BUSHFIRE ASSESSMENT REPORT

Harris-May Residential Subdivision

173 McFarlanes Road & 507 Raymond Terrace Road, Chisholm

Prepared for Allam Development No 1 Pty Ltd

Bushfire Planning Australia

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Date: 23 May 2023

Disclaimer and Limitation

This report is prepared solely for Allam Development No 1 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: 2179 - Residential Subdivision

Version	Status	Purpose	Author	Review Date
1	Draft	Draft for Review	Katrina Mukevski	1 May 2023
2	Draft	Draft for Client Review	Stuart Greville	5 May 2023
3	Final	Final for Submission	Stuart Greville	23 May 2023

Certification

As the author of this Bushfire Assessment Report (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

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BPAD Bushfire Planning & Design Accredited Practitioner Level 2

Date: 23 May 2023

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

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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)

Executive Summary

Bushfire Planning Australia (BPA) has been engaged by Allam Development No 1 Pty Ltd (the 'Client') to undertake a Bushfire Assessment Report (BAR) for the proposed residential subdivision known as the 'Harris-May site' located at 173 McFarlanes Road and 507 Raymond Terrace Road, Chisholm; legally referred to as Lot 32 and Lot 31 DP778111 respectively.

The proposed development comprises a 264 Torrens title residential subdivision to be constructed in several stages. The proposed subdivision is consistent with the Thornton North Master Plan prepared by Maitland City Council. As the plan of subdivision is consistent with the Master Plan, the proposed subdivision does not currently have access to an existing public road. Consequently, development of the subject site cannot be completed until the subdivision of one or more of the adjoining properties has been completed. With this in mind, in addition to assessing the existing bushfire hazard, the BAR designed a series of recommendations relevant to the proposed subdivision following subdivision of the adjoining properties.

This BAR found the site was currently exposed to high bushfire hazard located to the west of the subject site. The predominant vegetation surrounding the site in unmanaged conditions is consistent with a *forest,* specifically *Hunter Macleay Dry Sclerophyll Forest* vegetation formation as described in the NSW Rural Fire Service document Planning for Bushfire Protection 2019 (PBP 2019).

The bushfire hazard will be substantially reduced over the next 2-5 years as a significant area of land surrounding the subject site that is currently zoned for residential use will be subdivided and the remaining hazardous vegetation removed.

The remaining vegetation presenting a long-term bushfire hazard is located immediately west of the site. A smaller portion of vegetation to be retained is located along the northern portion of the eastern boundary. A narrow bushfire hazard (<30m wide) is contained within the riparian corridor that bisects the subject site. The entire development is separated from all adjacent hazards by perimeter roads.

As the site is identified as the Thornton North Urban Release Area in the Maitland Local Government Area Bush Fire Planning - Urban Release Area Map, 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).

The following key recommendations have been designed to enable the proposed development to achieve the aims and objectives of PBP 2019:

1. All land within the development site; excluding the riparian corridor and the lot identified for open space, is to be managed as an inner protection area (IPA) as outlined Appendix 4 of PBP 2019 and the RFS document *Standards for asset protection zones*;
2. The APZs shown in **Figure 19 - 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 the Performance Criteria detailed in Table 5.3b of PBP 2019. This will require the provision of a minimum of twelve (12) separate road access points provided from the development site to the east and west to ensure safe evacuation for all residents;
4. Non-perimeter roads shall be 8m wide (including provision for on-street parking);
5. Perimeter roads shall be 10.5m wide (including provision for on-street parking);

6. On-street vehicle parking may be permitted within road carriageways on roads with a minimum 8m wide carriageway;
7. All temporary turning heads shall be constructed in accordance Appendix A3.3 of PBP 2019;
8. 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);
9. The Bushfire Attack Level (BAL) ratings identified in **Figure 19 - 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;
10. 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;
11. Consideration should be given to landscaping and fuel loads on site to decrease potential fire hazards on site; and
12. The Rural Fire Service endorse the Subdivision BAL Plan contained in **Appendix E**.

This assessment has been made based on the bushfire hazards observed in and around the site at the time of inspection and production (May 2023).

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.

1. Introduction

Bushfire Planning Australia (BPA) has been engaged by Allam Development No 1 Pty Ltd (the 'Client') to undertake a Bushfire Assessment Report (BAR) for the proposed residential subdivision known as the 'Harris-May site' located at 173 McFarlanes Road and 507 Raymond Terrace Road, Chisholm; legally referred to as Lot 32 and Lot 31 DP778111 respectively and hereafter referred to as the 'site' (**Figure 2**).

The proposed development will create 264 residential lots and associated infrastructure including 3 public reserve lots and 1 residue lot across six stages.

The assessment aims to consider and assess the bushfire hazard and associated potential bushfire threat relevant to the proposed development, and to outline the minimum mitigative measures which would be required in accordance with the provisions of the New South Wales Rural Fire Service (RFS) publication *Planning for Bushfire Protection 2019* (PBP 2019) that has been released and adopted through the *Environmental Planning and Assessment Amendment* (Planning for Bushfire Protection) *Regulation 2007* and the *Rural Fires Regulation 2013*.

2. Site Description

Table 1: Site Details

Address	507 Raymond Terrace Road & 173 McFarlanes Road, Chisholm
Title	Lot 31 & Lot 32 DP778111
LGA	Maitland City Council
Site Area	30.28 ha
Land Use Zone	R1 General Residential
Bushfire Prone Land	Vegetation Category 1, Vegetation Category 3 and Vegetation Buffer
Context	The site is north of Raymond Terrace Road and south of McFarlanes Road and consists of two dams and two dwellings, one on each development lot. There is some mature vegetation scattered throughout the site, lining the site boundaries otherwise the remainder of the site is managed.
Topography	Majority of the site is flat with exception of a small portion of the site surrounding the northern dam.
Fire History	The site lies within a local government area with a Fire Danger Index (FDI) rating of 100.

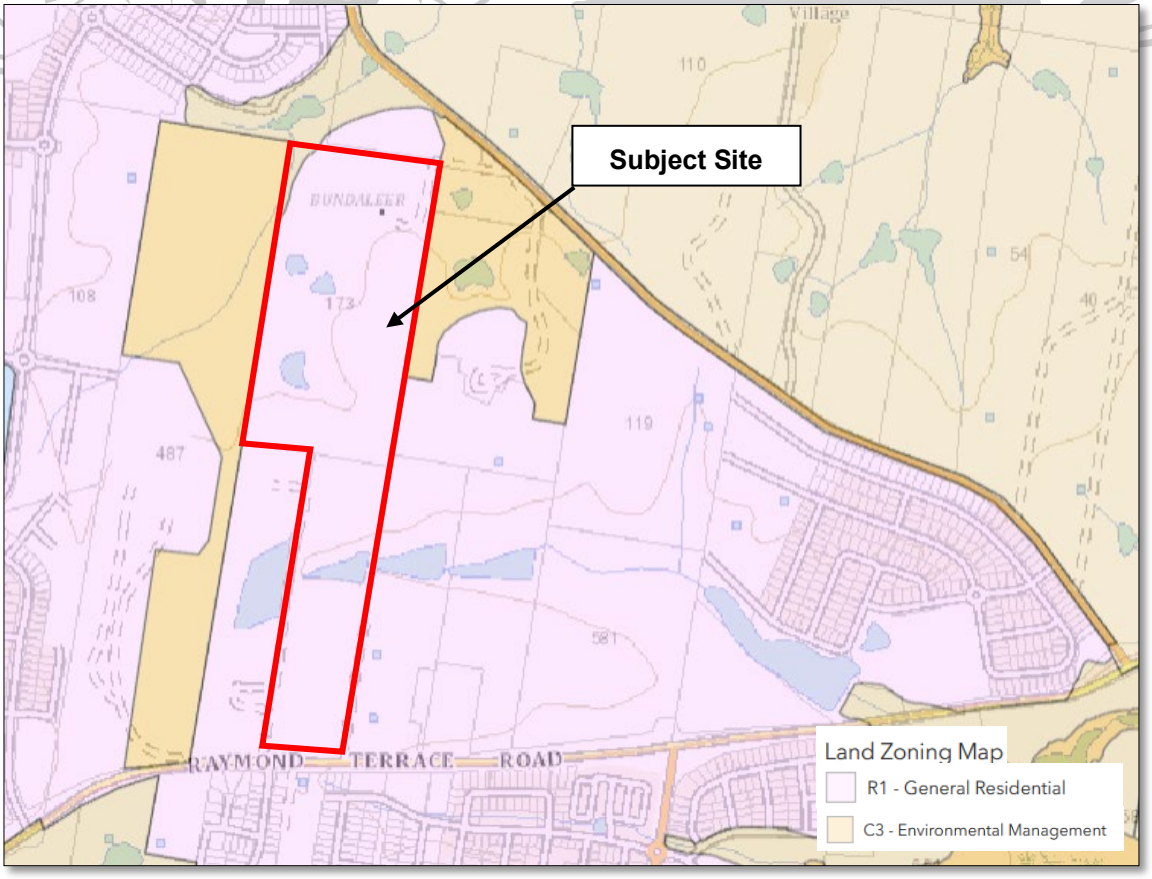
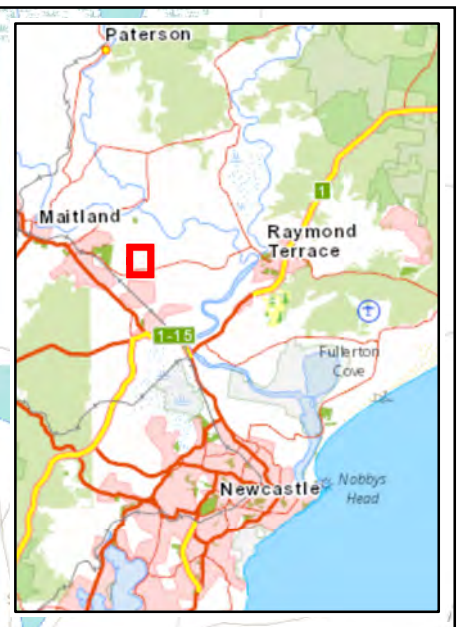


Figure 1: Land Use Zone

Subject Site

140m Buffer

100m Buffer



BUSHFIRE PLANNING AUSTRALIA	Source:	Base Map © Department of Customer Service 2020	N 0 50 100 150 200 Meters A3 Scale: 1:600,000 Coordinate System: GDA 1994 MGA Zone 56	**Project: 173 McFarlanes Road, Chisholm**	**Figure 2:** **Site Location**
	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: McFarlanesRd-Fig1-SiteLocation-230301 Date: 1/03/2023			

2.1. Background

The subject site is located within the Thornton North Urban Release Area which was designed to 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 relies on public road connections to the north, east and west that currently do not exist. 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.

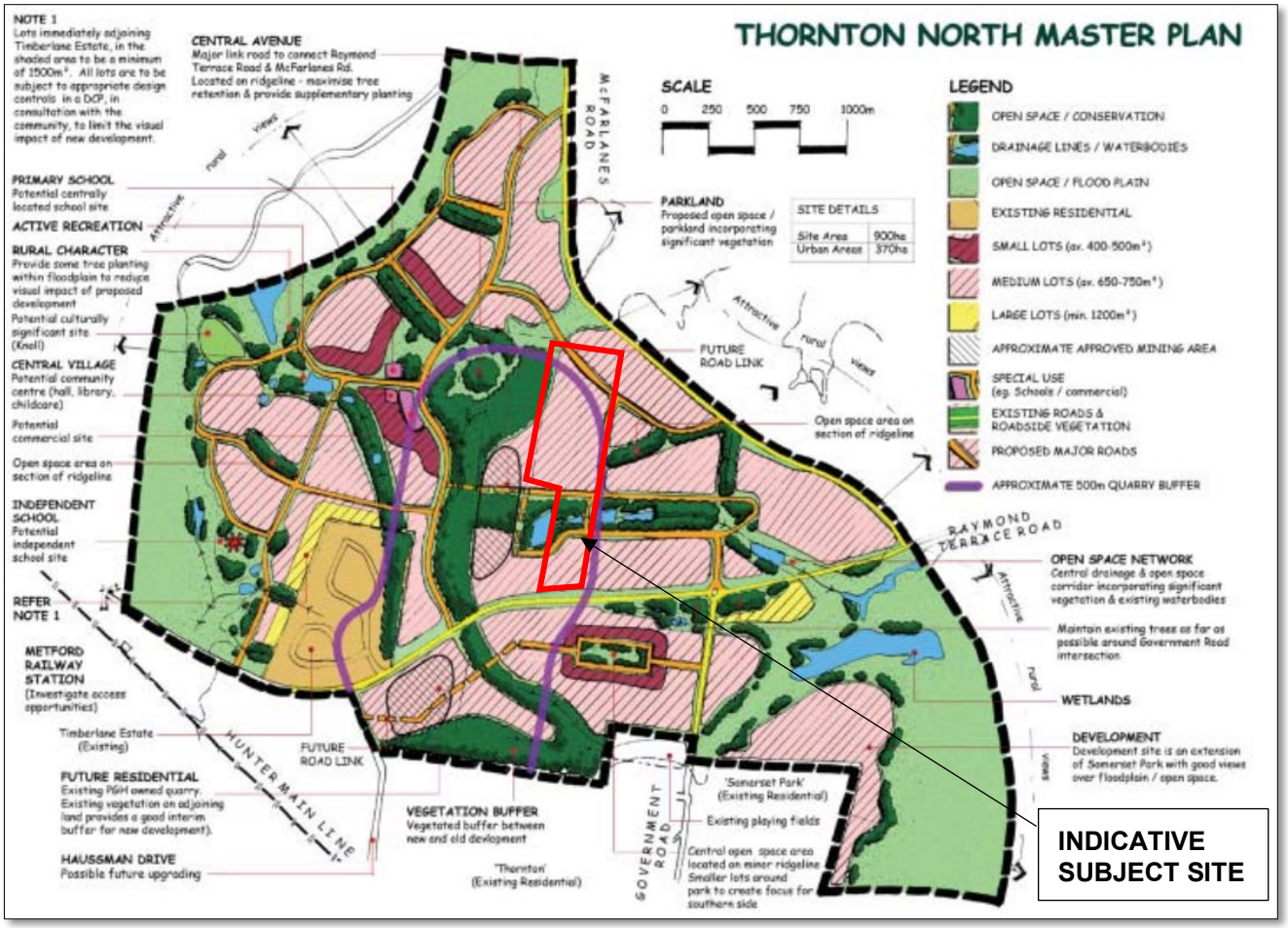


Figure 3: Thornton North Master Plan (Maitland City Council 2003)

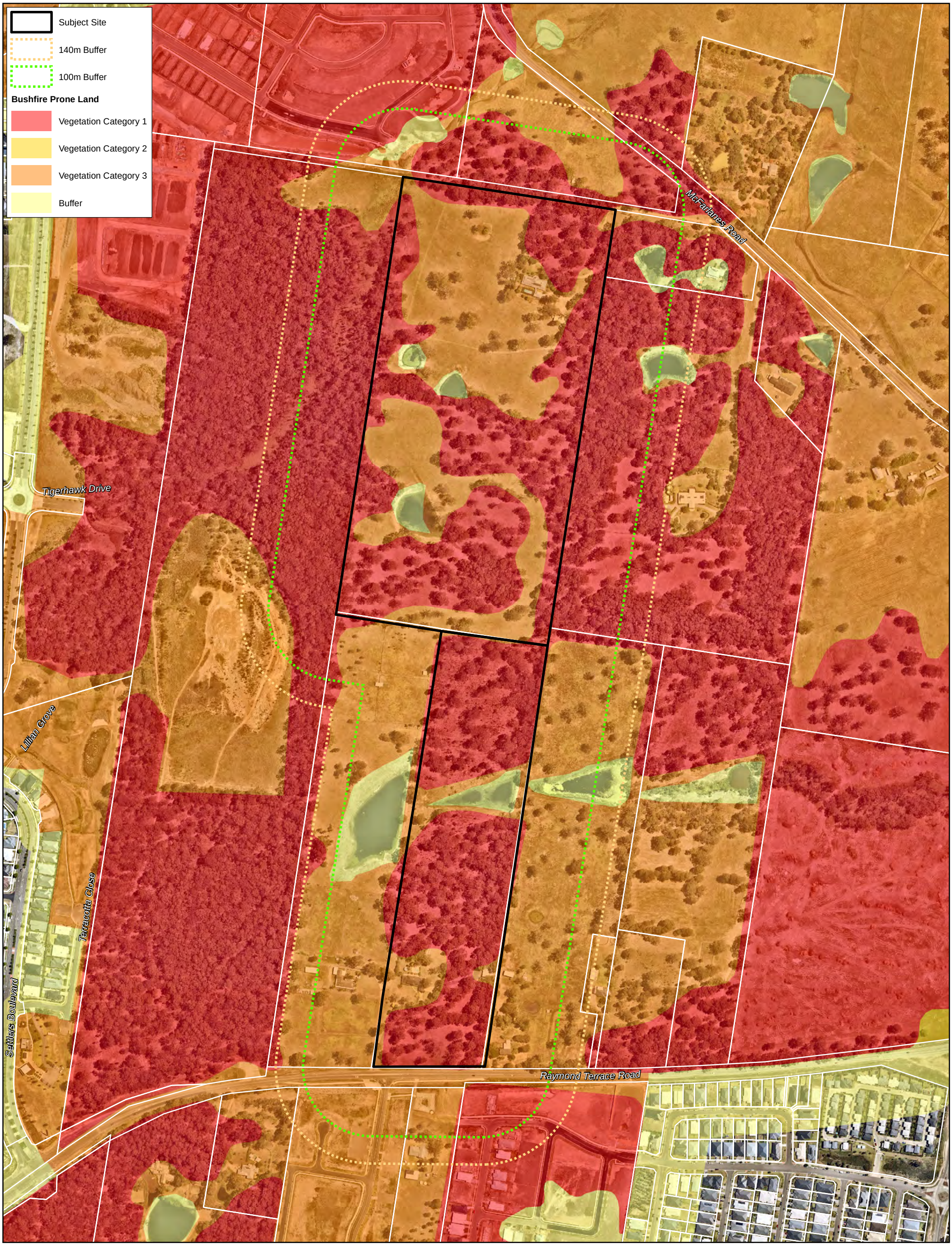
2.2. Bushfire Prone Land

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 4 demonstrates the entire majority of site is mapped as bushfire prone land.

A large portion of the southern development site (Lot 31) is mapped as Vegetation Category 1 bushfire prone land with exception of the land surrounding the existing dam which is mapped as Vegetation Buffer. Similarly, the northern development site is largely mapped as Vegetation Category 3 and whilst the lid section of the site is mapped as Vegetation Category 1 which extends to and beyond 140m north, east and west of the site boundary.

The primary bushfire hazard within and beyond 140m of the site is located to the west. An additional bushfire hazard also exists to the north-west of the site.



BUSHFIRE PLANNING AUSTRALIA	Source:	Cadastral Boundary: NSW Department of Finance, Services and Innovation 2021 Aerial photo: NearMap 03/01/2023 NSW Bush Fire Prone Land: NSW Rural Fire Service 2022	0 50 100 150 200 Meters A3 Scale: 1:5,000 Coordinate System: GDA 1994 MGA Zone 56
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	File:	File: 2179-McFarlanesRd-Fig2-BFPL-230502 Date: 3/05/2023	

Project: 173 McFarlanes Road, Chisholm
Job no: 2179

Figure 4:

NSW Bush Fire Prone Land

2.3. Proposed Development

The proposed development will create 264 residential lots and associated infrastructure including 3 public reserve lots, and 1 residue lot. This will occur over the following six stages:

- Stage 1: 41 lots and 1 public reserve lot
- Stage 2: 54 lots
- Stage 3: 46 lots and 1 public reserve lot
- Stage 4: 55 lots
- Stage 5: 36 lots and 1 public reserve lot
- Stage 6: 32 lots and 1 public reserve lot

A plan of the proposed subdivision is contained in **Appendix A** and shown in **Figure 5.**

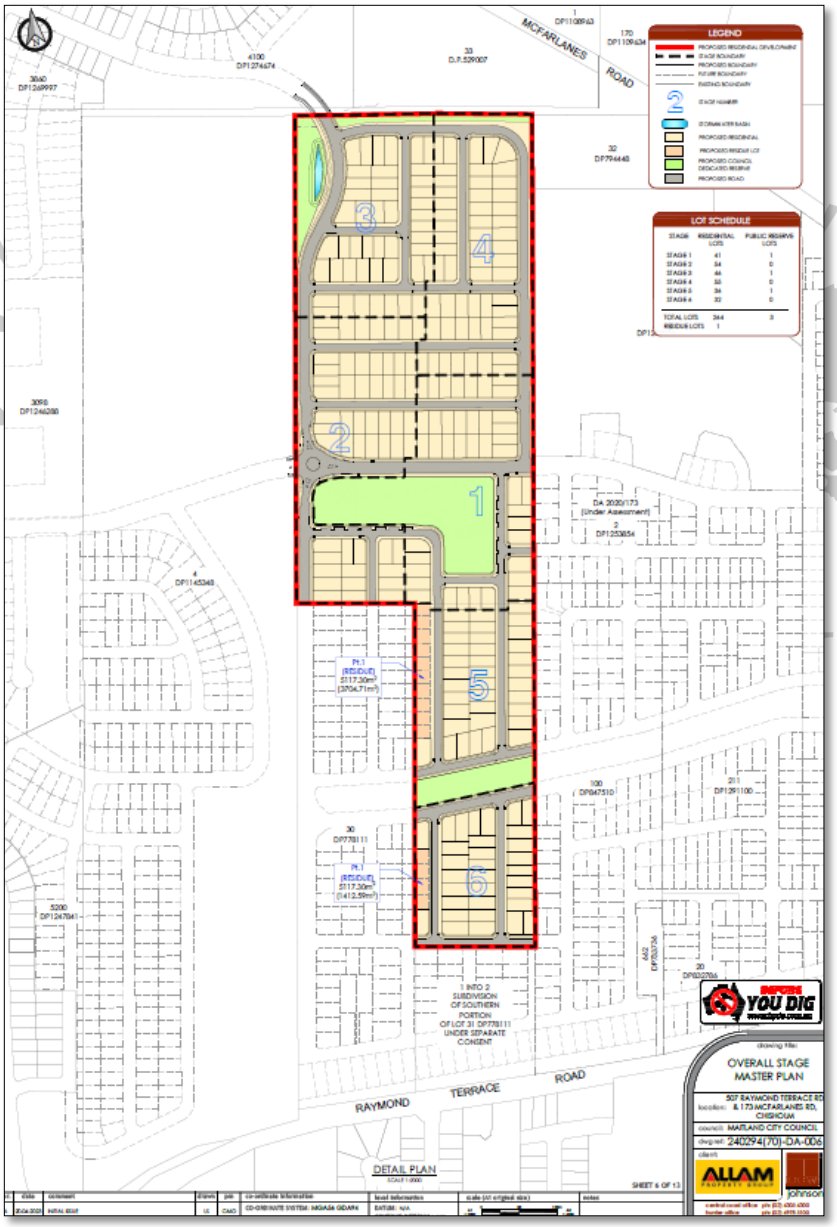

Figure 5: Proposed Development

2.4. 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 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.

3. Bushfire Hazard Assessment

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;
- Review of LiDAR point cloud data (NSW LPI);
- Reference to NSW State Vegetation Type, NSW Department of Planning, Industry and Environment 2022 (**Figure 6**); and
- Site inspection completed by Stuart Greville on 18 November 2021 and 29 March 2023.

In accordance with PBP 2019, an assessment of the existing vegetation over a distance of 140m in all directions from the site was undertaken. Vegetation that may be considered a bushfire hazard was identified to the north-east and west of the proposed development and identified as a *forest*, namely *Hunter Macleay Dry Sclerophyll Forest* according to both PBP 2019 and Keith vegetation classifications. The findings of the site inspection were compared to the NSW State Vegetation Type mapping (**Figure 6**) and any inconsistencies between the mapping sources were quantified during the site inspection and are discussed within this assessment.

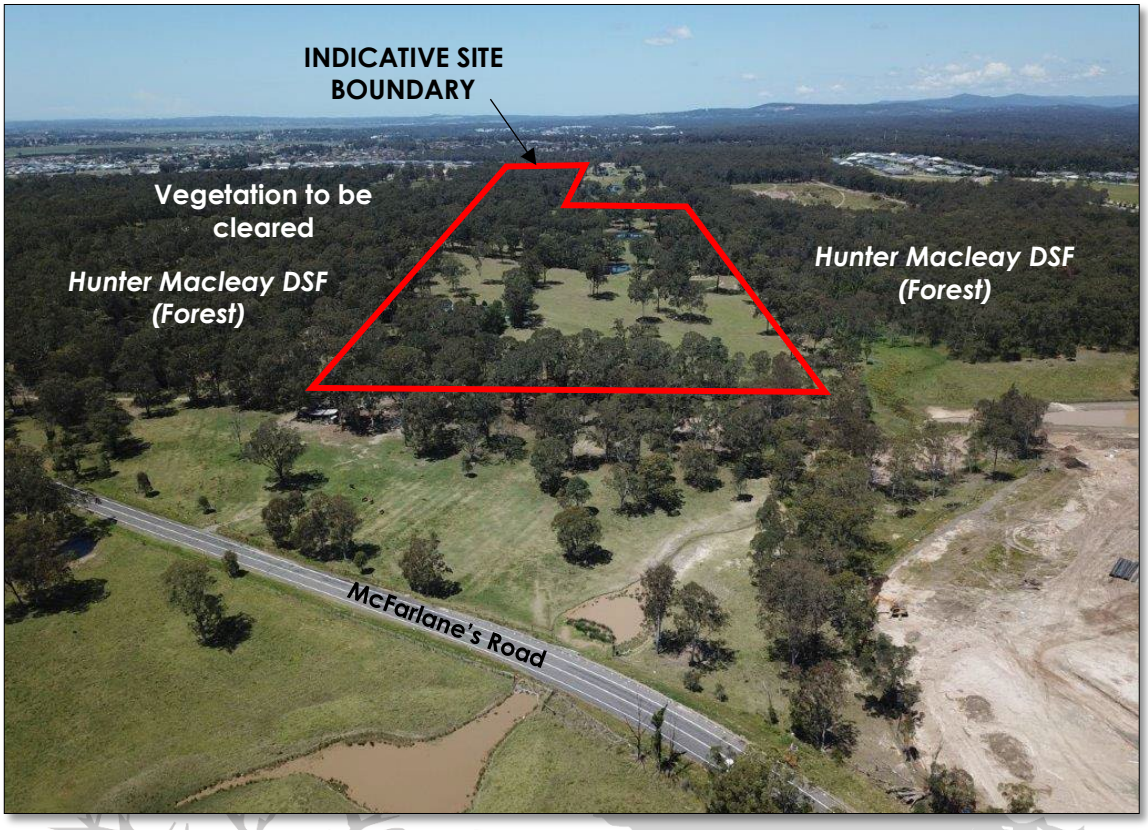

Plate 1: Subject site looking south across Thornton North Urban Release Area

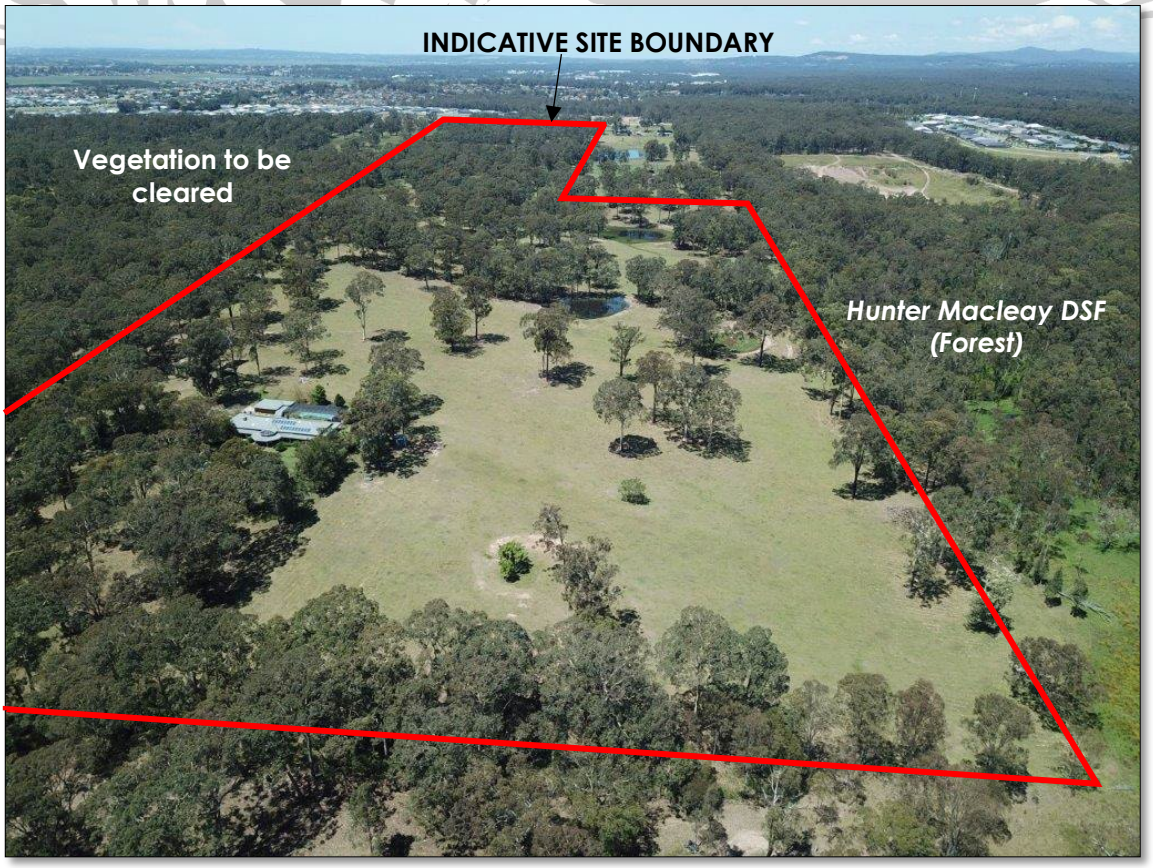

Plate 2: Subject site currently adjoins remnant vegetation – looking south

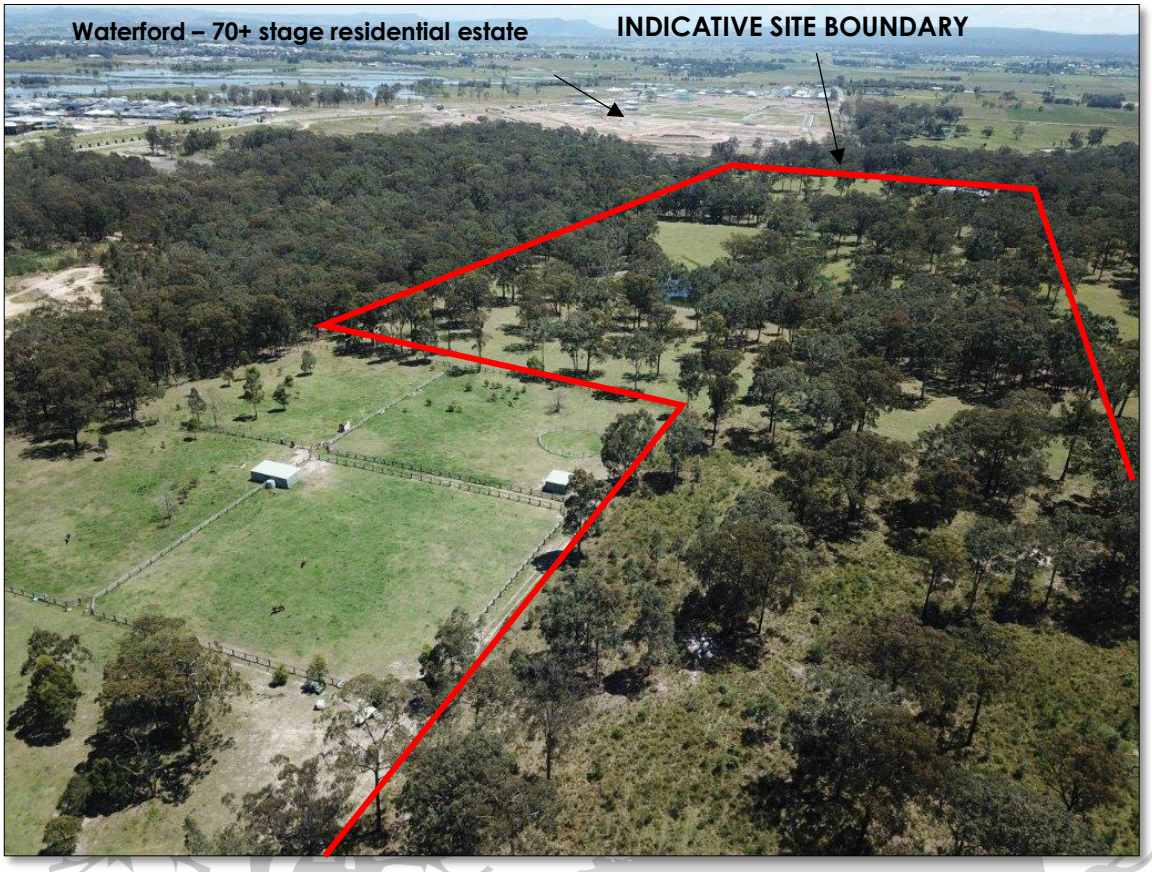

Plate 3: Looking north west across site and adjoining grassland towards Waterford County

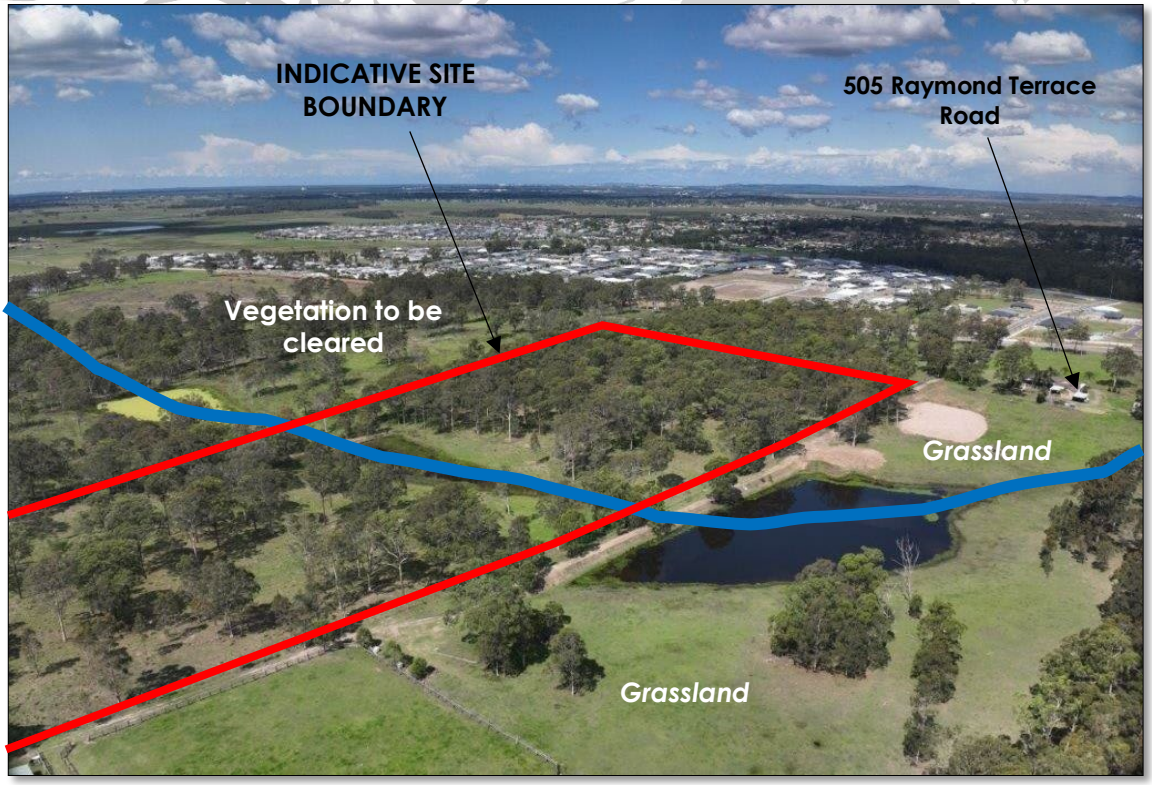

Plate 4: Looking south-east over 505 Raymond Terrace Road across to subject site

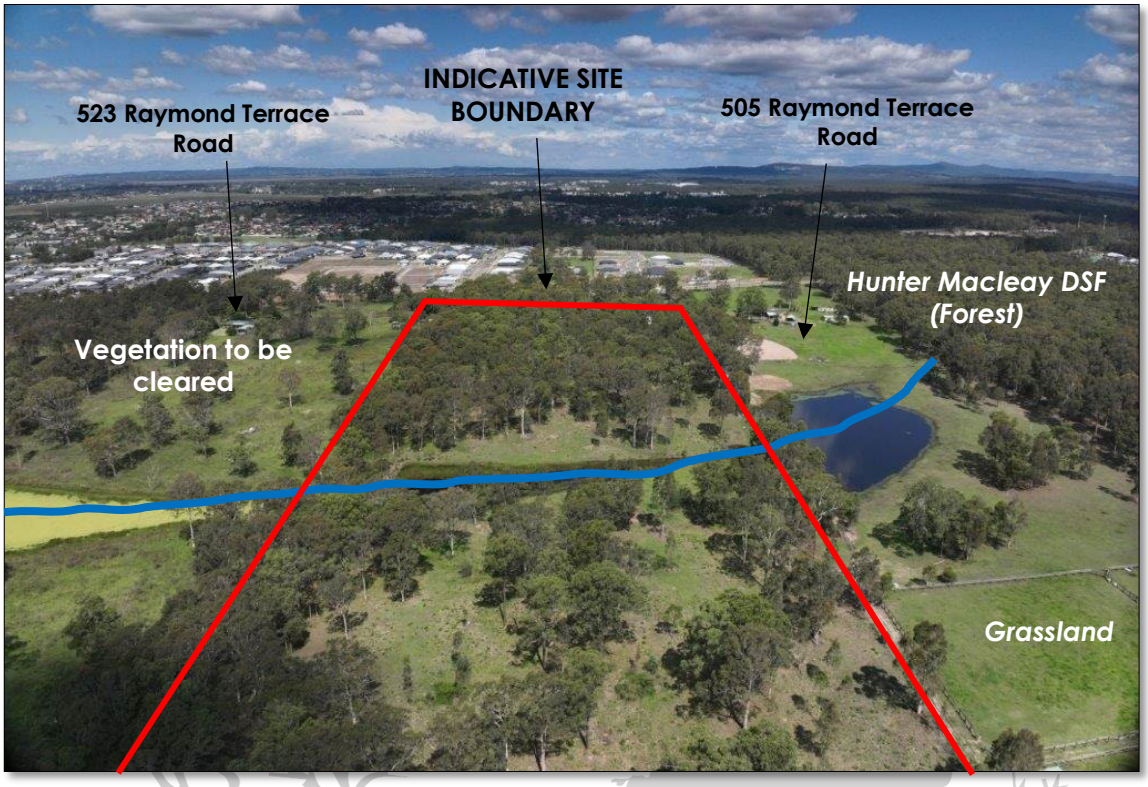

Plate 5: Subject site is covered by an open grassy forest and adjoins 2 cleared properties

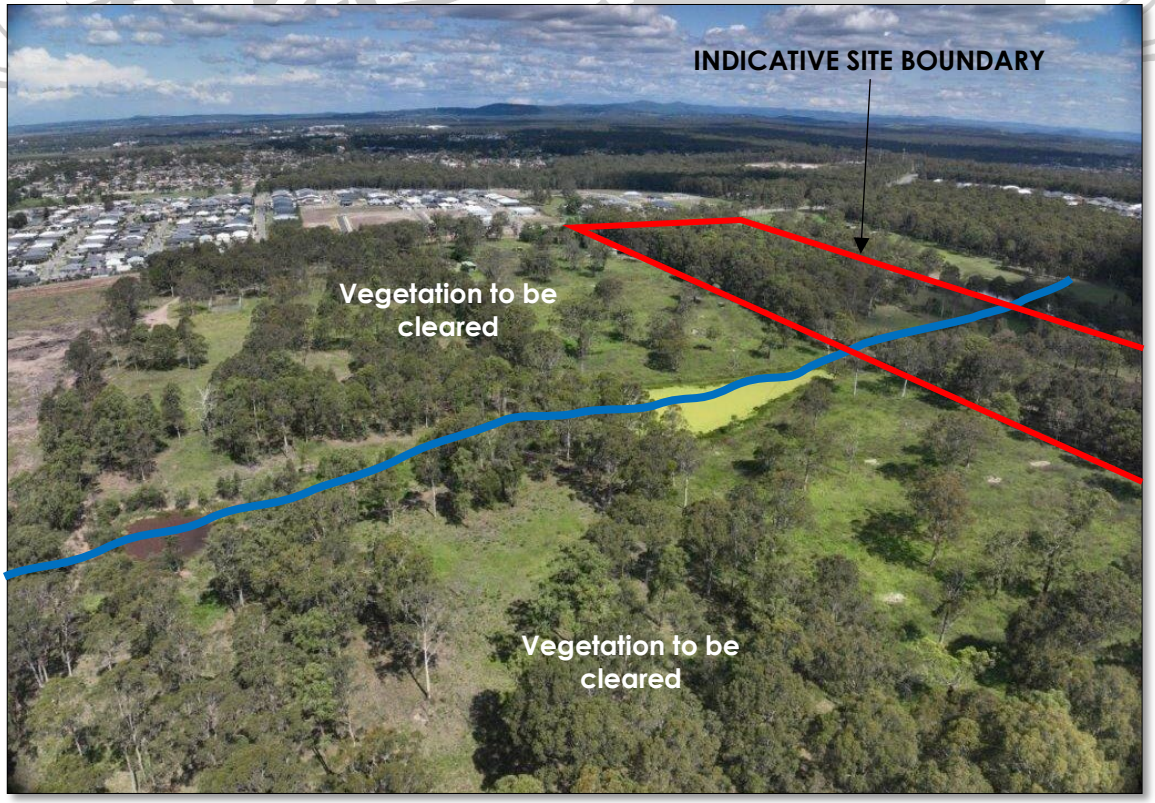

Plate 6: All vegetation outside riparian corridor on 523 Raymond Terrace Road will be removed

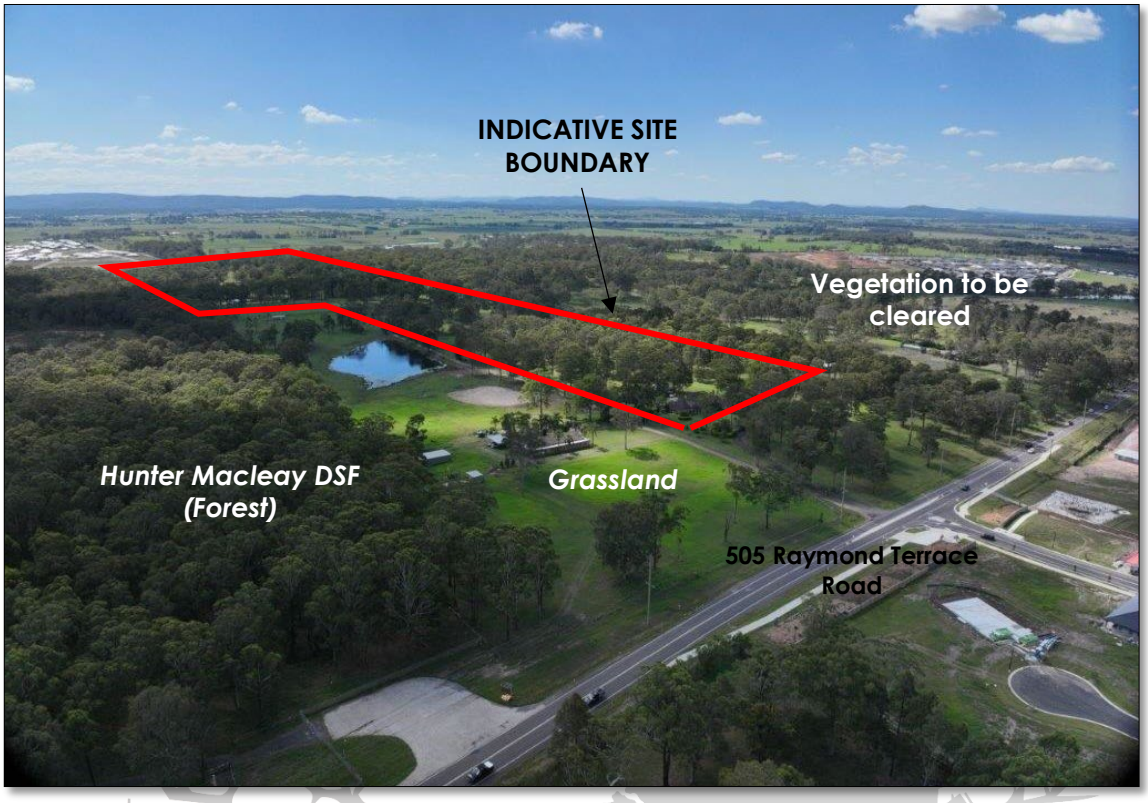

Plate 7: Looking northeast across Raymond Terrace Road towards 505 and 507 Raymond Terrace Road

Plate 8: Typical grassy forest northeast of the site (T3)

Plate 9: T4 looking southeast into 523 Raymond Terrace Road (subject to DA)

Plate 10: Looking southwest across T10 (forest) into land zoned C2 Environmental Conservation

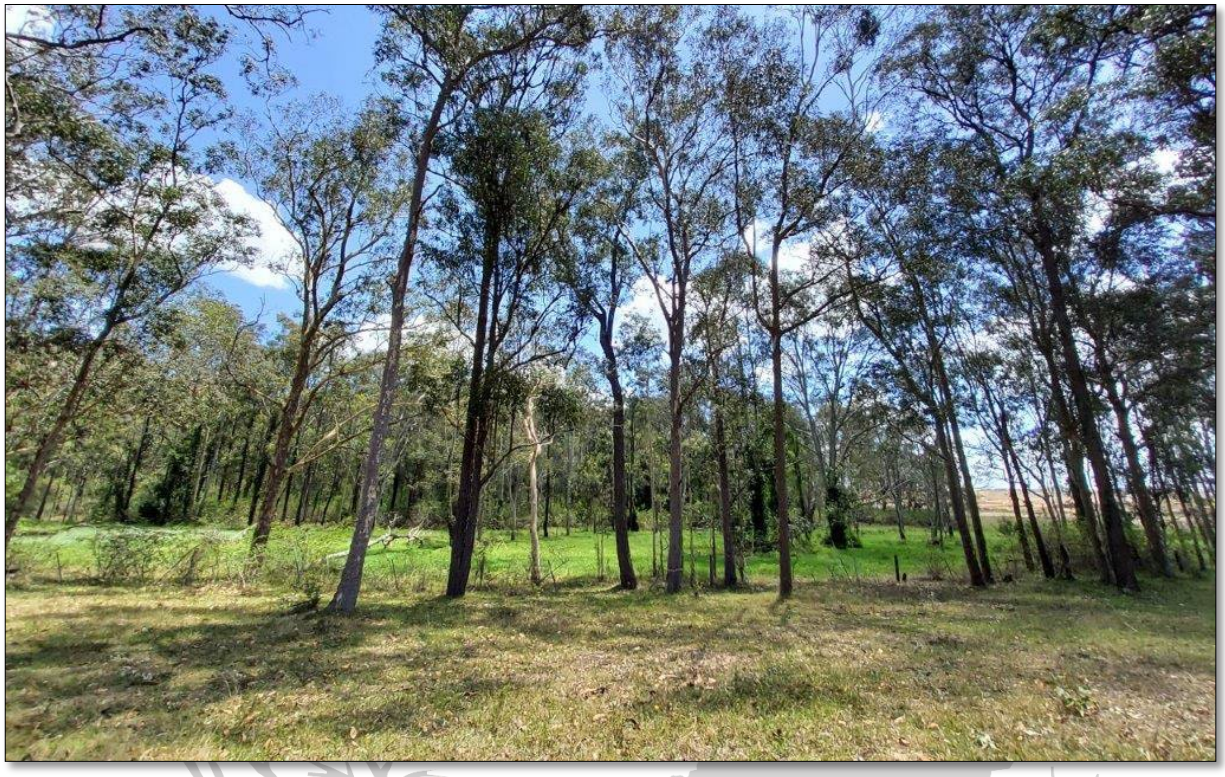

Plate 11: T11 transitions through forest into wetland and onto managed lands

Plate 12: Proposed development provides a new road connection to the adjoining residential development (between T1 and T11)

BUSHFIRE PLANNING AUSTRALIA

Source:	Cadastral Boundary: NSW Department of Finance, Services and Innovation 2022 Aerial photo: NearMap 03/01/2023 Vegetation: © State Government of NSW and Department of Planning and Environment 2022
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File:	File: McFarlanesRd-Fig3-Vegetation-NSW-SVT-230301 Date: 1/03/2023

0 50 100 150 200
Meters

A3 Scale: 1:5,000

Coordinate System: GDA 1994 MGA Zone 56

Project: 173 McFarlanes Road, Chisholm

Figure 6:

NSW State Vegetation Type

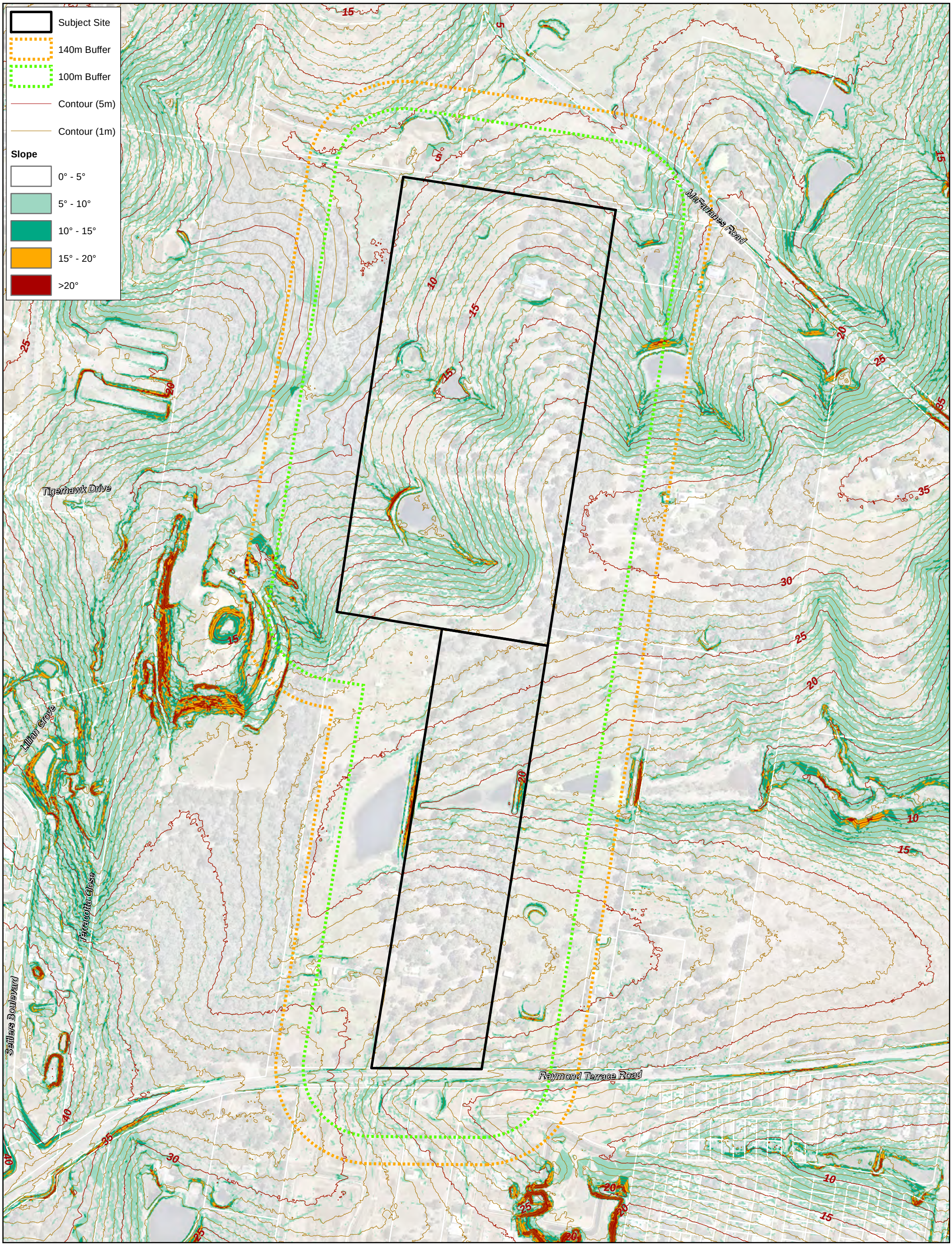
3.2. Slope Assessment

The slope assessment was undertaken as follows:

- Review of LiDAR point cloud data - including DEM (NSW LPI),
- Detail survey of existing contours; and
- Site inspection by Stuart Greville (Bushfire Planning Australia) on 18 November 2021 and 28 March 2023.

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.

The effective slope in all directions is shown in **Figure 7, Figure 8** and **Table 2.**



BUSHFIRE PLANNING AUSTRALIA	Source:	Cadastral Boundary: NSW Department of Finance, Services and Innovation 2021 Aerial Photo: Nearmap 03/01/2023 Surface analysis based on Newcastle 1 metre Resolution Digital Elevation Model © Department Finance, Services and Innovation 2012	Project: 173 McFarlanes Road, Chisholm
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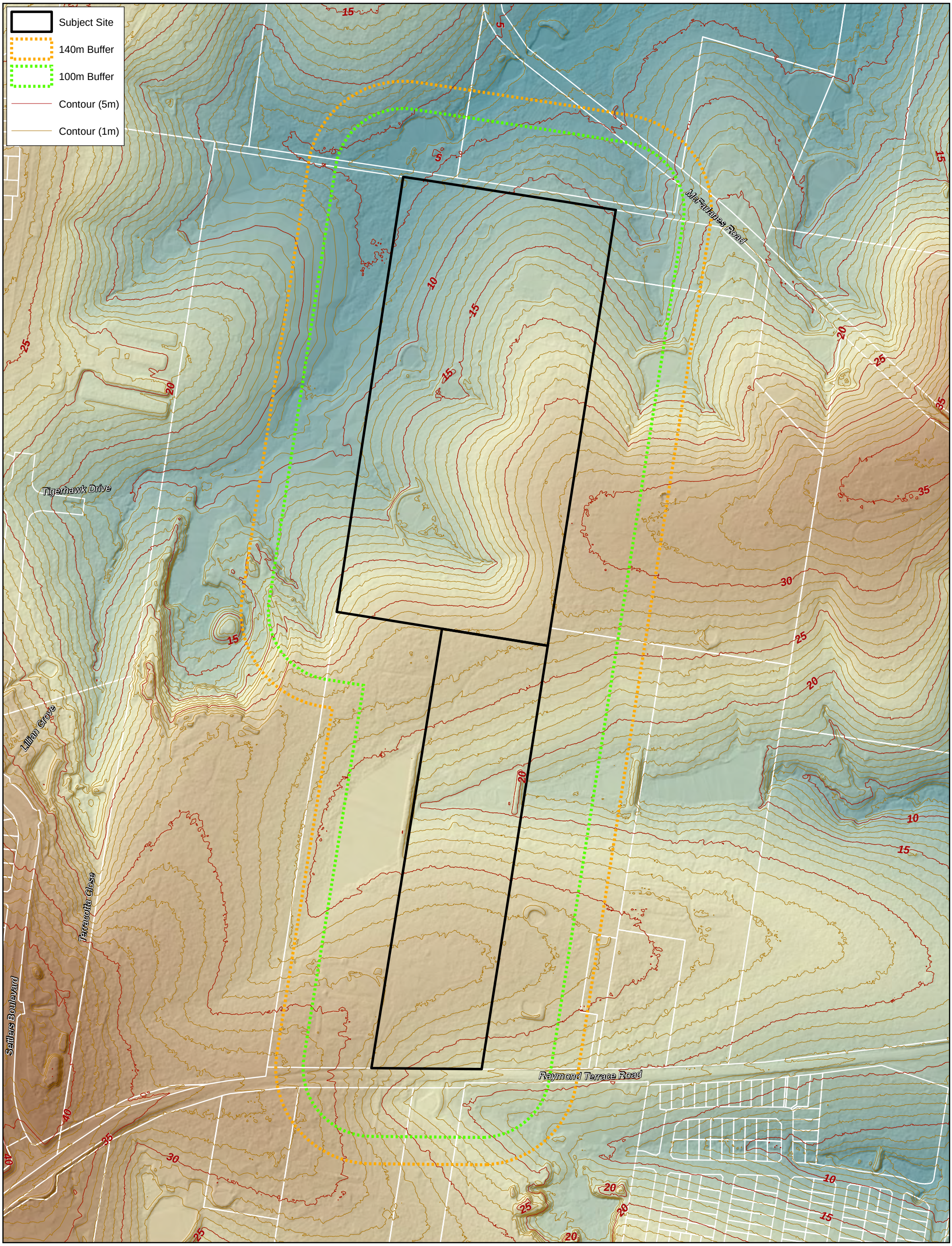
		N 0 50 100 150 200 Meters A3 Scale: 1:5,000 Coordinate System: GDA 1994 MGA Zone 56	

Figure 7:

Slope Analysis: LiDAR



BUSHFIRE PLANNING AUSTRALIA	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	Project: 173 McFarlanes Road, Chisholm
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	File:	File: McFarlanesRd-Fig4-DEM-230301 Date: 1/03/2023	

N

0 50 100 150 200

Meters

A3 Scale: 1:5,000

Coordinate System: GDA 1994 MGA Zone 56

Figure 8:

Digital Terrain Model

3.3. Results

The site inspection formed part of a reliability assessment to determine whether the site's mapped characteristics were consistent with the actual slope and vegetation characteristics observed on the site.

It was confirmed during the site inspection, the predominant vegetation classification within and surrounding the site to the north, east and west is a *forest;* specifically, *Hunter Macleay Dry Sclerophyll Forest* vegetation formation in accordance with the descriptions contained in Keith. The primary bushfire hazard is the forest vegetation located to within and beyond 140m to the west of the northern portion (Lot 32) of the proposed development.

Managed land also exists to the west within 140m of the southern portion (Lot 31) of the proposed development site and north of Raymond Terrace Road, before transitioning to the *forest* vegetation and primary bushfire hazard.

Whilst acknowledging there are multiple development applications lodged (or being prepared) with Maitland City Council seeking approval for future development of all adjoining lots to the east and south of the proposed site, until these future developments are approved and the vegetation is cleared, it remains the primary bushfire hazard and is therefore assessed for the purposes of this BAR.

The vegetation that exists to the south, south-east and south-west of the site is deemed low-threat vegetation as it is part of managed land surrounding the adjoining rural residential dwellings or cleared land for an approved future residential subdivision (southern side of Raymond Terrace Road). This type of vegetation is not required to be considered for the purposes of PBP 2019.

As part of the proposed development, vegetation will also exist on site as part of the proposed Council dedicated reserve located in the mid-section of the site. Vegetation will also be regenerated as part of the drainage reserve located in place of the existing dam which will consist of *Forested Wetlands* along the drainage batters and has been assessed accordingly.

The final bushfire hazard assessment defining vegetation classifications and effective slope is shown in **Table 2** and **Figure 9.**

Table 2: Slope and Vegetation Assessment Results

Transect	Vegetation Description	Vegetation Classification (PBP 2019)	Slope
T1 North	Managed land within the proposed development transitioning to forested wetland vegetation immediately located external to the site's northern boundary	*Forested Wetland* (Coastal Floodplain Wetland)	2.2° Downslope
T2 North	Forest vegetation from the site's northern boundary	*Forest* (Hunter Macleay Dry Sclerophyll Forest)	3.3° Downslope
T3 East	Forest vegetation from the site's eastern boundary	*Forest* (Hunter Macleay Dry Sclerophyll Forest)	4.6° Downslope
T4 East	Managed land on the eastern neighbouring lot assessed as a grassland - within future development site	*Grassland*	-0.5° Upslope
T5 On-site	An existing dam within the development site to be revegetated as forested wetland	*Forested Wetland* (Coastal Floodplain Wetland)	-0.2° Upslope
T6 On-site	An existing dam within the development site to be revegetated as forested wetland	*Forested Wetland* (Coastal Floodplain Wetland)	-2.3° Upslope
T7 West	Managed land on the western neighbouring lot assessed as a grassland - within future development site	*Grassland*	-2.3° Upslope
T8 West	Managed land on the western neighbouring lot assessed as a grassland - within future development site	*Grassland*	-0.2° Upslope
T9 West	Forest vegetation from the site's western boundary	*Forest* (Hunter Macleay Dry Sclerophyll Forest)	3.7° Downslope
T10 West	Forest vegetation from the site's western boundary	*Forest* (Hunter Macleay Dry Sclerophyll Forest)	2.0° Downslope
T11 West	Forest vegetation from the site's western boundary	*Forest* (Hunter Macleay Dry Sclerophyll Forest)	0.2° Downslope
T12 West	Managed land on the western neighbouring lot assessed as a grassland - within future development site	*Grassland*	1.7° Downslope
T13 South	Managed land within the subject site for future development under a separate consent	Excluded (Managed Land)	0.3° Downslope
T14 South-east	Managed land on the southern side of Raymond Terrace Road	Excluded (Managed Land)	2.6° Downslope
T15 East	Managed land on the eastern neighbouring lot assessed as a grassland	*Grassland*	1.5° Downslope

BUSHFIRE PLANNING AUSTRALIA	Source:	Cadastral Boundary: NSW Department of Finance, Services and Innovation 2021 Aerial Photo: Nearmap 03/01/2023 Vegetation: © State Government of NSW and Department of Planning and Environment 2022 Surface analysis based on Newcastle 1 metre Resolution Digital Elevation Model © Department Finance, Services and Innovation 2012	Project: 173 McFarlanes Road, Chisholm Job no: 2179
	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: 2179-McFarlanesRd-Fig6-SlopeVeg-230519 Date: 19/05/2023	

N

0 50 100 150

Meters

A3 Scale: 1:4,500

Coordinate System: GDA 1994 MGA Zone 56

Figure 9:

Slope & Vegetation Assessment

3.4. Significant Environmental Features

There are no known environmental features of significance within the development footprint or the balance of the site.

3.5. Threatened Species, populations or ecological communities

The area of the site to be affected by the proposed development has been identified to minimise impact on any threatened species, population or EEC. All bushfire mitigation measures; including APZs have considered the existing and potential biodiversity values to minimise 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 in or near the subject site within a 50 metre buffer.

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 BAR 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 accommodated 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 Bushfire Safety Authority (BFSA) it is requested the RFS endorse the included **Subdivision BAL Plan**.

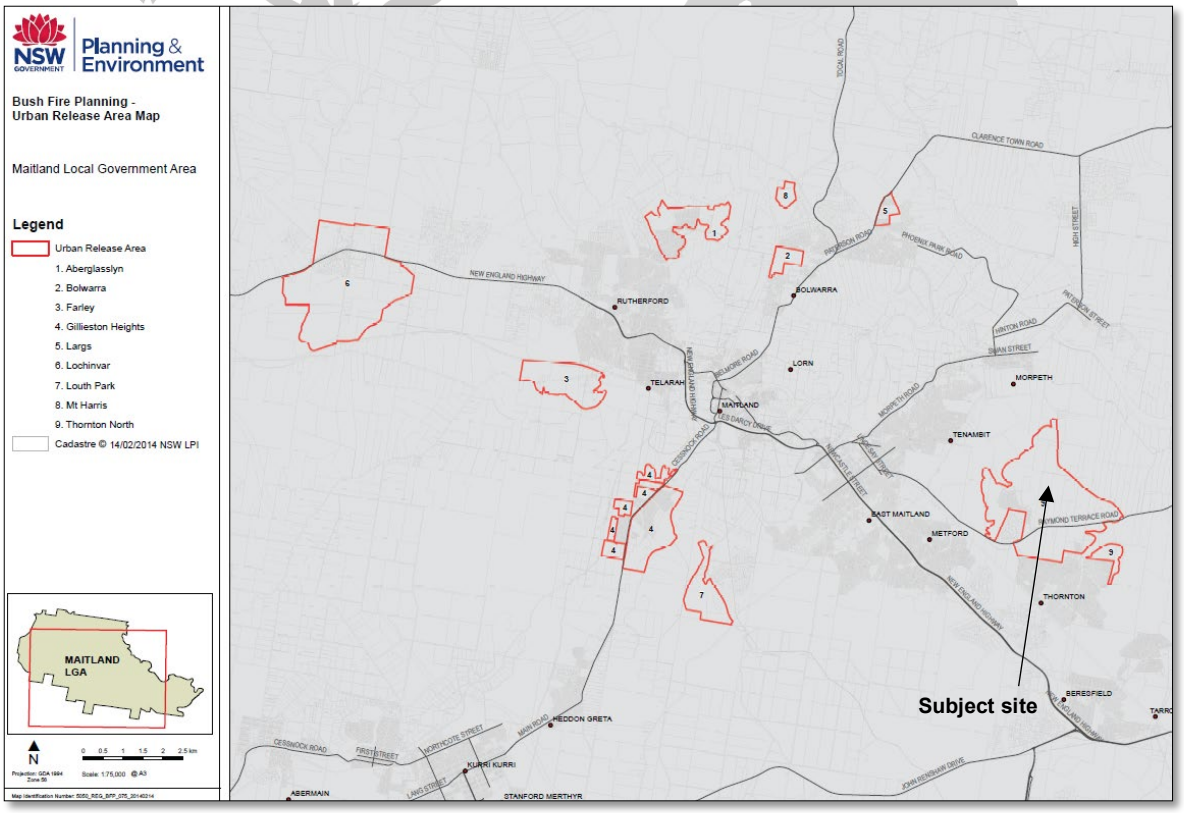


Figure 10: Bushfire Planning - Urban Release Area Map (Maitland LGA)

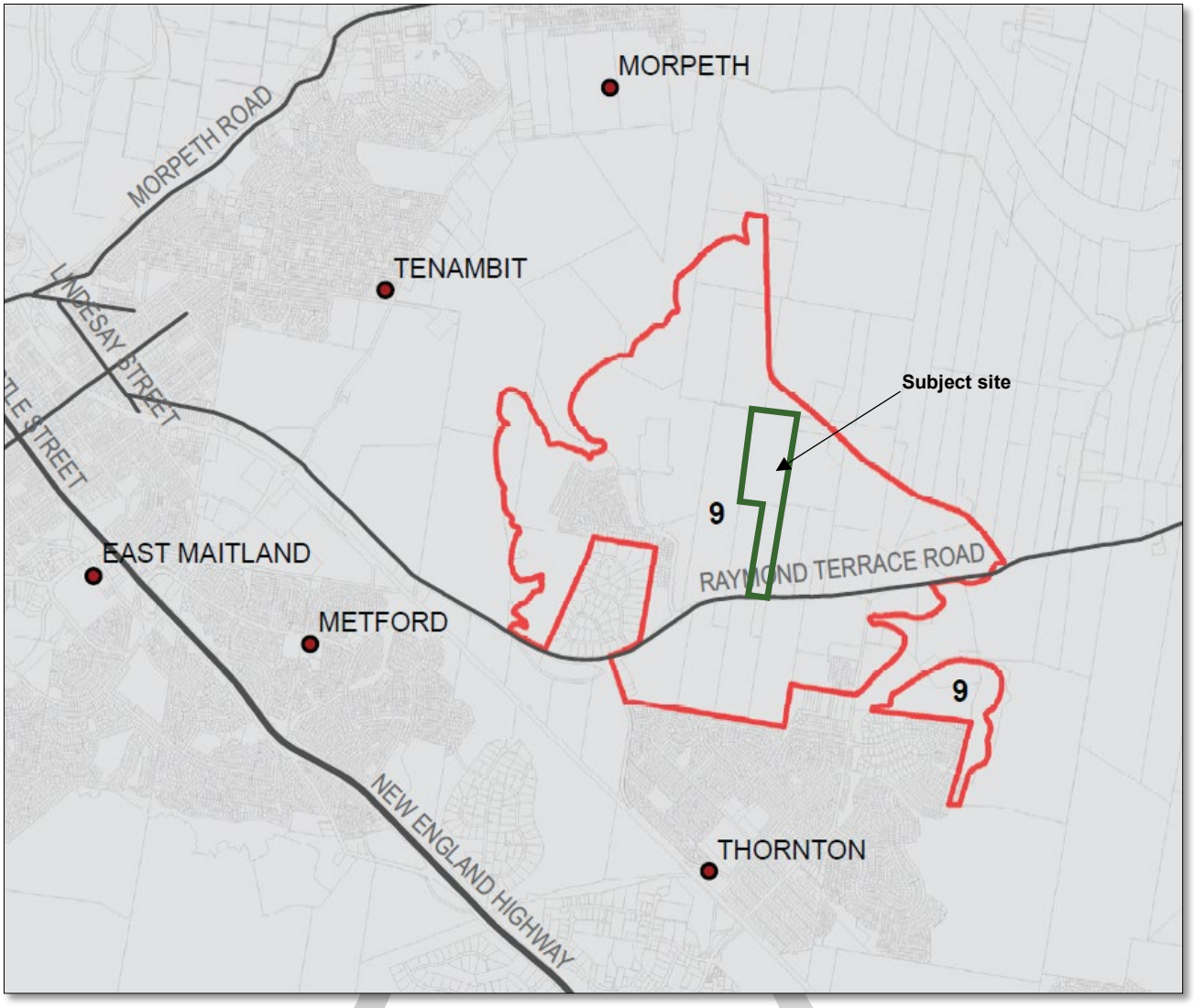


Figure 11: Bushfire Planning - Urban Release Area: Thornton North

4. Bushfire Protection Measures

This BAR has adopted the methodology to determine the appropriate Bushfire Protection Measures (BPMs) detailed in PBP 2019. As part of the BAR, the recommended BPMs demonstrate the aims and objectives of PBP 2019 have been satisified; including the matters considered by the RFS necessary to protect persons, property and the environment from the danger that may arise from a bushfire.

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).

An APZ can include the following:

- Lawns;
- Discontinuous gardens;
- Swimming pools;
- Roads, driveways and managed verges;
- Unattached non-combustible garages with suitable separation from the dwelling;
- Open space / parkland; and
- Car parking.

The presence of a few shrubs or trees in the APZ is acceptable provided that they:

- Do not touch or overhang any buildings;
- Are well spread out and do not form a continuous canopy;
- Are not species that retain dead material or deposit excessive quantities of ground fuel in a short period or in a danger period; and
- Are located far enough away from any dwelling so that they will not ignite the dwelling by direct flame contact or radiant heat emission.

Woodpiles, wooden sheds, combustible material storage areas, large areas / quantities of garden mulch, stacked flammable building materials etc. are not recommended in the APZ.

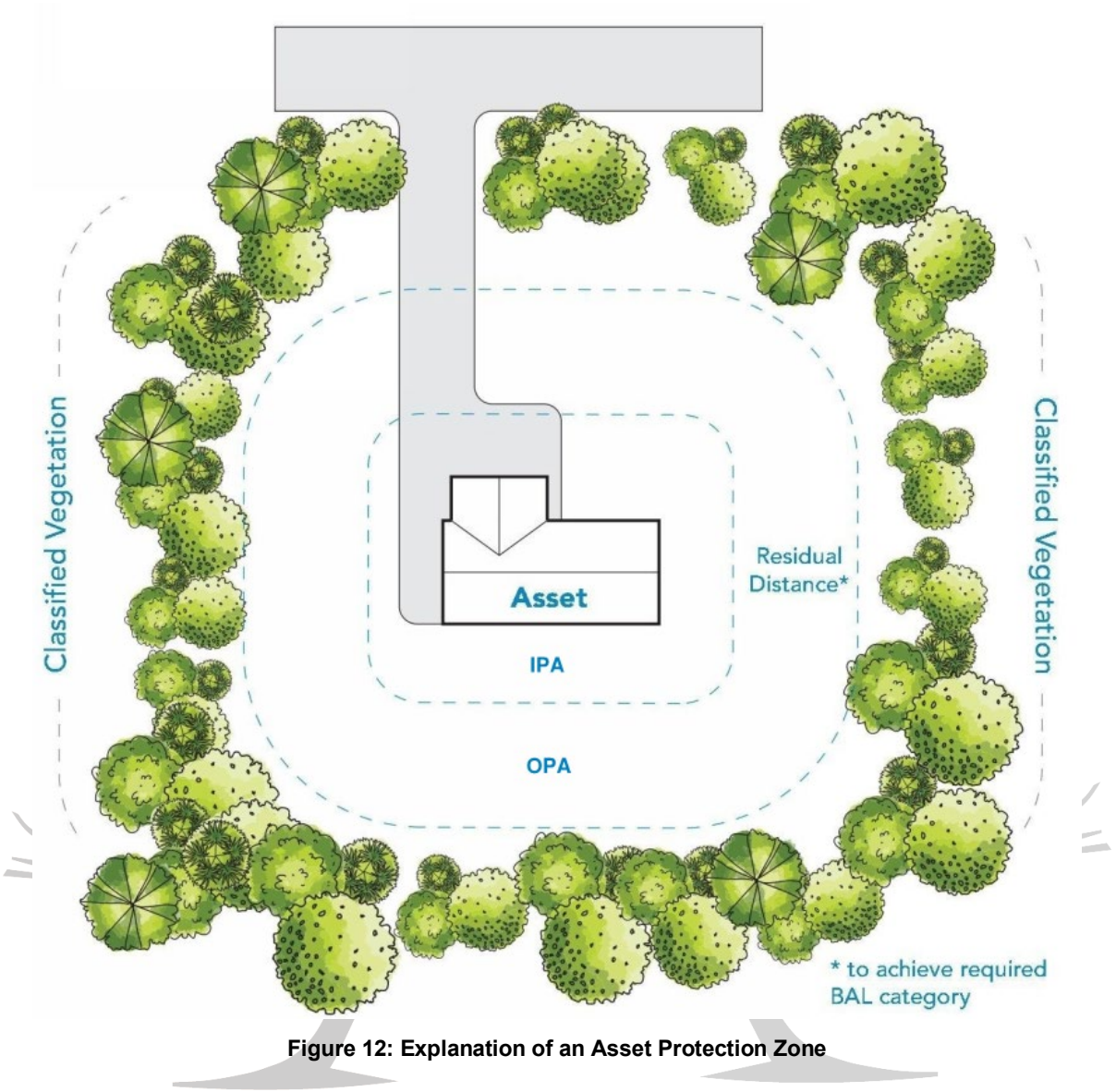


Figure 12: Explanation of an Asset Protection Zone

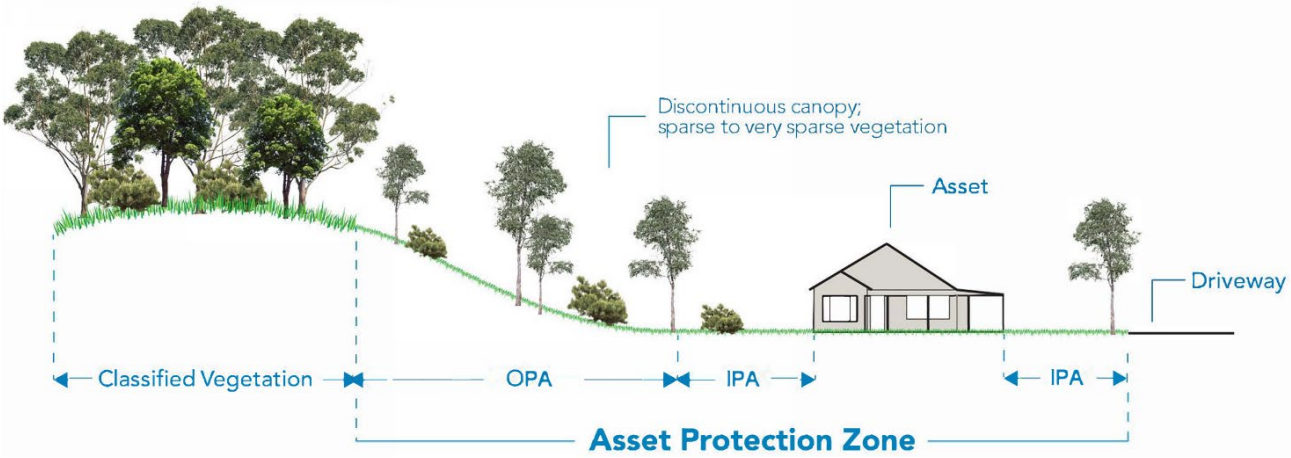


Figure 13: Asset Protection Zone profile

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-satisify 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-T15). To ensure the APZs achieve the intent of Section 5.3 of PBP 2019, the APZs have been determined to ensure all lots are able to accomomodate a dwelling that will not be exposed to radiant heat levels exceeding 29kW/m^2. The NBC Bushfire Attack Assessor report detailing the inputs used is contained in **Appendix C**.

Refer to **Table 3** for the recommended APZs. **Figure 18** and **Figure 19** presents the APZs for the proposed development based on the existing bushfire hazard, noting there are both temporary and permanent APZs based on existing and future adjoining developments. The permananent APZs are required on the northern and southern sides of the environmental corridor. The temporary APZs are required along both sides of the environmental corridor and the eastern and western boundaries of both the northern and southern development sites. Additionally a temporary APZ is also required along the northern boundary of the northern development site, until adjoining developments are completed. It is noted the proposed development cannot be completed until public road access is provided following completion of the residential subdivision on the eastern boundary; being 523 Raymond Terrace Road, Chisholm.

Refer to **Table 3** and **Figure 18** and **Figure 19** for the required and recommended APZs for each transect.

Table 3: Required APZ setback - FDI @ 100

Transect	Vegetation Classification (PBP 2019)	Slope	PBP 2019 (Table A1.12.2)	Recommended APZ (Method 2 <29kW/m^2)
T1 North	*Forested Wetland* (Coastal Floodplain Wetland)	2.2° Downslope	12m	11m
T2 North	*Forest* (Hunter Macleay Dry Sclerophyll Forest)	3.3° Downslope	29m	19m
T3 East	*Forest* (Hunter Macleay Dry Sclerophyll Forest)	4.6° Downslope	29m	20m
T4 East	*Grassland*	-0.5° Upslope	10m	10m
T5 On-site	*Forested Wetland* (Coastal Floodplain Wetland)	-0.2° Upslope	10m	10m
T6 On-site	*Forested Wetland* (Coastal Floodplain Wetland)	-2.3° Upslope	10m	9m
T7 West	*Grassland*	-2.3° Upslope	10m	10m
T8 West	*Grassland*	-0.2° Upslope	10m	10m
T9 West	*Forest* (Hunter Macleay Dry Sclerophyll Forest)	3.7° Downslope	29m	19m
T10 West	*Forest* (Hunter Macleay Dry Sclerophyll Forest)	2.0° Downslope	29m	18m
T11 West	*Forest* (Hunter Macleay Dry Sclerophyll Forest)	0.2°* Downslope	24m	16m
T12 West	*Grassland*	1.7° Downslope	12m	11m
T13 South	Excluded (Managed Land)	0.3° Downslope	N/A	N/A
T14 South-east	Excluded (Managed Land)	2.6° Downslope	N/A	N/A
T15 East	*Grassland*	1.5° Downslope	12m	11m

* T11 slope has been assessed as 'flat' given 0.2 downslope is considered marginal and associated results are negligible.

The recommended APZs detailed in **Table 3** are considered to be acceptable in this instance and satisfies the Performance Criteria for APZs outlined in Table 5.3a of PBP 2019.

4.2. 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 for all future dwellings.

The proposed road network consists of perimeter and non-perimeter roads which have been designed in accordance with Table 5.3b of PBP 2019. Refer to **Appendix A** for the development plans indicating the proposed access arrangements. Ten (10) new road connections are provided offering public road connections from the northern precinct (north of the riparian corridor) into the adjoining residential developments. Four (4) public road connections are proposed to be constructed to connect the southern precinct into the adjoining future road network.

All roads have been designed either in accordance with or exceed the minimum required for an Acceptable Solution under PBP 2019 including minimum 10.5m (up to 12.0m) wide road carriageways for all perimeter roads and 8m wide non-perimeter roads. **Figure 14** indicates the connectivity between the internal road network and the surrounding Thornton North Urban Release Area – within which the subject site is entirely surrounded by.

Upon completion of the surrounding subdivisions, the remaining bushfire risk will be contained to the vegetation to be retained within the land to the west zoned E2 Environmental Conservation and a smaller area of vegetation to be retained to the northeast. Both of these bushfire hazards ha e an area greater than 1 hectares, but are contained by surrounding residential development and are not connected to any other large areas of bushfire hazardous vegetation. A marginal bushfire hazard is confined to the narrow riparian corridor; which is less than 40m wide. Operational firefighting can occur from both sides of the 40m wide vegetated riparian corridor (*forested wetland*).

All new perimeter roads and non-perimeter roads are required to be designed in accordance with Maitland City Council development control plan and engineering specifications. The proposed 8m wide internal local streets (non-perimeter roads) are considered sufficiently wide enough to accommodate parking for light vehicles on both sides of road, outside of the primary vehicle carriageway. It is noted the standard for on-street parking required by Australian Standard *AS2890.5:2020 Parking facilities On-street parking* for roads with a speed limit of 50km/hr or less is to be between 2.0m and 2.3m. It is also noted that a RFS Category 1 Firefighting vehicle is 2.4m wide. Furthermore, applying the option of permitting short constrictions where the width of the access road may be reduced for sections less than 30m, an 8m wide road is considered wide enough to provide a continuous unobstructed carriageway with parking on both sides of the road. The combination of double width driveways along a typical residential local street will prevent a continuous line of parked cars on both sides of the local street. It is also unlikely that on-street parking demand in the locality would result in vehicles parked along both sides of non-perimeter (or perimeter) roads.

The bushfire hazards to the east and west will both be completely contained and separated by perimeter roads from each adjoining residential development. Accordingly, direct access and defendable space is available to wherever a bushfire is spreading. Furthermore, the network of public roads throughout the site provide road connections in every available direction. Accordingly, where ever a bushfire may occur, multiple evacuation routes are available for use be residents evacuating the area.

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. Accordingly, the access requirements can be achieved by meeting the Performance Criteria under Table 5.3b of PBP 2019.

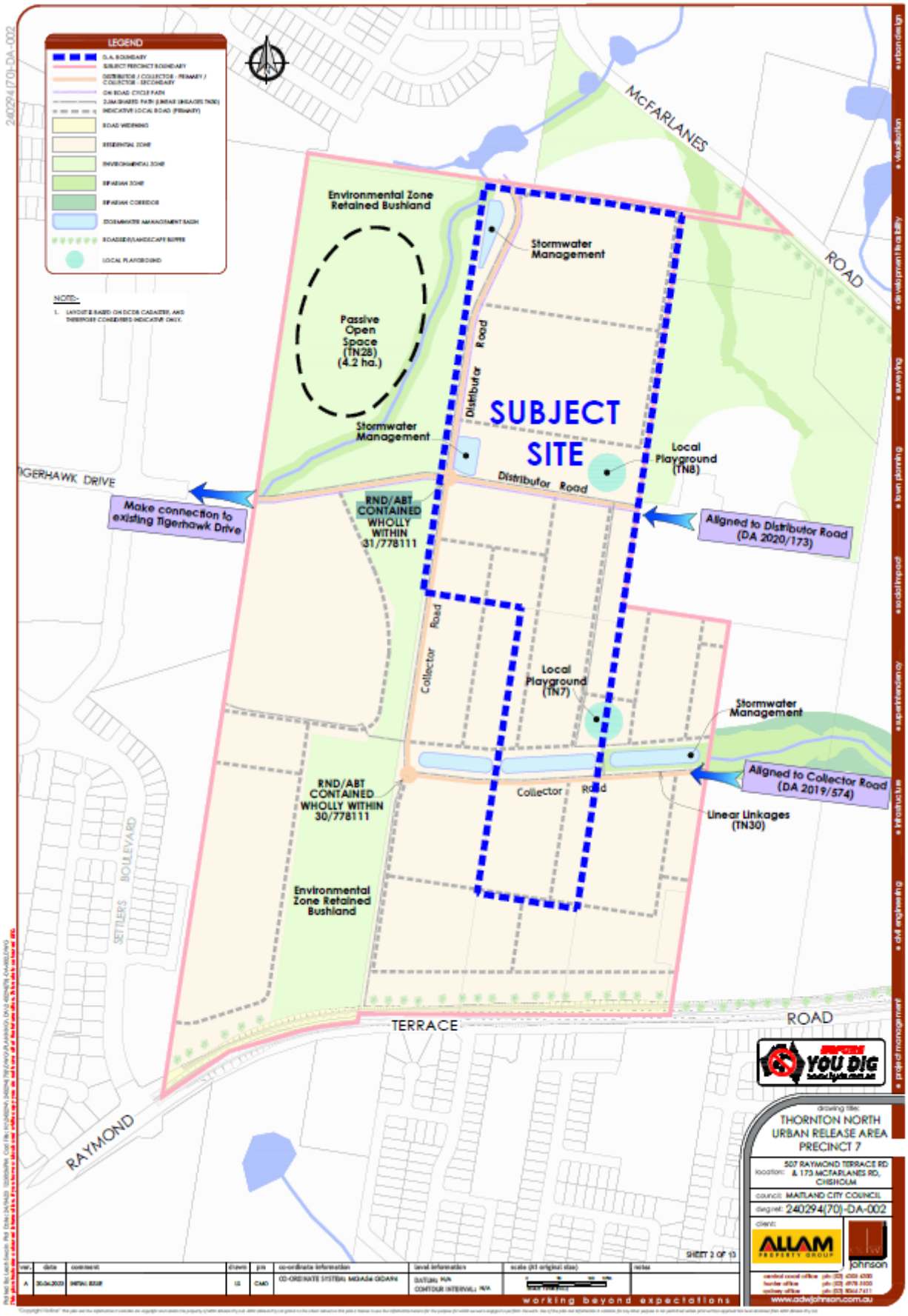


Figure 14: Thornton North URA – road network

4.3. Services - water, electricity and gas

4.3.1. Water

A reticulated water supply is able to be connected to both new lots in accordance with Table 5.3c of PBP 2019.

4.3.2. Electricity

Any new electricity services will be supplied and located underground.

4.3.3. Gas

Any reticulated or bottled gas will be installed and maintained according to the requirements of the relevant authorities and AS 1596-2002. It is expected that the location of gas services will not lead to ignition of surrounding bushland or the fabric of buildings.

4.5. Emergency Services

There is a NSW Rural Fire Brigade is located at Kooralbyn Street, Thornton within 4.3km (approximately 5 minutes from the site (**Figure 15**). A second NSW Fire and Rescue Service Fire Station located at 1 Chelmsford Drive, Metford within 5.9km (approximately 8 minutes) from the site (**Figure 16**).

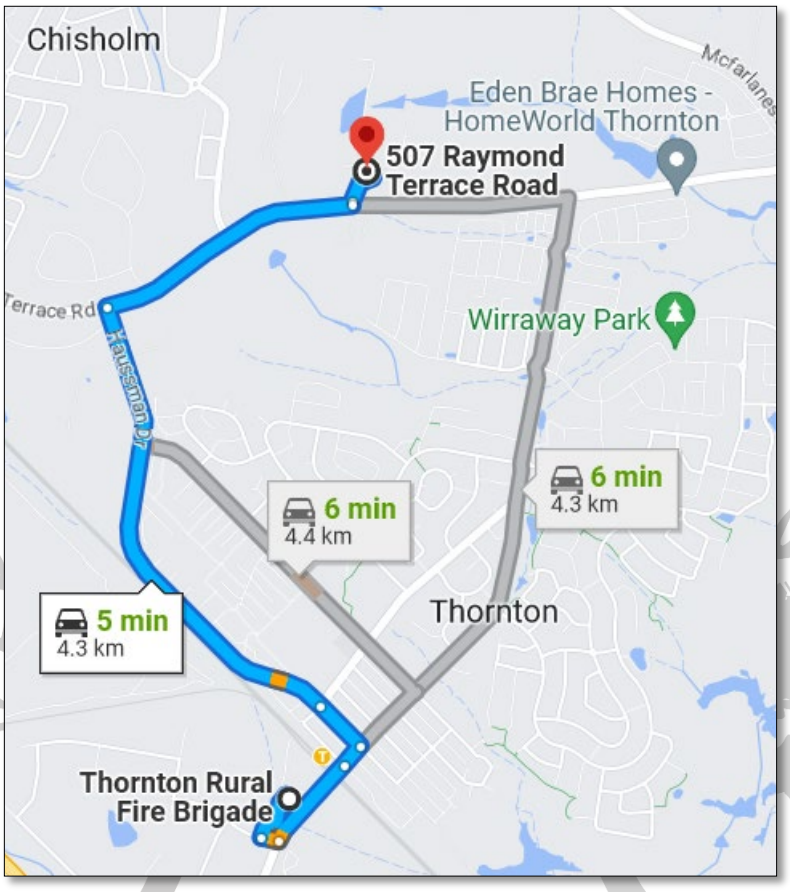


Figure 15: NSW Rural Fire Brigade - Thornton

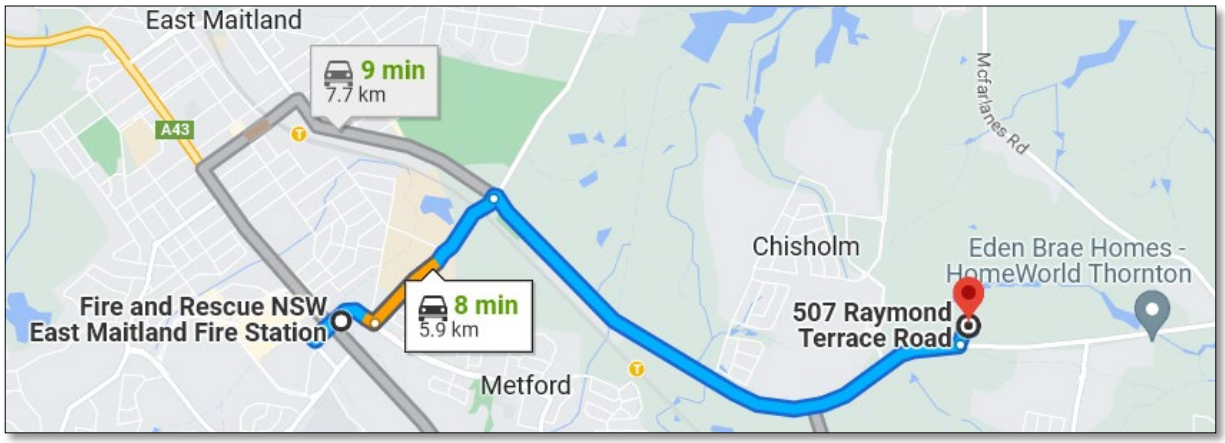


Figure 16: NSW Fire & Rescue - East Maitland

4.6. 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, any 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 GFDI = *100*;
- Flame temperature = *1090K*;
- Slope = *variable*;
- Vegetation classification = *forest*; and
- Building location.

The greatest bushfire hazard was found to the west of the site being a *forest*.

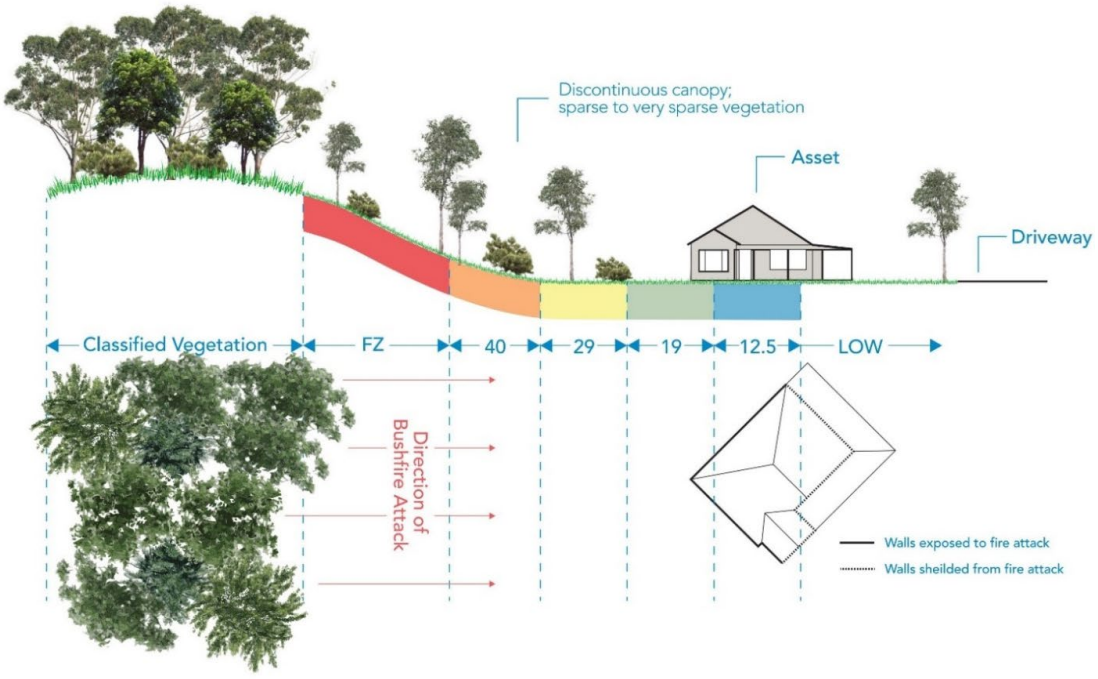


Figure 17: BAL example

The existing bushfire hazard was found to the west of the proposed development site and identified as a *forest (Hunter Macleay Dry Sclerophyll Forest)*. Vegetation to the east is considered a temporary hazard as all adjoining lots are in the process of being developed, however, until the vegetation is cleared it is considered a hazard it requires temporary BALs and is assessed accordingly (**Figure 18**). Vegetation to the west will therefore remain the closest and primary bushfire hazard which requires permanent BALs and is assessed accordingly (**Figure 19**).

The proposed drainage reserve corridor separating the northern and southern development sites will become the primary bushfire hazard once the neighbouring developments commence. The drainage reserve will consist of a planting schedule commensurate with *Forested Wetlands* and *Freshwater Wetlands*, requiring permanent BALs and assessed accordingly (**Figure 19**).

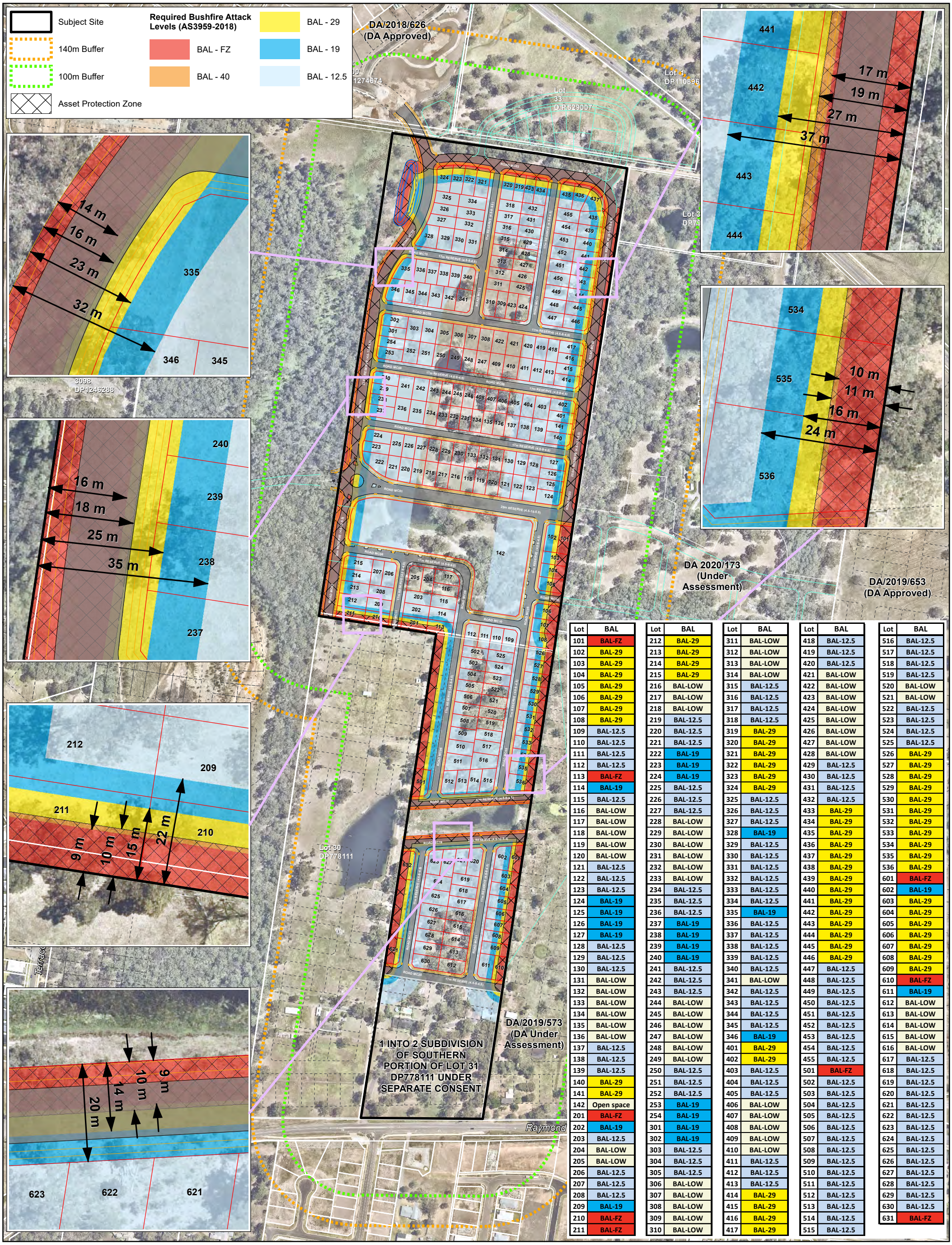
The recommended BALs are shown in **Table 4** and **Figure 18** and **Figure 19**.

Table 4: Required Bushfire Attack Level

Transect	Vegetation Classification (PBP 2019)	Slope	Recommended APZ (<29kW/m²)	Distance from Hazard	Bushfire Attack Level (BAL)
T1 North	*Forested Wetland (Coastal Floodplain Wetlands)*	2.2° Downslope	11m	0m-<10m	BAL-FZ
				10m-<11m	BAL-40
				11m-<16m	BAL-29
				16m-<23m	BAL-19
				23m-<100m	BAL-12.5
T2 North	*Forest (Hunter Macleay DSF)*	3.3° Downslope	19m	0m-<17m	BAL-FZ
				17m-<19m	BAL-40
				19m-<27m	BAL-29
				27m-<37m	BAL-19
				37m-<100m	BAL-12.5
T3 East	*Forest (Hunter Macleay DSF)*	4.6° Downslope	20m	0m-<18m	BAL-FZ
				18m-<20m	BAL-40
				20m-<28m	BAL-29
				28m-<39m	BAL-19
				39m-<100m	BAL-12.5
T4 East	*Grassland*	-0.5° Upslope	10m	0m-<9m	BAL-FZ
				9m-<10m	BAL-40
				10m-<15m	BAL-29
				15m-<22m	BAL-19
				22m-<50m	BAL-12.5
T5 On-site	*Forested Wetland (Coastal Floodplain Wetlands)*	-0.2° Upslope	10m	0m-<9m	BAL-FZ
				9m-<10m	BAL-40
				10m-<14m	BAL-29
				14m-<20m	BAL-19
				20m-<100m	BAL-12.5
T6 On-site	*Forested Wetland (Coastal Floodplain Wetlands)*	-2.3° Upslope	9m	0m-<8m	BAL-FZ
				8m-<9m	BAL-40
				9m-<12m	BAL-29
				12m-<18m	BAL-19
				18m-<100m	BAL-12.5
T7 West	*Grassland*	-2.3° Upslope	10m	0m-<8m	BAL-FZ
				8m-<10m	BAL-40
				10m-<15m	BAL-29
				15m-<22m	BAL-19
				22m-<50m	BAL-12.5

Transect	Vegetation Classification (PBP 2019)	Slope	Recommended APZ (<29kW/m²)	Distance from Hazard	Bushfire Attack Level (BAL)
T8 West	*Grassland*	-0.2° Upslope	10m	0m-<9m	BAL-FZ
				9m-<10m	BAL-40
				10m-<15m	BAL-29
				15m-<22m	BAL-19
				22m-<50m	BAL-12.5
T9 West	*Forest (Hunter Macleay DSF)*	3.7° Downslope	19m	0m-<18m	BAL-FZ
				18m-<19m	BAL-40
				19m-<27m	BAL-29
				27m-<38m	BAL-19
				38m-<100m	BAL-12.5
T10 West	*Forest (Hunter Macleay DSF)*	2.0° Downslope	18m	0m-<16m	BAL-FZ
				16m-<18m	BAL-40
				18m-<25m	BAL-29
				25m-<35m	BAL-19
				35m-<100m	BAL-12.5
T11 West	*Forest (Hunter Macleay DSF)*	Flat*	16m	0m-<14m	BAL-FZ
				14m-<16m	BAL-40
				16m-<23m	BAL-29
				23m-<32m	BAL-19
				32m-<100m	BAL-12.5
T12 West	*Grassland*	1.7° Downslope	11m	0m-<10m	BAL-FZ
				10m-<11m	BAL-40
				11m-<17m	BAL-29
				17m-<25m	BAL-19
				25m-<50m	BAL-12.5
T13 & T14 South	Excluded (Managed Land)	<5.0° Downslope	N/A	N/A	BAL-LOW
T15 East	*Grassland*	1.5° Downslope	11m	0m-<10m	BAL-FZ
				10m-<11m	BAL-40
				11m-<17m	BAL-29
				17m-<25m	BAL-19
				25m-<50m	BAL-12.5

* T11 slope has been assessed as 'flat' given 0.2 downslope is considered marginal and associated results are negligible.



Lot	BAL
101	BAL-FZ
102	BAL-29
103	BAL-29
104	BAL-29
105	BAL-29
106	BAL-29
107	BAL-29
108	BAL-29
109	BAL-12.5
110	BAL-12.5
111	BAL-12.5
112	BAL-12.5
113	BAL-FZ
114	BAL-19
115	BAL-12.5
116	BAL-LOW
117	BAL-LOW
118	BAL-LOW
119	BAL-LOW
120	BAL-LOW
121	BAL-12.5
122	BAL-12.5
123	BAL-12.5
124	BAL-19
125	BAL-19
126	BAL-19
127	BAL-19
128	BAL-12.5
129	BAL-12.5
130	BAL-12.5
131	BAL-LOW
132	BAL-LOW
133	BAL-LOW
134	BAL-LOW
135	BAL-LOW
136	BAL-LOW
137	BAL-12.5
138	BAL-12.5
139	BAL-12.5
140	BAL-29
141	BAL-29
142	Open space
201	BAL-FZ
202	BAL-19
203	BAL-12.5
204	BAL-LOW
205	BAL-LOW
206	BAL-12.5
207	BAL-12.5
208	BAL-12.5
209	BAL-19
210	BAL-FZ
211	BAL-FZ

Lot	BAL
212	BAL-29
213	BAL-29
214	BAL-29
215	BAL-29
216	BAL-LOW
217	BAL-LOW
218	BAL-LOW
219	BAL-12.5
220	BAL-12.5
221	BAL-12.5
222	BAL-19
223	BAL-19
224	BAL-19
225	BAL-12.5
226	BAL-12.5
227	BAL-12.5
228	BAL-LOW
229	BAL-LOW
230	BAL-LOW
231	BAL-LOW
232	BAL-LOW
233	BAL-LOW
234	BAL-12.5
235	BAL-12.5
236	BAL-12.5
237	BAL-19
238	BAL-19
239	BAL-19
240	BAL-19
241	BAL-12.5
242	BAL-12.5
243	BAL-12.5
244	BAL-LOW
245	BAL-LOW
246	BAL-LOW
247	BAL-LOW
248	BAL-LOW
249	BAL-LOW
250	BAL-12.5
251	BAL-12.5
252	BAL-12.5
253	BAL-19
254	BAL-19
301	BAL-19
302	BAL-19
303	BAL-12.5
304	BAL-12.5
305	BAL-12.5
306	BAL-LOW
307	BAL-LOW
308	BAL-LOW
309	BAL-LOW
310	BAL-LOW

Lot	BAL
311	BAL-LOW
312	BAL-LOW
313	BAL-LOW
314	BAL-LOW
315	BAL-12.5
316	BAL-12.5
317	BAL-12.5
318	BAL-12.5
319	BAL-29
320	BAL-29
321	BAL-29
322	BAL-29
323	BAL-29
324	BAL-29
325	BAL-12.5
326	BAL-12.5
327	BAL-12.5
328	BAL-19
329	BAL-12.5
330	BAL-12.5
331	BAL-12.5
332	BAL-12.5
333	BAL-19
334	BAL-19
335	BAL-19
336	BAL-12.5
337	BAL-12.5
338	BAL-12.5
339	BAL-12.5
340	BAL-12.5
341	BAL-LOW
342	BAL-12.5
343	BAL-12.5
344	BAL-12.5
345	BAL-12.5
346	BAL-19
401	BAL-29
402	BAL-29
403	BAL-12.5
404	BAL-12.5
405	BAL-12.5
406	BAL-LOW
407	BAL-LOW
408	BAL-LOW
409	BAL-LOW
410	BAL-LOW
411	BAL-12.5
412	BAL-12.5
413	BAL-12.5
414	BAL-29
415	BAL-29
416	BAL-29
417	BAL-29

Lot	BAL
418	BAL-12.5
419	BAL-12.5
420	BAL-12.5
421	BAL-LOW
422	BAL-LOW
423	BAL-LOW
424	BAL-LOW
425	BAL-LOW
426	BAL-LOW
427	BAL-LOW
428	BAL-LOW
429	BAL-12.5
430	BAL-12.5
431	BAL-12.5
432	BAL-12.5
433	BAL-29
434	BAL-29
435	BAL-29
436	BAL-29
437	BAL-29
438	BAL-29
439	BAL-29
440	BAL-29
441	BAL-29
442	BAL-29
443	BAL-29
444	BAL-29
445	BAL-29
446	BAL-29
447	BAL-12.5
448	BAL-12.5
449	BAL-12.5
450	BAL-12.5
451	BAL-12.5
452	BAL-12.5
453	BAL-12.5
454	BAL-12.5
455	BAL-12.5
501	BAL-FZ
502	BAL-12.5
503	BAL-12.5
504	BAL-12.5
505	BAL-12.5
506	BAL-12.5
507	BAL-12.5
508	BAL-12.5
509	BAL-12.5
510	BAL-12.5
511	BAL-12.5
512	BAL-12.5
513	BAL-12.5
514	BAL-12.5
515	BAL-12.5

Lot	BAL
516	BAL-12.5
517	BAL-12.5
518	BAL-12.5
519	BAL-12.5
520	BAL-LOW
521	BAL-LOW
522	BAL-12.5
523	BAL-12.5
524	BAL-12.5
525	BAL-12.5
526	BAL-29
527	BAL-29
528	BAL-29
529	BAL-29
530	BAL-29
531	BAL-29
532	BAL-29
533	BAL-29
534	BAL-29
535	BAL-29
536	BAL-29
601	BAL-FZ
602	BAL-19
603	BAL-29
604	BAL-29
605	BAL-29
606	BAL-29
607	BAL-29
608	BAL-29
609	BAL-29
610	BAL-FZ
611	BAL-19
612	BAL-LOW
613	BAL-LOW
614	BAL-LOW
615	BAL-LOW
616	BAL-LOW
617	BAL-12.5
618	BAL-12.5
619	BAL-12.5
620	BAL-12.5
621	BAL-12.5
622	BAL-12.5
623	BAL-12.5
624	BAL-12.5
625	BAL-12.5
626	BAL-12.5
627	BAL-12.5
628	BAL-12.5
629	BAL-12.5
630	BAL-12.5
631	BAL-FZ

BUSHFIRE PLANNING AUSTRALIA

Source:	Cadastral Boundary: NSW Department of Finance, Services and Innovation 2021 Aerial Photo: Nearmap 03/01/2023
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: 2179-McFarlanesRd-Fig7-BALs-TEMPORARY-230519 Date: 19/05/2023

0 50 100 150
Meters

A3 Scale: 1:4,500

Coordinate System: GDA 1994 MGA Zone 56

Project: 173 McFarlanes Road, Chisholm
Job no: 2179

Figure 18:

Subdivision BAL Plan - Temporary

Subject Site
140m Buffer
100m Buffer
Environmental Management Zone
Asset Protection Zone
Required Bushfire Attack Levels (AS3959-2018)
BAL - FZ
BAL - 40
BAL - 29
BAL - 19
BAL - 12.5

DA/2018/626
(DA Approved)

Lot 4 DP1100396

Lot 33 D.P.529007

Lot 3 DP79

14 m
16 m
23 m
32 m
335
346
345

3098 DP1246288

16 m
18 m
25 m
35 m
240
239
238
237

212
209
211
210
9 m
10 m
15 m
22 m

Terrace

9 m
10 m
14 m
20 m
623
622
621

441
442
443
444
17 m
19 m
27 m
37 m

534
535
536
10 m
11 m
16 m
24 m

DA 2020/173
(Under Assessment)

DA/2019/653
(DA Approved)

DA/2019/574
(DA Approved)

Lot 100 DP847510

Lot 211 DP1291100

DA/2019/652
(DA Approved)

Lot 30 DP778111

DA/2019/573
(DA Under Assessment)

DA/2019/573
(DA Approved)

Lot 20 DP832785

1 INTO 2 SUBDIVISION OF SOUTHERN PORTION OF LOT 31 DP778111 UNDER SEPARATE CONSENT

Raymond Terrace Road

BUSHFIRE PLANNING AUSTRALIA

Source:	Cadastral Boundary: NSW Department of Finance, Services and Innovation 2021
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: 2179-McFarlanesRd-Fig8-BALs-PERMANENT-230519 Date: 19/05/2023

0 50 100 150
Meters

A3 Scale: 1:4,500
Coordinate System: GDA 1994 MGA Zone 56

Project: 173 McFarlanes Road, Chisholm
Job no: 2179

Figure 19:
Subdivision BAL Plan - Permanent

Subject Site
140m Buffer
100m Buffer
Managed Land
Active Open Space/ Parkland
C2 Environmental Conservation Zone
Coastal Floodplain Wetlands
Forest (Hunter Macleay)

Asset Protection Zone

Required Bushfire Attack Levels (AS3959-2018)

BAL - FZ
BAL - 40
BAL - 29
BAL - 19
BAL - 12.5

DA/2018/626
(DA Approved)

Lot 4100 DP1274874

Lot 33 DP529007

Lot 1 DP1108983

McFarlanes Road

Lot 32 DP794448

Lot 1 DP1253854

Lot 4 DP1145348

Tigerhawk Drive

DA/2021/1662
(DA Approved)

DA 2020/173
(Under Assessment)

DA/2019/653
(DA Approved)

DA/2019/574
(DA Approved)

Lot 30 DP778111

Lot 100 DP847510

DA/2019/573
(DA Under Assessment)

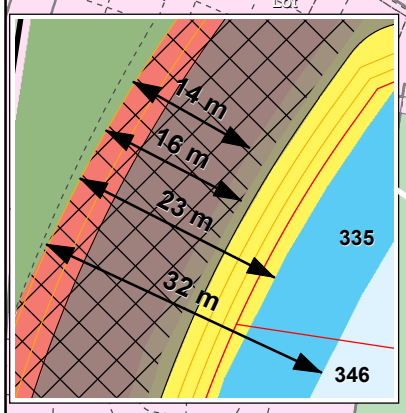
1 INTO 2 SUBDIVISION OF SOUTHERN PORTION OF LOT 31 DP778111 UNDER SEPARATE CONSENT

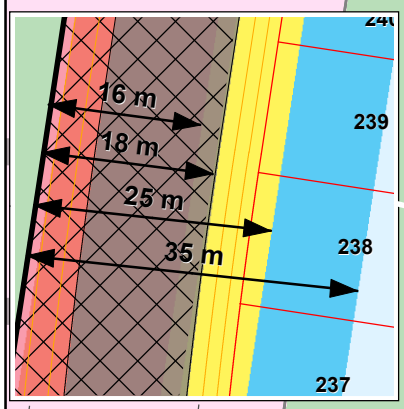
DA/2019/573
(DA Approved)
DP832785

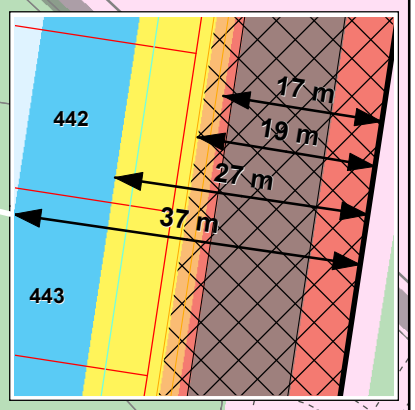
Lot 553 DP793758

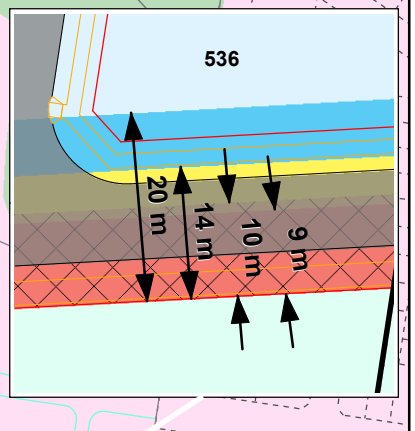
Raymond Terrace Road

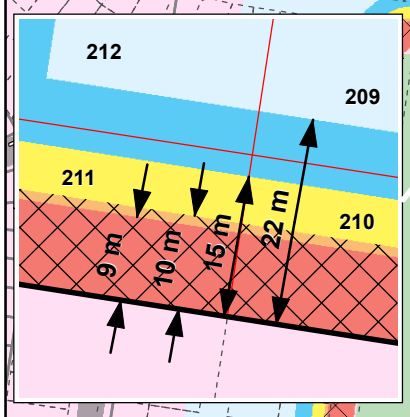
Raymond Terrace Road Raymond

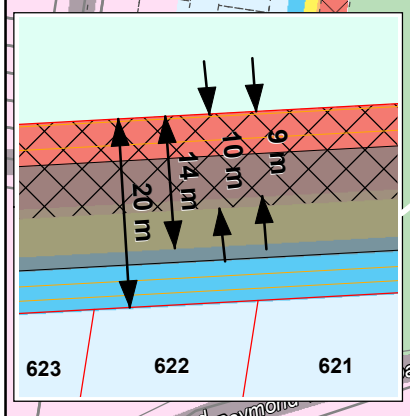












Lot	BAL
101	BAL-LOW
102	BAL-LOW
103	BAL-LOW
104	BAL-LOW
105	BAL-LOW
106	BAL-LOW
107	BAL-LOW
108	BAL-LOW
109	BAL-LOW
110	BAL-LOW
111	BAL-LOW
112	BAL-LOW
113	BAL-LOW
114	BAL-LOW
115	BAL-LOW
116	BAL-LOW
117	BAL-LOW
118	BAL-LOW
119	BAL-LOW
120	BAL-LOW
121	BAL-12.5
122	BAL-12.5
123	BAL-12.5
124	BAL-19
125	BAL-19
126	BAL-19
127	BAL-19
128	BAL-12.5
129	BAL-12.5
130	BAL-12.5
131	BAL-LOW
132	BAL-LOW
133	BAL-LOW
134	BAL-LOW
135	BAL-LOW
136	BAL-LOW
137	BAL-12.5
138	BAL-12.5
139	BAL-12.5
140	BAL-29
141	BAL-29
142	Open space
201	BAL-LOW
202	BAL-LOW
203	BAL-LOW
204	BAL-LOW
205	BAL-LOW
206	BAL-12.5
207	BAL-12.5
208	BAL-12.5
209	BAL-12.5
210	BAL-12.5
211	BAL-29

Lot	BAL
212	BAL-29
213	BAL-29
214	BAL-29
215	BAL-29
216	BAL-LOW
217	BAL-LOW
218	BAL-LOW
219	BAL-12.5
220	BAL-12.5
221	BAL-12.5
222	BAL-19
223	BAL-19
224	BAL-19
225	BAL-12.5
226	BAL-12.5
227	BAL-12.5
228	BAL-LOW
229	BAL-LOW
230	BAL-LOW
231	BAL-LOW
232	BAL-LOW
233	BAL-LOW
234	BAL-12.5
235	BAL-12.5
236	BAL-12.5
237	BAL-19
238	BAL-19
239	BAL-19
240	BAL-19
241	BAL-12.5
242	BAL-12.5
243	BAL-12.5
244	BAL-LOW
245	BAL-LOW
246	BAL-LOW
247	BAL-LOW
248	BAL-LOW
249	BAL-LOW
250	BAL-12.5
251	BAL-12.5
252	BAL-12.5
253	BAL-19
254	BAL-19
301	BAL-19
302	BAL-19
303	BAL-12.5
304	BAL-12.5
305	BAL-12.5
306	BAL-LOW
307	BAL-LOW
308	BAL-LOW
309	BAL-LOW
310	BAL-LOW

Lot	BAL
311	BAL-LOW
312	BAL-LOW
313	BAL-LOW
314	BAL-LOW
315	BAL-12.5
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317	BAL-12.5
318	BAL-12.5
319	BAL-29
320	BAL-29
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322	BAL-29
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325	BAL-12.5
326	BAL-12.5
327	BAL-12.5
328	BAL-19
329	BAL-29
330	BAL-12.5
331	BAL-12.5
332	BAL-12.5
333	BAL-12.5
334	BAL-12.5
335	BAL-19
336	BAL-12.5
337	BAL-12.5
338	BAL-12.5
339	BAL-12.5
340	BAL-12.5
341	BAL-LOW
342	BAL-12.5
343	BAL-12.5
344	BAL-12.5
345	BAL-12.5
346	BAL-19
401	BAL-29
402	BAL-29
403	BAL-12.5
404	BAL-12.5
405	BAL-12.5
406	BAL-LOW
407	BAL-LOW
408	BAL-LOW
409	BAL-LOW
410	BAL-LOW
411	BAL-12.5
412	BAL-12.5
413	BAL-12.5
414	BAL-29
415	BAL-29
416	BAL-29
417	BAL-29

Lot	BAL
418	BAL-12.5
419	BAL-12.5
420	BAL-12.5
421	BAL-LOW
422	BAL-LOW
423	BAL-LOW
424	BAL-LOW
425	BAL-LOW
426	BAL-LOW
427	BAL-LOW
428	BAL-LOW
429	BAL-12.5
430	BAL-12.5
431	BAL-12.5
432	BAL-12.5
433	BAL-29
434	BAL-29
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437	BAL-29
438	BAL-29
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440	BAL-29
441	BAL-29
442	BAL-29
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444	BAL-29
445	BAL-29
446	BAL-29
447	BAL-12.5
448	BAL-12.5
449	BAL-12.5
450	BAL-12.5
451	BAL-12.5
452	BAL-12.5
453	BAL-12.5
454	BAL-12.5
455	BAL-12.5
501	BAL-LOW
502	BAL-LOW
503	BAL-LOW
504	BAL-LOW
505	BAL-LOW
506	BAL-LOW
507	BAL-LOW
508	BAL-LOW
509	BAL-12.5
510	BAL-12.5
511	BAL-12.5
512	BAL-12.5
513	BAL-12.5
514	BAL-12.5
515	BAL-12.5

Lot	BAL
516	BAL-12.5
517	BAL-12.5
518	BAL-12.5
519	BAL-12.5
520	BAL-LOW
521	BAL-LOW
522	BAL-LOW
523	BAL-LOW
524	BAL-LOW
525	BAL-LOW
526	BAL-LOW
527	BAL-LOW
528	BAL-LOW
529	BAL-LOW
530	BAL-LOW
531	BAL-LOW
532	BAL-12.5
533	BAL-12.5
534	BAL-12.5
535	BAL-12.5
536	BAL-12.5
601	BAL-12.5
602	BAL-12.5
603	BAL-12.5
604	BAL-12.5
605	BAL-12.5
606	BAL-LOW
607	BAL-LOW
608	BAL-LOW
609	BAL-LOW
610	BAL-LOW
611	BAL-LOW
612	BAL-LOW
613	BAL-LOW
614	BAL-LOW
615	BAL-LOW
616	BAL-LOW
617	BAL-12.5
618	BAL-12.5
619	BAL-12.5
620	BAL-12.5
621	BAL-12.5
622	BAL-12.5
623	BAL-12.5
624	BAL-12.5
625	BAL-12.5
626	BAL-12.5
627	BAL-LOW
628	BAL-LOW
629	BAL-LOW
630	BAL-LOW
631	BAL-LOW
632	BAL-LOW

BUSHFIRE PLANNING AUSTRALIA

Source:	Cadastral Boundary: NSW Department of Finance, Services and Innovation 2021
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: 2179-McFarlanesRd-Fig8-BALs-PERMANENT-230525 Date: 25/05/2023

N

0 50 100 150
Meters

A3 Scale: 1:4,500
Coordinate System: GDA 1994 MGA Zone 56

Project: 173 McFarlanes Road, Chisholm
Job no: 2179

Figure 8:
Subdivision BAL Plan - Permanent

4.7. 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 defendable space for property protection;
- Reduce fire spread;
- Deflect and filter embers;
- Provide shelter from radiant heat; and
- Reduce wind speed.

Plants that are less flammable have the following features;

- High moisture content and / or high levels of salt;
- Low volatile oil content of leaves;
- Smooth barks without ‘ribbons’ hanging from branches or trunks; and
- Dense crown and elevated branches.

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.

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.

5. Conclusion and Recommendations

Bushfire Planning Australia prepared a Bushfire Assessment Report for the proposed residential subdivision known as the 'Harris-May site' located at 173 McFarlanes Road and 507 Raymond Terrace Road, Chisholm; legally referred to as Lot 32 and Lot 31 DP778111 respectively.

The proposed development comprises a 264 Torrens title residential subdivision to be constructed in several stages. The design and layout (including roads) of the proposed subdivision is consistent with the Thornton North Master Plan prepared by Maitland City Council. As the plan of subdivision is consistent with the Master Plan, the proposed subdivision is not provided with direct to an existing public road. Consequently, development of the subject site cannot be completed until the subdivision of one or more of the adjoining properties has been completed. With this in mind, in addition to assessing the existing bushfire hazard, the BAR designed a series of recommendations relevant to the proposed subdivision following subdivision of the adjoining properties.

This BAR found the site was currently exposed to high bushfire hazard located to the west of the subject site. The predominant vegetation surrounding the site in unmanaged conditions is consistent with a *forest,* specifically *Hunter Macleay Dry Sclerophyll Forest*.

The bushfire hazard will be substantially reduced over the next 2-5 years as the remaining land surrounding the subject site zoned for residential use is subdivided and the remaining hazardous vegetation removed.

As the site is identified as the Thornton North Urban Release Area in the Maitland Local Government Area Bush Fire Planning - Urban Release Area Map, a Subdivision BAL Plan has been prepared and is contained in **Appendix E**. As part of the application for a Bush Fire Safety Authority under section 100b of the *Rural Fires Act 1997*, 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).

The following key recommendations have been designed to enable the proposed development to achieve the aims and objectives of PBP 2019:

1. All land within the development site; excluding the riparian corridor, is be managed as an inner protection area (IPA) as outlined Appendix 4 of PBP 2019 and the RFS document *Standards for asset protection zones*;
2. The APZs shown in **Figure 19 - 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 the Performance Criteria detailed in Table 5.3b of PBP 2019. This will require the provision of a minimum of twelve (12) separate road access points provided from the development site to the north, east and west to ensure safe evacuation for all residents;
4. On-street vehicle parking may be permitted within road carriageways as all roads are a minimum 8m wide;
5. All temporary turning heads shall be constructed in accordance Appendix A3.3 of PBP 2019;
6. 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);
7. The Bushfire Attack Level (BAL) ratings identified in **Figure 19 - 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;

8. 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;
9. Consideration should be given to landscaping and fuel loads on site to decrease potential fire hazards on site; and
10. The Rural Fire Service endorse the Subdivision BAL Plan contained in **Appendix E**.

This assessment has been made based on the bushfire hazards observed in and around the site at the time of inspection and production (May 2023).

Should the above recommendations be implemented commensurate to the low threat hazard, the nominal bushfire risk can 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.

6. References

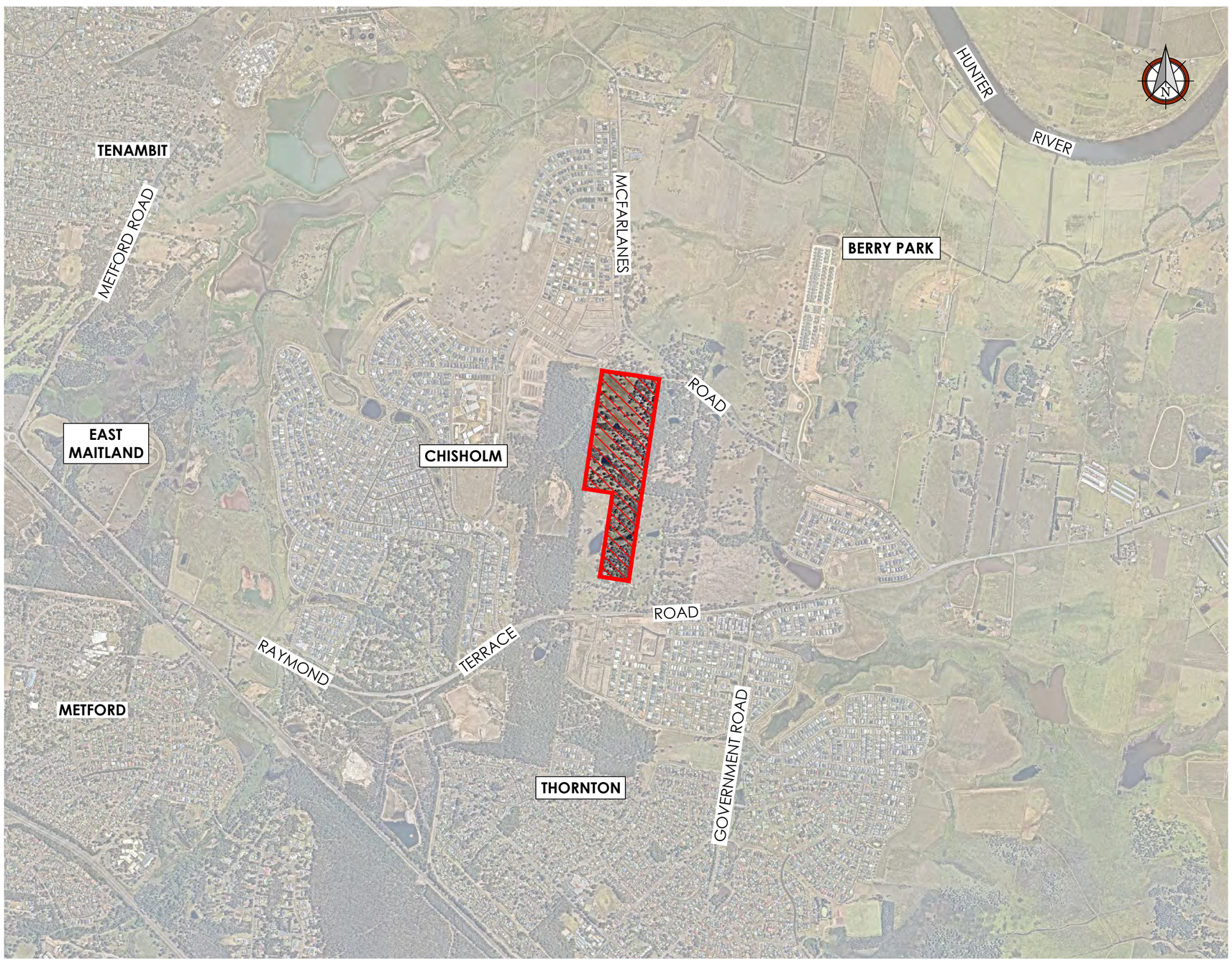
- NSW Rural Fire Service (2005). Standards for Asset Protection Zones. NSW Rural Fire Service.
- NSW Rural Fire Service (2019). Planning for Bushfire Protection – A Guide for Councils, Planners, Fire Authorities, Developers and Home Owners.
- Ramsay, GC and Dawkins, D (1993). Building in Bushfire-prone 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: Proposed Plan of Subdivision

240294(70)-DA-001

DEVELOPMENT APPLICATION

LOTS 31 & 32 D.P. 778111
507 RAYMOND TERRACE ROAD &
173 MCFARLANES ROAD, CHISHOLM



INDEX OF DRAWINGS

Sheet Title	Sheet Description
DA-001	COVER SHEET AND DRAWING INDEX
DA-002	PRECINCT PLAN
DA-003	EXISTING SITE NATURAL SURFACE PLAN
DA-004	LEP ZONING
DA-005	LEP MINIMUM LOT SIZE
DA-006	OVERALL STAGE MASTER PLAN
DA-007	STAGES 1 AND 2 DETAIL PLAN
DA-008	STAGES 3 AND 4 DETAIL PLAN
DA-009	STAGES 5 AND 6 DETAIL PLAN
DA-010	LOT MIX PLAN 1
DA-011	LOT MIX PLAN 2
DA-012	MOBILITY PLAN (PATHWAYS, CYCLEWAYS, SHARED PATHS)
DA-013	VEGETATION REMOVAL/RETENTION PLAN

BEFORE YOU DIG www.byda.com.au

drawing title:

COVER SHEET AND DRAWING INDEX

location: 507 RAYMOND TERRACE RD & 173 MCFARLANES RD, CHISHOLM

council: MAITLAND CITY COUNCIL

dwg ref: 240294(70)-DA-001

client: ALLAM PROPERTY GROUP

SHEET 1 OF 13

ver.	date	comment	drawn	pm	co-ordinate information	level information	scale (A1 original size)	notes
A	20.04.2023	INITIAL ISSUE	LS	CMO	CO-ORDINATE SYSTEM: MGA56 GDA94	DATUM: N/A CONTOUR INTERVAL: N/A		

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hunter office ph: (02) 4978 5100
sydney office ph: (02) 8046 7411
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working beyond expectations

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

Plotted By: Leah Swain Plot Date: 24/04/23 12:29:56PM Cad File: N:\240294\240294(70)\DWG\PLANNING\DA\240294(70)-DA-001.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.

240294(70)-DA-002

LEGEND

- D.A. BOUNDARY
- SUBJECT PRECINCT BOUNDARY
- DISTRIBUTOR / COLLECTOR - PRIMARY / COLLECTOR - SECONDARY
- ON ROAD CYCLE PATH
- 2.5M SHARED PATH (LINEAR LINKAGES TN30)
- INDICATIVE LOCAL ROAD (PRIMARY)
- ROAD WIDENING
- RESIDENTIAL ZONE
- ENVIRONMENTAL ZONE
- RIPARIAN ZONE
- RIPARIAN CORRIDOR
- STORMWATER MANAGEMENT BASIN
- ROADSIDE/LANDSCAPE BUFFER
- LOCAL PLAYGROUND

NOTE:-

1. LAYOUT IS BASED ON DCDB CADASTRE, AND THEREFORE CONSIDERED INDICATIVE ONLY.

N

MCFARLANES ROAD

Environmental Zone Retained Bushland

Passive Open Space (TN28) (4.2 ha.)

Stormwater Management

Distributor Road

SUBJECT SITE

Stormwater Management

Local Playground (TN8)

Distributor Road

TIGERHAWK DRIVE

Make connection to existing Tigerhawk Drive

RND/ABT CONTAINED WHOLLY WITHIN 31/778111

Aligned to Distributor Road (DA 2020/173)

Collector Road

Local Playground (TN7)

Stormwater Management

Aligned to Collector Road (DA 2019/574)

Collector Road

RND/ABT CONTAINED WHOLLY WITHIN 30/778111

Linear Linkages (TN30)

Environmental Zone Retained Bushland

SETTLERS BOULEVARD

TERRACE

ROAD

RAYMOND

SHEET 2 OF 13

ver.	date	comment	drawn	pm	co-ordinate information	level information	scale (A1 original size)	notes
A	20.04.2023	INITIAL ISSUE	LS	CMO	CO-ORDINATE SYSTEM: MGA56 GDA94	DATUM: N/A CONTOUR INTERVAL: N/A	0 50 100 125m SCALE: 1:2500 (FULL)	

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drawing title:
THORNTON NORTH URBAN RELEASE AREA PRECINCT 7

location: 507 RAYMOND TERRACE RD & 173 MCFARLANES RD, CHISHOLM

council: MAITLAND CITY COUNCIL

dwg ref: 240294(70)-DA-002

client: ALLAM PROPERTY GROUP

adw johnson
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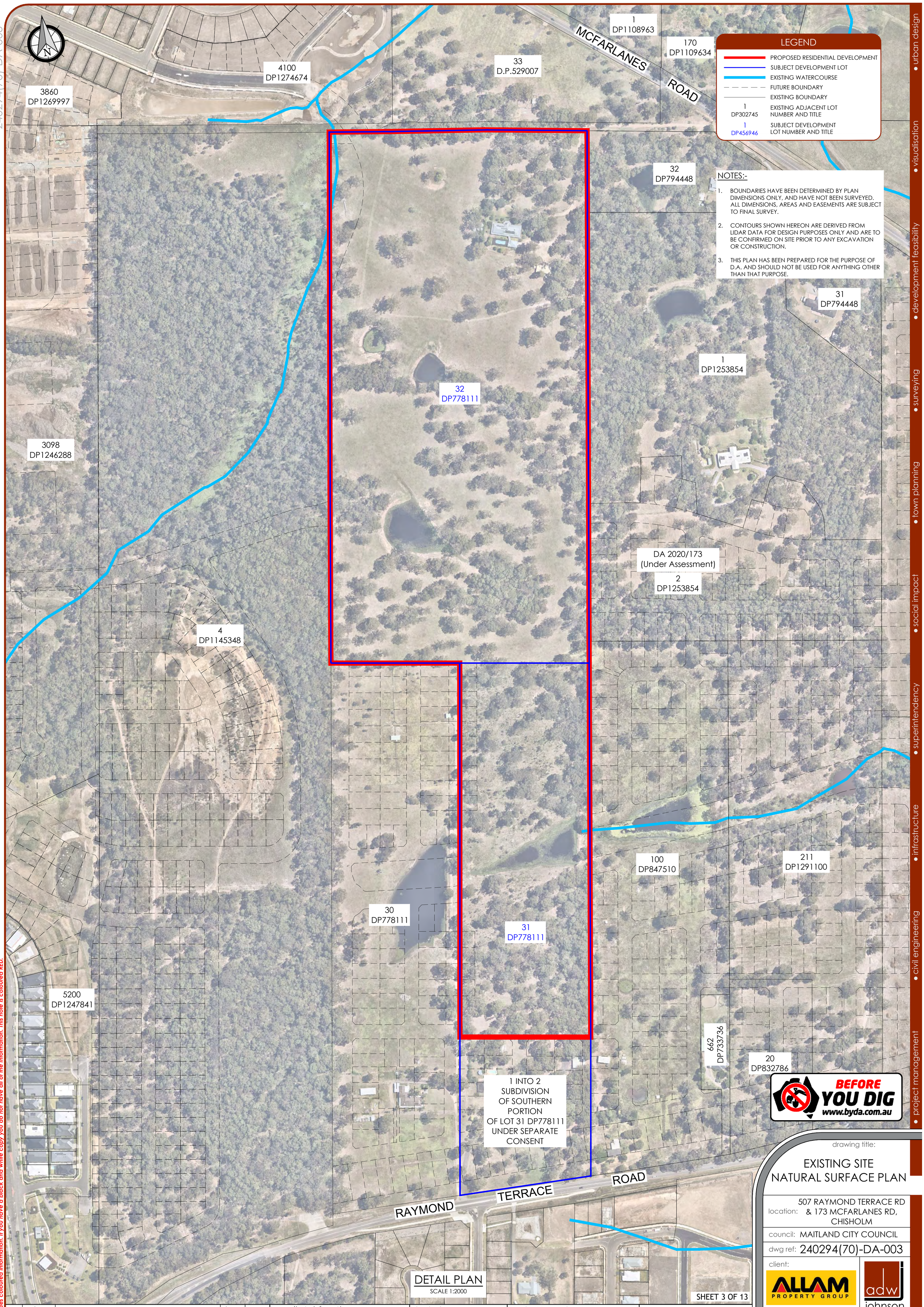
240294(70)-DA-003



LEGEND

- PROPOSED RESIDENTIAL DEVELOPMENT
- SUBJECT DEVELOPMENT LOT
- EXISTING WATERCOURSE
- FUTURE BOUNDARY
- EXISTING BOUNDARY
- 1 DP302745 — EXISTING ADJACENT LOT NUMBER AND TITLE
- 1 DP456946 — SUBJECT DEVELOPMENT LOT NUMBER AND TITLE

NOTES:-

1. BOUNDARIES HAVE BEEN DETERMINED BY PLAN DIMENSIONS ONLY, AND HAVE NOT BEEN SURVEYED. ALL DIMENSIONS, AREAS AND EASEMENTS ARE SUBJECT TO FINAL SURVEY.
2. CONTOURS SHOWN HEREON ARE DERIVED FROM LIDAR DATA FOR DESIGN PURPOSES ONLY AND ARE TO BE CONFIRMED ON SITE PRIOR TO ANY EXCAVATION OR CONSTRUCTION.
3. THIS PLAN HAS BEEN PREPARED FOR THE PURPOSE OF D.A. AND SHOULD NOT BE USED FOR ANYTHING OTHER THAN THAT PURPOSE.

DETAIL PLAN
SCALE 1:2000

SHEET 3 OF 13

ver.	date	comment	drawn	pm	co-ordinate information	level information	scale (A1 original size)	notes
A	20.04.2023	INITIAL ISSUE	LS	CMO	CO-ORDINATE SYSTEM: MGA56 GDA94	DATUM: AHD CONTOUR INTERVAL: 2m	A1 1:2000 / A3 1:4000 — 0 50 100m	

working beyond expectations

drawing title:

EXISTING SITE NATURAL SURFACE PLAN

location: 507 RAYMOND TERRACE RD & 173 MCFARLANES RD, CHISHOLM

council: MAITLAND CITY COUNCIL

dwg ref: 240294(70)-DA-003

client: ALLAM PROPERTY GROUP

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240294(70)-DA-006

N

3860
DP1269997

4100
DP1274674

33
D.P.529007

1
DP1108963

MCFARLANES ROAD

170
DP1109634

32
DP794448

3098
DP1246288

4
DP1145348

5200
DP1247841

DP12

DA 2020/173
(Under Assessment)

2
DP1253854

100
DP847510

211
DP1291100

30
DP778111

662
DP733736

20
DP832786

Pt.1
(RESIDUE)
5117.30m^2
(3704.71m^2)

Pt.1
(RESIDUE)
5117.30m^2
(1412.59m^2)

1 INTO 2
SUBDIVISION
OF SOUTHERN
PORTION
OF LOT 31 DP778111
UNDER SEPARATE
CONSENT

RAYMOND TERRACE ROAD

LEGEND

- PROPOSED RESIDENTIAL DEVELOPMENT
- STAGE BOUNDARY
- PROPOSED BOUNDARY
- FUTURE BOUNDARY
- EXISTING BOUNDARY
- 2 STAGE NUMBER
- STORMWATER BASIN
- PROPOSED RESIDENTIAL
- PROPOSED RESIDUE LOT
- PROPOSED COUNCIL DEDICATED RESERVE
- PROPOSED ROAD

LOT SCHEDULE

STAGE	RESIDENTIAL LOTS	PUBLIC RESERVE LOTS
STAGE 1	41	1
STAGE 2	54	0
STAGE 3	46	1
STAGE 4	55	0
STAGE 5	36	1
STAGE 6	32	0
TOTAL LOTS	264	3
RESIDUE LOTS	1	

DETAIL PLAN
SCALE 1:2000

SHEET 6 OF 13

ver.	date	comment	drawn	pm	co-ordinate information	level information	scale (A1 original size)	notes
A	20.04.2023	INITIAL ISSUE	LS	CMO	CO-ORDINATE SYSTEM: MGA56 GDA94	DATUM: N/A CONTOUR INTERVAL: N/A	A1 1:2000 · 0 · 50 · 100m · A3 1:4000	

working beyond expectations

drawing title:

OVERALL STAGE MASTER PLAN

location: 507 RAYMOND TERRACE RD & 173 MCFARLANES RD, CHISHOLM

council: MAITLAND CITY COUNCIL

dwg ref: 240294(70)-DA-006

client: ALLAM PROPERTY GROUP

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240294(70)-DA-007

LOT SCHEDULE		
STAGE	RESIDENTIAL LOTS	PUBLIC RESERVE LOTS
STAGE 1	41	1
STAGE 2	54	0

VERGE
ROAD
BUS STOP
EASEMENT TO DRAIN WATER

ROAD MC09
ROAD MC12
ROAD MC13
17m RESERVE (4.5-8-4
ROAD MC08
17m RESERVE (4.5-8-4.5)
ROAD MC07
ROAD MC02
22.5m RESERVE (4.5-12.5-5.5)
20.5m RESERVE (4.5-10.5-5.5)
ROAD MC03
ROAD MC01
25m RESERVE (4.5-15-5.5)
ROAD MC06
17m RESERVE (4.5-8-4.5)
ROAD MC11
ROAD MC10
ROAD MC05
ROAD MC16
22m RESERVE (4.5-12-5.5)

1
DP1253854

DA 2020/173
(Under Assessment)
2
DP1253854

4
DP1145348

100
DP847510

30
DP778111

DETAIL PLAN
SCALE 1:750

SHEET 7 OF 13

ver.	date	comment	drawn	pm	co-ordinate information	level information	scale (A1 original size)	notes
A	20.04.2023	INITIAL ISSUE	LS	CMO	CO-ORDINATE SYSTEM: MGA56 GDA94	DATUM: N/A CONTOUR INTERVAL: N/A	A1 1:750 / A3 1:1500 (0 15.0 30.0 37.5m)	

working beyond expectations

drawing title:

STAGES 1 AND 2
DETAIL PLAN

location: 507 RAYMOND TERRACE RD & 173 MCFARLANES RD, CHISHOLM

council: MAITLAND CITY COUNCIL

dwg ref: 240294(70)-DA-007

client: ALLAM PROPERTY GROUP

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240294(70)-DA-008

LOT SCHEDULE		
STAGE	RESIDENTIAL LOTS	PUBLIC RESERVE LOTS
STAGE 3	46	1
STAGE 4	55	0

STORMWATER BASIN
VERGE
ROAD
EASEMENT TO DRAIN WATER

4100
DP1274674

33
D.P.529007

32
DP794448

4
DP1145348

1
DP1253854

ROAD MC03
ROAD MC02
ROAD MC15 17m RESERVE (4.5-8-4.5)
17m RESERVE (4.5-8-4.5)
17m RESERVE (4.5-8-4.5)
20.5m RESERVE (4.5-10.5-5.5)
ROAD MC12
ROAD MC13
ROAD MC09
17m RESERVE (4.5-8-4.5)
ROAD MC03
22.5m RESERVE (4.5-12.5-5.5)
ROAD MC08 17m RESERVE (4.5-8-4.5)
ROAD MC08 17m RESERVE (4.5-8-4.5)
ROAD MC07 17m RESERVE (4.5-8-4.5)
ROAD MC02

DETAIL PLAN
SCALE 1:750

SHEET 8 OF 13

ver.	date	comment	drawn	pm	co-ordinate information	level information	scale (A1 original size)	notes
A	20.04.2023	INITIAL ISSUE	LS	CMO	CO-ORDINATE SYSTEM: MGA56 GDA94	DATUM: N/A CONTOUR INTERVAL: N/A	A1 1:750 · 0 15.0 30.0 37.5m · A3 1:1500	

drawing title:

STAGES 3 AND 4 DETAIL PLAN

location: 507 RAYMOND TERRACE RD & 173 MCFARLANES RD, CHISHOLM

council: MAITLAND CITY COUNCIL

dwg ref: 240294(70)-DA-008

client: ALLAM PROPERTY GROUP

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240294(70)-DA-009

17m RESERVE

DA 2020/173
(Under Assessment)
2
DP1253854

100
DP847510

30
DP778111

LOT SCHEDULE		
STAGE	RESIDENTIAL LOTS	PUBLIC RESERVE LOTS
STAGE 5	36	1
STAGE 6	32	0

VERGE
ROAD
EASEMENT TO DRAIN WATER

17m RESERVE (4.5-8-4.5)
20m RESERVE (4.5-10.5-5)

1 INTO 2 SUBDIVISION
OF SOUTHERN PORTION
OF LOT 31 DP778111
UNDER SEPARATE CONSENT

DETAIL PLAN
SCALE 1:750

SHEET 9 OF 13

ver.	date	comment	drawn	pm	co-ordinate information	level information	scale (A1 original size)	notes
A	20.04.2023	INITIAL ISSUE	LS	CMO	CO-ORDINATE SYSTEM: MGA56 GDA94	DATUM: N/A CONTOUR INTERVAL: N/A	A1 1:750 · 0 15.0 30.0 37.5m · A3 1:1500	

working beyond expectations

drawing title:
STAGES 5 AND 6 DETAIL PLAN

location: 507 RAYMOND TERRACE RD & 173 MCFARLANES RD, CHISHOLM
council: MAITLAND CITY COUNCIL
dwg ref: 240294(70)-DA-009
client: ALLAM PROPERTY GROUP

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Appendix B: AHIMS Search Results

AHIMS Web Services (AWS)
Search Result

Your Ref/PO Number : 2179 Harris Site 50m

Client Service ID : 778130

Katrina Greville

21 Costata Crescent
Adamstown New South Wales 2289

Attention: Katrina Greville

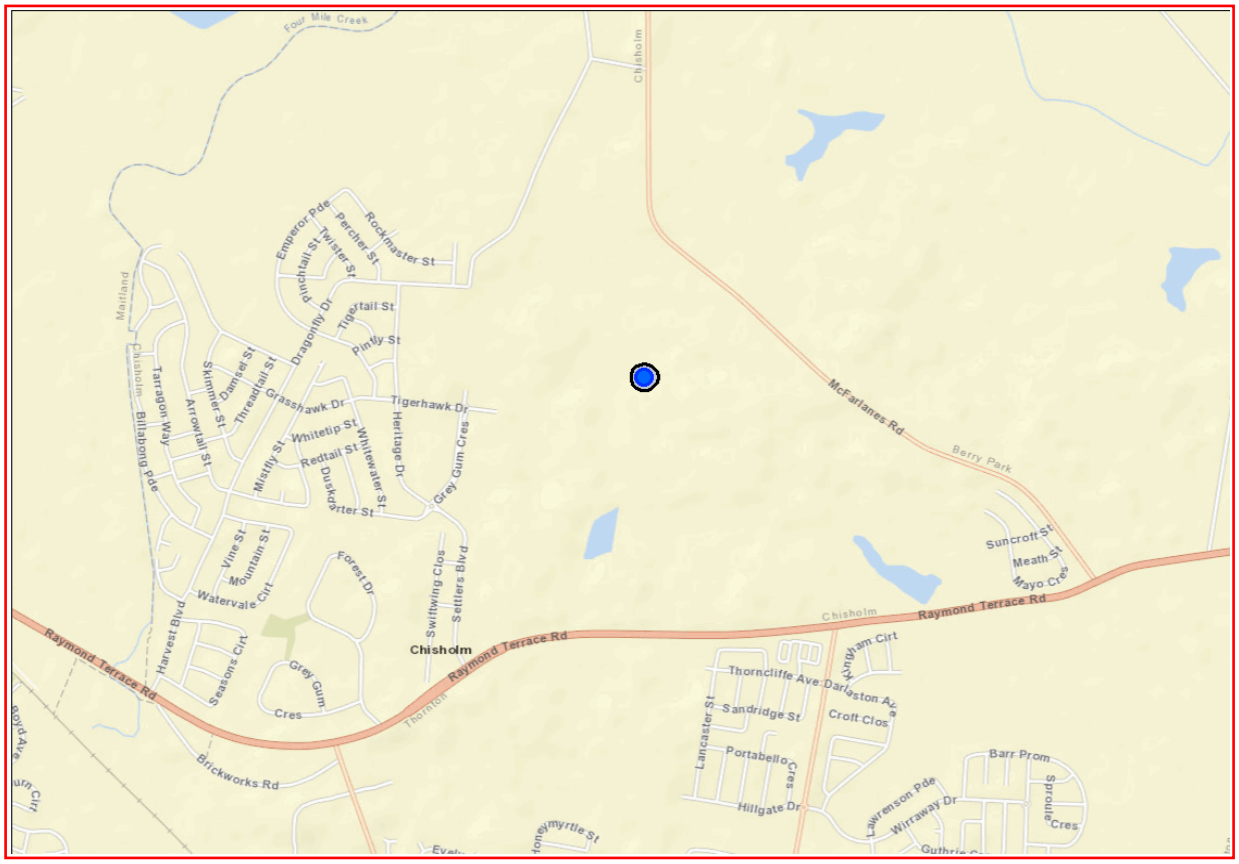
Email: klmukevski@bigpond.com

Date: 02 May 2023

Dear Sir or Madam:

AHIMS Web Service search for the following area at Address : 173 MCFARLANES ROAD CHISHOLM 2322 with a Buffer of 50 meters, conducted by Katrina Greville on 02 May 2023.

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) 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 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.

Level 6, 10 Valentine Ave, Parramatta 2150
Locked Bag 5020 Parramatta NSW 2124
Tel: (02) 9585 6345

ABN 34 945 244 274
Email: ahims@environment.nsw.gov.au
Web: www.heritage.nsw.gov.au

Appendix C: Planning for Bushfire Protection 2019 - Compliance Table

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

Objectives	Satisfied	Comment
➢ Afford buildings and their occupants protection from exposure to a bush fire	✓	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 12 different evacuation routes (for both the north and south precincts).
➢ Provide for a defendable space to be located around buildings	✓	Defendable 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/m^2).
➢ Provide appropriate separation between a hazard and buildings, which, in combination with other measures, prevent the likely fire spread to buildings	✓	Appropriate APZs are provided between the proposed 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.
➢ Ensure that safe operational access and egress for emergency service personnel and residents is available	✓	Public road access will be provided from newly constructed roads connected to the northern, eastern and western adjoining developments.
➢ Provide for ongoing management and maintenance of BPMs	✓	All owners will be responsible for the management and maintenance of the private property.
➢ Ensure that utility services are adequate to meet the needs of firefighters	✓	The development includes all essential utility services to meet the needs of firefighters; including a reliable water supply.

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 PS - Performance 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.	PS	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 5.0° downslope 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	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 four (4) access routes will be provided to the subdivision following completion of the first stage. Ultimately twelve (12) 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		

Intent of Measure	Performance Criteria	Acceptable Solution	Complies	Comment
			✓ - Acceptable Solution PS - Performance Solution	
accessing or egressing an area.		Traffic management devices are constructed to not prohibit access by emergency services vehicles.	✓	
		Access roads must provide suitable turning areas in accordance with Appendix 3.	✓	
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. All perimeter roads are a minimum 10.5m and up to 12m wide and are designed in accordance with the relevant PBP 2019 design requirements. It is recommended the RFS do not impose a condition requiring parking to be provided outside of the carriageway as the proposed development has a combination of 10.5m -12m wide perimeter roads. The contained bushfire hazard and the multiple evacuation routes result in a reduced risk of obstructions occurring to emergency services accessing the site.
		8m carriageway width kerb to kerb.	✓	
		Parking is provided outside of the carriageway.	PS	
		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.	✓	

Intent of Measure	Performance Criteria	Acceptable Solution	Complies	Comment
			✓ - Acceptable Solution PS - Performance Solution	
		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	✓	
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 non-perimeter roads are 8m wide will be constructed in accordance with PBP 2019. It is recommended the RFS do not impose a condition requiring parking to be provided outside of the carriageway as there evacuation routes in numerous directions allowing for a route away from a bushfire always in the opposite direction. The lower risk bushfire hazard and the multiple evacuation routes result in a reduced risk of obstructions occurring to emergency services accessing the site.
		Parking is provided outside of the carriageway.	**PS**	
		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 To provide adequate services for water for the protection of buildings during and after the passage of a bushfire, and not to locate gas and electricity so as not	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**	

Intent of Measure	Performance Criteria	Acceptable Solution	Complies	Comment
			✓ - Acceptable Solution PS - Performance Solution	
to contribute to the risk of fire to a building. **WATER**	Water supplies are located at regular intervals. The water supply is accessible and reliable for firefighting operations.	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;	✓	
		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	✓	Any new gas connections will be underground and will be unlikely to create an additional hazard risk to surrounding bushland.

Intent of Measure	Performance Criteria	Acceptable Solution	Complies	Comment
			✓ - Acceptable Solution PS - Performance Solution	
		authorities, metal piping is to be used.		
		All fixed gas cylinders are kept clear of all flammable materials to a distance of 10 metres 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.		

Appendix D: NBC Bushfire Attack Assessor V4.1 Results

NBC Bushfire Attack Assessment Report V4.1

AS3959 (2018) Appendix B - Detailed Method 2

Print Date: 9/05/2023 **Assessment Date:** 9/05/2023

Site Street Address: 2179 Harris Site (McFarlanes Rd), 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 North

Vegetation Information

Vegetation Type: Coastal Floodplain Wetlands
Vegetation Group: Forested Wetlands

Vegetation Slope: 2.2 Degrees **Vegetation Slope Type:** Downslope
Surface Fuel Load(t/ha): 8.2 **Overall Fuel Load(t/ha):** 15.1
Vegetation Height(m): 0.9 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):** 11

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):** 4.17
Radiant Heat(kW/m2): 29 **Flame Angle (degrees):** 64
Flame Length(m): 9.29 **Maximum View Factor:** 0.439
Rate Of Spread (km/h): 1.15 **Inner Protection Area(m):** 0
Transmissivity: 0.869 **Outer Protection Area(m):** 0
Fire Intensity(kW/m): 8935

BAL Thresholds

	BAL-40:	BAL-29:	BAL-19:	BAL-12.5:	10 kw/m2:	Elevation of Receiver:
Asset Protection Zone(m):	8	11	16	23	38	6

Run Description: T10 West

Vegetation Information

Vegetation Type: Hunter Macleay DSF

Vegetation Group: Dry Sclerophyll Forests (Shrub/Grass)

Vegetation Slope: 2 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: 0 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): 6.84

Radiant Heat(kW/m2): 29

Flame Angle (degrees): 62

Flame Length(m): 15.5

Maximum View Factor: 0.448

Rate Of Spread (km/h): 1.93

Inner Protection Area(m): 0

Transmissivity: 0.852

Outer Protection Area(m): 0

Fire Intensity(kW/m): 24512

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: T11 West

Vegetation Information

Vegetation Type: Hunter Macleay DSF

Vegetation Group: Dry Sclerophyll Forests (Shrub/Grass)

Vegetation Slope: 0 Degrees

Vegetation Slope Type: Level

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: 0 Degrees

Site Slope Type: Downslope

Elevation of Receiver(m): Default

APZ/Separation(m): 16

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): 6.18

Radiant Heat(kW/m2): 29

Flame Angle (degrees): 63

Flame Length(m): 13.87

Maximum View Factor: 0.446

Rate Of Spread (km/h): 1.68

Inner Protection Area(m): 0

Transmissivity: 0.856

Outer Protection Area(m): 0

Fire Intensity(kW/m): 21353

BAL Thresholds

	BAL-40:	BAL-29:	BAL-19:	BAL-12.5:	10 kw/m2:	Elevation of Receiver:
Asset Protection Zone(m):	12	16	23	32	50	6

Run Description: T12 West

Vegetation Information

Vegetation Type: Grassland

Vegetation Group: Grassland

Vegetation Slope: 1.7 Degrees

Vegetation Slope Type: Downslope

Surface Fuel Load(t/ha): 6

Overall Fuel Load(t/ha): 6

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): 11

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: 130

Program Outputs

Level of Construction: BAL 29

Peak Elevation of Receiver(m): 4.11

Radiant Heat(kW/m2): 29

Flame Angle (degrees): 64

Flame Length(m): 9.15

Maximum View Factor: 0.438

Rate Of Spread (km/h): 19

Inner Protection Area(m): 0

Transmissivity: 0.87

Outer Protection Area(m): 0

Fire Intensity(kW/m): 58910

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	0

Run Description: T13 & T14 South

Vegetation Information

Vegetation Type: Non-Hazard

Vegetation Group: Non-Hazard

Vegetation Slope: 2 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): 1

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): 0

Radiant Heat(kW/m2): 29

Flame Angle (degrees): 0

Flame Length(m): 0

Maximum View Factor: 0

Rate Of Spread (km/h): 0

Inner Protection Area(m): 0

Transmissivity: 0.905

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:	T15 East		
Vegetation Information			
Vegetation Type:	Grassland		
Vegetation Group:	Grassland		
Vegetation Slope:	1.5 Degrees	**Vegetation Slope Type:**	Downslope
Surface Fuel Load(t/ha):	6	**Overall Fuel Load(t/ha):**	6
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):**	11
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:**	130
Program Outputs			
Level of Construction:	BAL 29	**Peak Elevation of Receiver(m):**	4.08
Radiant Heat(kW/m2):	29	**Flame Angle (degrees):**	64
Flame Length(m):	9.09	**Maximum View Factor:**	0.438
Rate Of Spread (km/h):	18.74	**Inner Protection Area(m):**	0
Transmissivity:	0.87	**Outer Protection Area(m):**	0
Fire Intensity(kW/m):	58103		

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	0

Run Description:	T2 North		
Vegetation Information			
Vegetation Type:	Hunter Macleay DSF		
Vegetation Group:	Dry Sclerophyll Forests (Shrub/Grass)		
Vegetation Slope:	3.3 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:	0 Degrees	**Site Slope Type:**	Downslope
Elevation of Receiver(m):	Default	**APZ/Separation(m):**	19
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):**	7.36
Radiant Heat(kW/m2):	29	**Flame Angle (degrees):**	62
Flame Length(m):	16.67	**Maximum View Factor:**	0.45
Rate Of Spread (km/h):	2.11	**Inner Protection Area(m):**	0
Transmissivity:	0.848	**Outer Protection Area(m):**	0
Fire Intensity(kW/m):	26813		

BAL Thresholds

	BAL-40:	BAL-29:	BAL-19:	BAL-12.5:	10 kw/m2:	Elevation of Receiver:
Asset Protection Zone(m):	14	19	27	37	57	6

Run Description: T3 East

Vegetation Information

Vegetation Type: Hunter Macleay DSF

Vegetation Group: Dry Sclerophyll Forests (Shrub/Grass)

Vegetation Slope: 4.6 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: 0 Degrees

Site Slope Type: Downslope

Elevation of Receiver(m): Default

APZ/Separation(m): 20

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): 7.93

Radiant Heat(kW/m2): 29

Flame Angle (degrees): 62

Flame Length(m): 17.97

Maximum View Factor: 0.451

Rate Of Spread (km/h): 2.31

Inner Protection Area(m): 0

Transmissivity: 0.845

Outer Protection Area(m): 0

Fire Intensity(kW/m): 29329

BAL Thresholds

	BAL-40:	BAL-29:	BAL-19:	BAL-12.5:	10 kw/m2:	Elevation of Receiver:
Asset Protection Zone(m):	15	20	28	39	60	6

Run Description:	T4 East		
Vegetation Information			
Vegetation Type:	Grassland		
Vegetation Group:	Grassland		
Vegetation Slope:	0.5 Degrees	**Vegetation Slope Type:**	Upslope
Surface Fuel Load(t/ha):	6	**Overall Fuel Load(t/ha):**	6
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):**	10
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:**	130
Program Outputs			
Level of Construction:	BAL 29	**Peak Elevation of Receiver(m):**	3.81
Radiant Heat(kW/m2):	29	**Flame Angle (degrees):**	64
Flame Length(m):	8.48	**Maximum View Factor:**	0.437
Rate Of Spread (km/h):	16.33	**Inner Protection Area(m):**	0
Transmissivity:	0.872	**Outer Protection Area(m):**	0
Fire Intensity(kW/m):	50613		

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	0

Run Description:	T5 On-Site		
Vegetation Information			
Vegetation Type:	Coastal Floodplain Wetlands		
Vegetation Group:	Forested Wetlands		
Vegetation Slope:	0.2 Degrees	**Vegetation Slope Type:**	Upslope
Surface Fuel Load(t/ha):	8.2	**Overall Fuel Load(t/ha):**	15.1
Vegetation Height(m):	0.9	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):**	10
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):**	3.65
Radiant Heat(kW/m2):	29	**Flame Angle (degrees):**	64
Flame Length(m):	8.12	**Maximum View Factor:**	0.437
Rate Of Spread (km/h):	0.97	**Inner Protection Area(m):**	0
Transmissivity:	0.873	**Outer Protection Area(m):**	0
Fire Intensity(kW/m):	7572		

BAL Thresholds

	BAL-40:	BAL-29:	BAL-19:	BAL-12.5:	10 kw/m2:	Elevation of Receiver:
Asset Protection Zone(m):	6	9	14	20	34	6

Run Description:	T6 On-site		
Vegetation Information			
Vegetation Type:	Coastal Floodplain Wetlands		
Vegetation Group:	Forested Wetlands		
Vegetation Slope:	2.3 Degrees	**Vegetation Slope Type:**	Upslope
Surface Fuel Load(t/ha):	8.2	**Overall Fuel Load(t/ha):**	15.1
Vegetation Height(m):	0.9	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):**	9
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):**	3.27
Radiant Heat(kW/m2):	29	**Flame Angle (degrees):**	64
Flame Length(m):	7.27	**Maximum View Factor:**	0.435
Rate Of Spread (km/h):	0.84	**Inner Protection Area(m):**	0
Transmissivity:	0.876	**Outer Protection Area(m):**	0
Fire Intensity(kW/m):	6550		

BAL Thresholds

	BAL-40:	BAL-29:	BAL-19:	BAL-12.5:	10 kw/m2:	Elevation of Receiver:
Asset Protection Zone(m):	5	8	12	18	31	6

Run Description:	T7 West		
Vegetation Information			
Vegetation Type:	Grassland		
Vegetation Group:	Grassland		
Vegetation Slope:	2.3 Degrees	**Vegetation Slope Type:**	Upslope
Surface Fuel Load(t/ha):	6	**Overall Fuel Load(t/ha):**	6
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):**	10
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:**	130
Program Outputs			
Level of Construction:	BAL 29	**Peak Elevation of Receiver(m):**	3.58
Radiant Heat(kW/m2):	29	**Flame Angle (degrees):**	64
Flame Length(m):	7.97	**Maximum View Factor:**	0.436
Rate Of Spread (km/h):	14.42	**Inner Protection Area(m):**	0
Transmissivity:	0.874	**Outer Protection Area(m):**	0
Fire Intensity(kW/m):	44702		

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	0

Run Description:	T8 West		
Vegetation Information			
Vegetation Type:	Grassland		
Vegetation Group:	Grassland		
Vegetation Slope:	0.2 Degrees	**Vegetation Slope Type:**	Upslope
Surface Fuel Load(t/ha):	6	**Overall Fuel Load(t/ha):**	6
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):**	10
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:**	130
Program Outputs			
Level of Construction:	BAL 29	**Peak Elevation of Receiver(m):**	3.85
Radiant Heat(kW/m2):	29	**Flame Angle (degrees):**	64
Flame Length(m):	8.57	**Maximum View Factor:**	0.437
Rate Of Spread (km/h):	16.67	**Inner Protection Area(m):**	0
Transmissivity:	0.872	**Outer Protection Area(m):**	0
Fire Intensity(kW/m):	51672		

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	0

Run Description: T9 West

Vegetation Information

Vegetation Type: Hunter Macleay DSF

Vegetation Group: Dry Sclerophyll Forests (Shrub/Grass)

Vegetation Slope:	3.7 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:	0 Degrees	**Site Slope Type:**	Downslope
Elevation of Receiver(m):	Default	**APZ/Separation(m):**	19

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

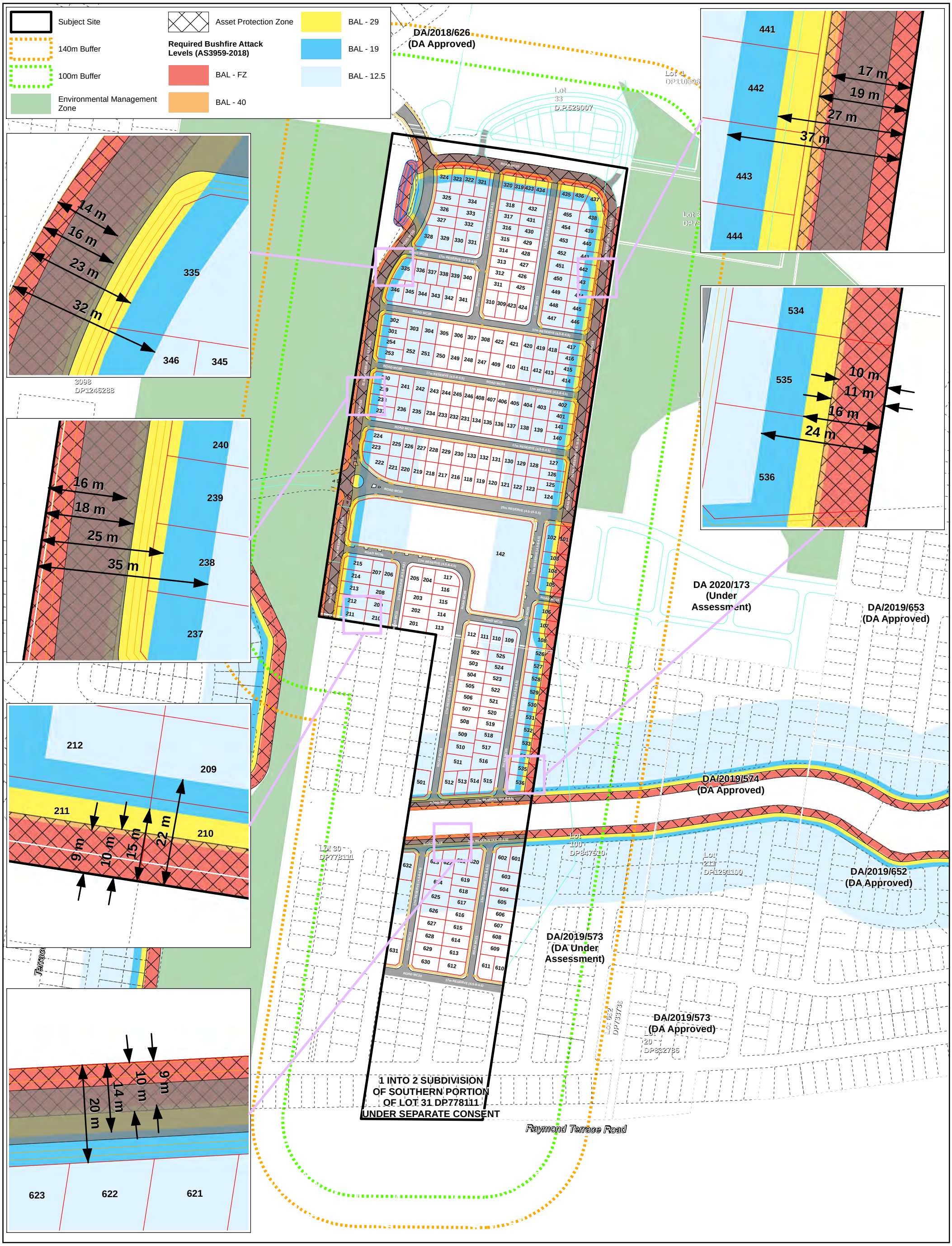
Program Outputs

Level of Construction:	BAL 29	**Peak Elevation of Receiver(m):**	7.53
Radiant Heat(kW/m2):	29	**Flame Angle (degrees):**	62
Flame Length(m):	17.06	**Maximum View Factor:**	0.45
Rate Of Spread (km/h):	2.17	**Inner Protection Area(m):**	0
Transmissivity:	0.847	**Outer Protection Area(m):**	0
Fire Intensity(kW/m):	27563		

BAL Thresholds

	BAL-40:	BAL-29:	BAL-19:	BAL-12.5:	10 kw/m2:	Elevation of Receiver:
Asset Protection Zone(m):	15	19	27	38	58	6

Appendix E: Subdivision BAL Plan



BUSHFIRE PLANNING AUSTRALIA

Source:	Cadastral Boundary: NSW Department of Finance, Services and Innovation 2021
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File:	File: 2179-McFarlanesRd-Fig8-BALs-PERMANENT-230519 Date: 19/05/2023

0 50 100 150
Meters

A3 Scale: 1:4,500

Coordinate System: GDA 1994 MGA Zone 56

Project: 173 McFarlanes Road, Chisholm
Job no: 2179

Subdivision BAL Plan - Permanent