 	<p>✓</p>	<p>The development includes all essential utility services to meet the needs of firefighters; including a reliable water supply.</p>

Table 2: Performance Criteria and Acceptable Solutions for residential subdivisions (Chapter 5 PBP 2019)

Intent of Measure	Performance Criteria	Acceptable Solution	Complies	Comment
			✓ - Acceptable Solution AS - Alternative Solution	
5.3.1 ASSET PROTECTION ZONES Table 5.3a To provide sufficient space and maintain reduced fuel loads, so as to ensure radiant heat levels at buildings are below critical limits and to prevent direct flame contact with a building.	Potential building footprints must not be exposed to radiant heat levels exceeding 29kW/m ² on each proposed lot.	APZs are provided in accordance with Tables A1.12.2 and A1.12.3 based on the FFDI.	✓/AS	All new lots are able to accommodate a building envelope that ensures future dwellings are exposed to BAL-29 or less; thereby ensuring no dwellings are exposed to radiant heat levels greater than 29kW/m ² . The APZs were calculated using Method 2 (AS39590-2018) to demonstrate the minimum required APZ.
	APZs are managed and maintained to prevent the spread of a fire towards the building.	The APZ is managed in accordance with the requirements of Appendix 4	✓	All new landowners will be required to manage their respective lot as an IPA.
	The APZ is provided in perpetuity.	APZs are wholly within the boundaries of the development site.	✓	There are no exceptional circumstances that would require an APZ to be located external to the development site.
	APZ maintenance is practical, soil stability is not compromised and the potential for crown fires is negated.	The APZ is not located on lands with a slope exceeding 18°	✓	The maximum slope of the site is 5° or less.
LANDSCAPING	Landscaping is designed and managed to minimise flame contact and radiant heat to buildings, and the potential for wind-driven embers to cause ignitions.	Landscaping is in accordance with APZ standards (see Appendix 4). Fencing is constructed in accordance with section 7.6.	✓	All new landscaping has considered the requirements of APZs per Appendix 4. All new fencing will be colorbond or similar non-combustible material
5.3.2 ACCESS (General Requirements) Table 5.3b To provide safe operational access for emergency services personnel in suppressing a bush fire, while residents are accessing or egressing an area.	Fire fighters are provided with safe all weather access to structures	Property access roads are two-wheel drive, all-weather roads	✓	All new roads are a minimum 8m wide (including non-perimeter roads) and satisfy PBP 2019 and Maitland City Council engineering standards. A minimum of two (2) access routes will be provided to the subdivision following completion of the first stage. Ultimately five (5) access routes will be available for residents within the proposed subdivision.
		Perimeter roads are provided for residential subdivisions of three or more allotments	✓	
		Subdivisions of three or more allotments have more than one access in and out of the development	✓	
		Traffic management devices are constructed to not prohibit access by	✓	

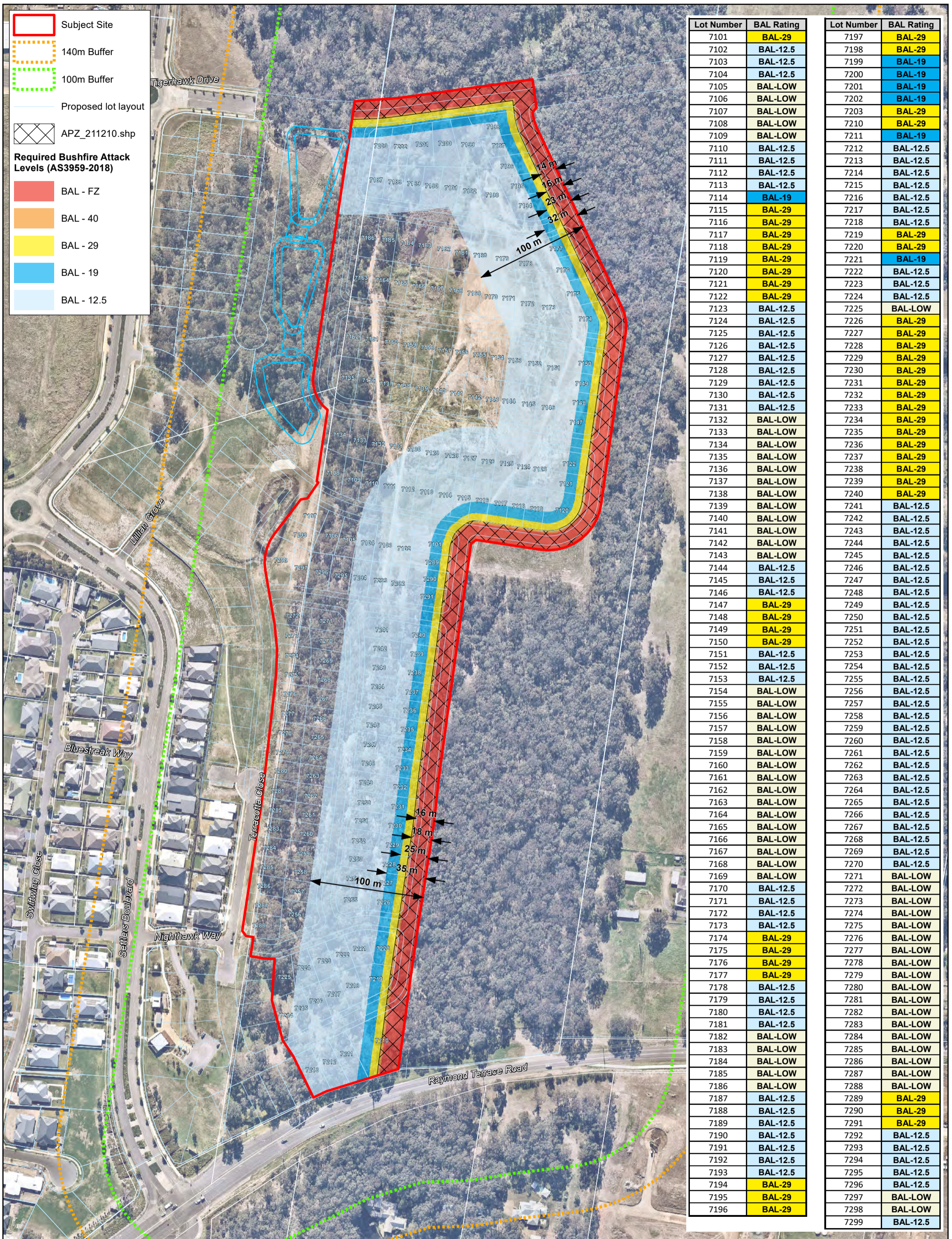
Intent of Measure	Performance Criteria	Acceptable Solution	Complies	Comment
			✓ - Acceptable Solution AS - Alternative Solution	
		emergency services vehicles.		
		Access roads must provide suitable turning areas in accordance with Appendix 3.	✓	
ACCESS ROAD CAPACITY	The capacity of access roads is adequate for firefighting vehicles.	The capacity of road surfaces and any bridges/causeways is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes); bridges and causeways are to clearly indicate load rating.	✓	All new roads are designed in accordance with MCC engineering specifications. The proposed roads will have sufficient load capacity for all firefighting vehicles.
ACCESS TO WATER	There is appropriate access to water supply.	Hydrants are located outside of parking reserves and road carriageways to ensure accessibility to reticulated water for fire suppression.	✓	All proposed lots are able to be connected to a reticulated water supply.
		Hydrants are provided in accordance with AS2419.1:2005	✓	
		There is suitable access for Category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available.	✓	
PERIMETER ROADS	Perimeter access roads are designed to allow safe access and egress for medium rigid firefighting vehicles while occupants are evacuating as well as providing a safe operational environment for emergency service personnel during firefighting and emergency management on the interface.	There are two-way sealed roads.	✓	The entire development is protected by a perimeter road with the exception of Lot 7210 which adjoins Raymond Terrace Road and the unmanaged vegetation to the west. Lot 7210 as a front and rear frontage to a public road and a perimeter along the eastern boundary is not considered necessary. All perimeter roads are a minimum 8m wide and are designed in accordance with the relevant PBP 2019 design requirements.
		8m carriageway width kerb to kerb.	✓	
		Hydrants are to be located clear of parking areas.	✓	
		There 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° and average grade is 10°.	✓	
		The road crossfall does not exceed 3°.	✓	

Intent of Measure	Performance Criteria	Acceptable Solution	Complies	Comment
			✓ - Acceptable Solution AS - Alternative Solution	
		A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches; and	✓	
NON-PERIMETER ROADS	Non-perimeter access roads are designed to allow safe access and egress for medium rigid firefighting vehicles while occupants are evacuating.	Minimum 5.5m width kerb to kerb.	✓	All roads; including non-perimeter roads are 8m wide will be constructed in accordance with PBP 2019.
		Parking is provided outside of the carriageway.	✓	
		Hydrants are to be located clear of parking areas.	✓	
		There 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° and average grade is 10°.	✓	
		The road crossfall does not exceed 3°.	✓	
		A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches; and	✓	
5.3.3 SERVICES Table 5.3c	Adequate water supplies is provided for firefighting purposes	Reticulated water is to be provided to the development, where available	✓	A reticulated water supply is provided.
		A static water supply is provided where no reticulated water is available	N/A	
		Static water supplies shall comply with Table 5.3d	N/A	
WATER	Water supplies are located at regular intervals	Fire hydrant spacing, design and sizing comply with AS2419.1:2005;	✓	A reticulated water supply is provided.
		Hydrants are not located within any road carriageway;	✓	

Intent of Measure	Performance Criteria	Acceptable Solution	Complies	Comment
			✓ - Acceptable Solution AS - Alternative Solution	
	The water supply is accessible and reliable for firefighting operations	Reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter roads.	✓	A reticulated water supply is provided.
	Flows and pressures are appropriate	Fire hydrant flows and pressures comply with AS2419.1:2005.	✓	
	The integrity of the water supply is maintained	All above ground water service pipes are metal, including and up to any taps.	Able to comply	
ELECTRICITY	Location of electricity services limits the possibility of ignition of surrounding bushland or the fabric of buildings.	Where practicable, electrical transmission lines are underground.	✓	The proposed new lots will be connected to the existing underground electricity service.
		Where overhead electrical transmission lines are proposed as follows: → 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	N/A	
GAS	Location of gas services will not lead to ignition of surrounding bushland or the fabric of buildings.	Reticulated or bottled gas is installed and maintained in accordance with AS 1596:2014 and the requirements of relevant authorities, metal piping is to be used.	✓	Any new gas connections will be underground and will be unlikely to create an additional hazard risk to surrounding bushland.
		All fixed gas cylinders are kept clear of all flammable materials to a distance of 10 metres and shielded on the hazard side;		

Intent of Measure	Performance Criteria	Acceptable Solution	Complies	Comment
			✓ - Acceptable Solution AS - Alternative Solution	
		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.		

Appendix E: Subdivision BAL Plan – Bushfire Planning Australia dated 9 December 2021



Lot Number	BAL Rating
7101	BAL-29
7102	BAL-12.5
7103	BAL-12.5
7104	BAL-12.5
7105	BAL-LOW
7106	BAL-LOW
7107	BAL-LOW
7108	BAL-LOW
7109	BAL-LOW
7110	BAL-12.5
7111	BAL-12.5
7112	BAL-12.5
7113	BAL-12.5
7114	BAL-19
7115	BAL-29
7116	BAL-29
7117	BAL-29
7118	BAL-29
7119	BAL-29
7120	BAL-29
7121	BAL-29
7122	BAL-29
7123	BAL-12.5
7124	BAL-12.5
7125	BAL-12.5
7126	BAL-12.5
7127	BAL-12.5
7128	BAL-12.5
7129	BAL-12.5
7130	BAL-12.5
7131	BAL-12.5
7132	BAL-LOW
7133	BAL-LOW
7134	BAL-LOW
7135	BAL-LOW
7136	BAL-LOW
7137	BAL-LOW
7138	BAL-LOW
7139	BAL-LOW
7140	BAL-LOW
7141	BAL-LOW
7142	BAL-LOW
7143	BAL-LOW
7144	BAL-12.5
7145	BAL-12.5
7146	BAL-12.5
7147	BAL-29
7148	BAL-29
7149	BAL-29
7150	BAL-29
7151	BAL-12.5
7152	BAL-12.5
7153	BAL-12.5
7154	BAL-LOW
7155	BAL-LOW
7156	BAL-LOW
7157	BAL-LOW
7158	BAL-LOW
7159	BAL-LOW
7160	BAL-LOW
7161	BAL-LOW
7162	BAL-LOW
7163	BAL-LOW
7164	BAL-LOW
7165	BAL-LOW
7166	BAL-LOW
7167	BAL-LOW
7168	BAL-LOW
7169	BAL-LOW
7170	BAL-12.5
7171	BAL-12.5
7172	BAL-12.5
7173	BAL-12.5
7174	BAL-29
7175	BAL-29
7176	BAL-29
7177	BAL-29
7178	BAL-12.5
7179	BAL-12.5
7180	BAL-12.5
7181	BAL-12.5
7182	BAL-LOW
7183	BAL-LOW
7184	BAL-LOW
7185	BAL-LOW
7186	BAL-LOW
7187	BAL-12.5
7188	BAL-12.5
7189	BAL-12.5
7190	BAL-12.5
7191	BAL-12.5
7192	BAL-12.5
7193	BAL-12.5
7194	BAL-29
7195	BAL-29
7196	BAL-29

Lot Number	BAL Rating
7197	BAL-29
7198	BAL-29
7199	BAL-19
7200	BAL-19
7201	BAL-19
7202	BAL-19
7203	BAL-29
7210	BAL-29
7211	BAL-19
7212	BAL-12.5
7213	BAL-12.5
7214	BAL-12.5
7215	BAL-12.5
7216	BAL-12.5
7217	BAL-12.5
7218	BAL-12.5
7219	BAL-29
7220	BAL-29
7221	BAL-19
7222	BAL-12.5
7223	BAL-12.5
7224	BAL-12.5
7225	BAL-LOW
7226	BAL-29
7227	BAL-29
7228	BAL-29
7229	BAL-29
7230	BAL-29
7231	BAL-29
7232	BAL-29
7233	BAL-29
7234	BAL-29
7235	BAL-29
7236	BAL-29
7237	BAL-29
7238	BAL-29
7239	BAL-29
7240	BAL-29
7241	BAL-12.5
7242	BAL-12.5
7243	BAL-12.5
7244	BAL-12.5
7245	BAL-12.5
7246	BAL-12.5
7247	BAL-12.5
7248	BAL-12.5
7249	BAL-12.5
7250	BAL-12.5
7251	BAL-12.5
7252	BAL-12.5
7253	BAL-12.5
7254	BAL-12.5
7255	BAL-12.5
7256	BAL-12.5
7257	BAL-12.5
7258	BAL-12.5
7259	BAL-12.5
7260	BAL-12.5
7261	BAL-12.5
7262	BAL-12.5
7263	BAL-12.5
7264	BAL-12.5
7265	BAL-12.5
7266	BAL-12.5
7267	BAL-12.5
7268	BAL-12.5
7269	BAL-12.5
7270	BAL-12.5
7271	BAL-LOW
7272	BAL-LOW
7273	BAL-LOW
7274	BAL-LOW
7275	BAL-LOW
7276	BAL-LOW
7277	BAL-LOW
7278	BAL-LOW
7279	BAL-LOW
7280	BAL-LOW
7281	BAL-LOW
7282	BAL-LOW
7283	BAL-LOW
7284	BAL-LOW
7285	BAL-LOW
7286	BAL-LOW
7287	BAL-LOW
7288	BAL-LOW
7289	BAL-29
7290	BAL-29
7291	BAL-29
7292	BAL-12.5
7293	BAL-12.5
7294	BAL-12.5
7295	BAL-12.5
7296	BAL-12.5
7297	BAL-LOW
7298	BAL-LOW
7299	BAL-12.5