Bushfire Assessment Report
Performance Based

Proposed Residential Subdivision

442 Louth Park Road
Louth Park

Prepared for
Newpro25 Pty Ltd

19 October 2022

Version V1.0

COOL BURN
FIRE + ECOLOGY

BPAD
Bushfire
Planning & Design
Accredited Practitioner
Level 3

Project Details

Project Name:	J105 – Proposed Residential Subdivision, Louth Park Performance Based – Short Fire Run
Client Details:	Newpro25 Pty Ltd
Project Address	442 Louth Park Road Louth Park NSW 2320
Lot & DP:	Lot 1 DP 221762
Local Government Area	Maitland City Council – Hunter Region (FDI 100)
Urban Release Area	Maitland URA #7 Louth Park
Zoning (MCC LEP)	R5 Large Lot Residential
Bushfire Prone Land	Cat 1 bushfire prone vegetation
Proposed Development	31 Lot Residential Subdivision
Approval Path	BFSA - Council Development Application (DA)
Building Classification	Residential Development – Class 1-4 Structures

Document Control

Version	Primary Author(s)	Description	Date Completed
V1.0	Dan Pedersen	Draft	
V1.1	Dan Pedersen BPAD16293	Final	19 October 2022

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B.Sc. (ecology), Grad. Dip. (Design for Bush fires)
Fire Protection Association of Australia BPAD Level 3 BPD-PA 16293

Contents

Executive Summary

This bushfire assessment for the proposed 32 Lot Large Lot Residential development at Stage 1 442 Louth Park Road is a 'performance-based assessment' as the fire behaviour modelling has used:

- Modified fuel loading for Hunter Macleay Dry Sclerophyll Forest vegetation classification (NSW RFS Comprehensive Fuel Load, March 2019)
- Short fire run (SFR) consistent with *A1.11.2* of Planning for Bushfire Protection (PBP 2019).

The proposal to apply SFR to assess the hazard to the east is deemed acceptable in principle by the NSW RFS (RFS Ref: PRE-DA20220623000111).

The proposed 31 Lot residential subdivision (subject site) is in the Louth Park Urban Release Area (URA) and is a staged extension of the existing Hillview Estate Large Lot Residential development currently under construction (west).

Accepted bushfire modelling (Method 2 AS3959:2018) has been applied to the vegetation type, effective slopes and SFR to determine a minimum asset protection zone (APZ) required to attain the required 29kW/m^2 (BAL29) threshold for each proposed Lot within the subdivision.

The proposed development includes a formal easement for APZ to the north (Cox Land) to benefit this proposed subdivision, being proposed 20m wide, which would be managed as an APZ in perpetuity, and until extinguished by future development occurs on adjacent land.

The Louth Park master plan design for Large Lot Residential will extend access through the subject site and the adjacent property to the south (526 Louth Park Road, Lot 412/DP854995) and link with Louth Park Road (east). This adjacent property (526 Louth Park Road) currently has a complementary development application with Maitland City Council for a subdivision and linking suitable access and reticulated water provisions throughout the subject site. Temporary turning heads are required as an interim access arrangement until thoroughfare is constructed.

It is considered that the proposed subdivision adequately considers bushfire risk and conforms to the specifications and performance criteria of PBP 2019, providing a suitable outcome commensurate with the bushfire risk, and a bushfire safety authority can be provided by the NSW RFS.

1. Introduction

Newpro25 Pty Ltd have commissioned Cool Burn Pty Ltd (Cool Burn) to prepare a Bushfire Assessment Report to support the Development Application (DA) for the proposed residential subdivision of the subject site, being land at 442 Louth Park Road, Louth Park **(Appendix 1 Figure 1)**, legally identified as Lot 1 DP 221762.

The subject site for this assessment is the Stage 1 Lot of the recently approved 'One into Two Lot Torrens Title Subdivision' of Lot 1 DP221762, 442 Louth Park Road, Louth Park (City of Maitland of Application No DA/2021/1391). The NSW RFS issued a BFSA on 15 February 2022 (*RFS Reference: DA20211118005021-Original-1*).

This Bushfire Assessment Report analyses the bushfire matters pertaining to the site, including fire behaviour associated with potential short fire run (SFR), vegetation fuel loads and slope assessments (a performance-based assessment), and the ability to address bushfire issues and achieve compliance with *Planning for Bushfire Protection 2019*. This performance-based assessment has sought pre-DA advice (RFS Ref: PRE-DA20220623000111).

Under the *Rural Fires Act 1997* (RFA) residential subdivision developments are identified as integrated development, and a Bush Fire Safety Authority (BFSA) is required under s100B of the RFA, and any development application must therefore be referred to the NSW RFS.

Planning for Bush Fire Protection (PBP 219) states that "*subdivision of land is the creation of lots for residential or rural residential purposes. Where a new dwelling entitlement is created, it is important to ensure that appropriate Bushfire Protection Measures are provided within the new allotment. This allows for protection measures to be fully incorporated at the design stage of development.*"

To satisfy bushfire risk and protection requirements, Cool Burn have reviewed and applied the following guidelines and standards:

- Chapter 5 - Planning for Bushfire Protection 2019 (PBP 2019).

This assessment has been prepared by a suitably qualified bushfire practitioner, Dan Pedersen (BPAD Level 3 BPAD 16293).

1.1. Location

Louth Park is located south of Maitland, east from Gillieston Heights and west of East Maitland.

The subject site and surrounding land is mapped within the Louth Park urban release area (URA).

The locality has direct access links to Maitland via Louth Park Road, East Maitland and the Hunter Expressway via Buchanan Road.

Louth Park locality is predominantly constructed and occupied (or planned for) Large Lot Residential development.

1.2.Development

The former existing residential allotment (Lot 1 DP 221762) was subdivided into two Lots (see Appendix 1 Site Plans, reference to City of Maitland of Application No DA/2021/1391). These Lots are referred to as:

- Cox Land (north) and
- Stage 1 (south), the subject site.

The new Lot (Stage 1) is the focus of this assessment.

Stage 1 is proposed to be further subdivided in to 31 Large Lot Residential lots, including the construction of the public road (and services) that will extend from the existing Hillview Estate Large Lot Residential development to the west (currently under construction), with provision to extend east to Louth Park Road through the proposed development of Lot 412/DP854995, 526 Louth Park Road (see Appendix 1 Site Plans) and potentially north through Cox Land, when future staged development in the URA commences.

Surrounding landscape assessment includes:

North: The Cox Land has an existing dwelling and associated landscape management, including a proposed easement for an asset protection zone (APZ) to benefit the development on the subject site.

East: Rural residential properties on Louth Park Road border the subject site to the east. These Lots have been progressively subdivided and developed for large lot residential style living, reducing and fragmenting the extent of the mapped forest vegetation. A riparian zone (drainage line) separates the existing dwellings from the subject site.

West: The subject site has is bordered to the west by an existing Large Lot Residential development under construction, and the existing public road (Collaroy Parade) will provide access and services to this new development stage.

South: The land to the south of the subject site (526 Louth Park Road, Lot 412 DP854995) has a current proposed DA for a 22 Large Lot Residential subdivision (see Appendix 1 Site Plans).

1.3.Principal Building Characteristic

The proposed Large Lot Residential development would provide for BCA Class 1-4 buildings, residential occupancy.

1.4.Occupant Characteristic

The single residential dwelling is proposed for regular and standard residential purposes. There is no evidence that the land use and occupants would be considered as vulnerable to bushfire (i.e. mobility issues, specialised assistance required), and it is assumed that the residents would be able-bodied and capable of evacuation if required.

It is assumed that the residents are familiar with the building and the local area.

2. Legislative Framework

Development on land that is identified as being bushfire prone must comply with the NSW RFS document *Planning for Bushfire Protection* (PBP 2019) under s.4.46 of the *Environmental Planning and Assessment Act, 1997* (EPA Act).

The proposed residential subdivision development is categorised as Integrated Development, under s.4.46 of the EPA Act. Integrated development requires development consent from Council and General Terms of Approval from the NSW RFS. Any development applications for such a purpose must obtain a Bush Fire Safety Authority (BFSA) from the Commissioner of the NSW RFS in accordance with Section 100B of the RF Act.

A BFSA authorises development to the extent that it complies with PBP 2019 including standards regarding setbacks, provision of water supply and other measures in combination considered by the Commissioner necessary to protect persons, property or the environment from danger that may arise from a bushfire.

As a proposed residential development, the application needs to be able to justify that the proposal can achieve radiant heat levels of not greater than 29kW/m2 (or Bushfire Attack Level BAL 29) to all proposed dwellings and have adequate access and water supply provisions.

2.1.Short Fire Run

The size and shape of small areas of vegetation influences the behaviour of bush fires and the associated risk to the built environment. Small or narrow parcels of vegetation have less opportunity to support fully developed bush fires because of their limited size.

Such small or narrow parcels of vegetation are referred to as a short fire run (SFR). The NSW RFS have been consulted for their agreement that the SFR approach is appropriate for the parcels being considered (RFS Ref: PRE-DA20220623000111).

Assessment of SFRs is undertaken by determining the reduced head fire width and flame length of the SFR, as appropriate, then calculating the amount of radiant heat impacting the site. From this modelling, APZs may be calculated which are less than those required for larger bushland parcels or those detailed in the simplified approach of PBP. The SFR method is based on AS 3959 Method 2.

Proposals for the SFR methodology need to be prepared as a performance-based solution is prepared consistent with the bushfire design brief (BFDB) process.

2.2.Bushfire Prone Land

Bushfire prone land maps provide a trigger for the development assessment provisions and consideration of sites that are bushfire prone. Bushfire prone land (BFPL) is land that has been identified by council and certified by the Commissioner of the RFS, which can support a bushfire or is subject to bushfire attack.

The site is identified as 'bushfire prone land' as mapped by Council for the purposes of Section 10.3 of the EPA Act and the legislative requirements for building on bushfire prone lands are applicable. **Appendix 1 Figure 2** shows the Bush Fire Prone vegetation mapping.

2.3.Planning for Bushfire Protection 2019

All development on Bushfire Prone Land must comply with PBP 2019. A new version of the document was gazetted on 1 March 2020 and all new development must meet the requirements of this document.

The development will be assessed against Chapter 5 of PBP 2019, which details the performance criteria and a set of acceptable solutions (if these solutions can be demonstrated, the assessment is deemed to satisfy the RFS requirements for a BFSA).

Performance-Based Solution

This Bushfire Assessment Report is considered to be a performance-based assessment for the following reasons:

- The assessment uses the modified fuel load as detailed in NSW Rural Fire Service – Comprehensive Vegetation Fuel Loads (NSW RFS, March 2019)
- Short fire run (SFR) consistent with *A1.11.2* of Planning for Bushfire Protection (PBP 2019).

General Objectives of Planning for Bushfire Protection

All development on BFPL must satisfy the aim and objectives of PBP 2019. The aim of PBP 2019 is to provide for the protection of human life and minimise impacts on property from the threat of bushfire, while having due regard to development potential, site characteristics and protection of the environment. The objectives are to:

I. afford buildings and their occupants protection from exposure to a bush fire;

II. *provide for a defendable space to be located around buildings;*

III. *provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent the likely fire spread to buildings;*

IV. *ensure that appropriate operational access and egress for emergency service personnel and occupants is available;*

V. *provide for ongoing management and maintenance of BPMs; and*

VI. *ensure that utility services are adequate to meet the needs of firefighters.*

Specific Objectives for Residential Subdivision

The specific objectives for residential subdivisions (PBP 2019) with a dwelling entitlement are as follows:

- *minimise perimeters of the subdivision exposed to the bush fire hazard (hourglass shapes, which maximise perimeters and create bottlenecks should be avoided);*
- *minimise vegetated corridors that permit the passage of bush fire towards buildings;*
- *provide for the siting of future dwellings away from ridge-tops and steep slopes, within saddles and narrow ridge crests;*
- *ensure that APZs between a bush fire hazard and future dwellings are effectively designed to address the relevant bush fire attack mechanisms;*
- *ensure the ongoing maintenance of APZs;*
- *provide adequate access from all properties to the wider road network for residents and emergency services;*
- *provide access to hazard vegetation to facilitate bush fire mitigation works and fire suppression; and*
- *ensure the provision of an adequate supply of water and other services to facilitate effective firefighting.*

3. Bushfire Risk Assessment

3.1. Fire Weather

The fire weather is determined by PBP 2019 and assumes a credible worst-case scenario and an absence of any other mitigating factors relating to aspect or prevailing winds.

The site in the Hunter district has a Fire Danger Index (FDI) of 100 and a Grassland Fire Danger Index (GFDI) 130 as per PBP 2019.

3.2. Vegetation Assessment

The bushfire behavior assessment methodology assesses the vegetation classification on and surrounding the area proposed for residential dwellings (out to 140 metres) in accordance with the system for classification of vegetation contained in PBP 2019. Predominant Vegetation is classified by structure or formation using the system adopted by Keith (2004) and by the general description using PBP 2019 (see **Appendix 1 Figure 3)**.

North: The vegetation to the north (Cox Land) is classified as Hunter Macleay Dry sclerophyll Forest (DSF).

Plate 1: Cox Land north

East: The bushfire prone vegetation to the east is classified as Hunter Macleay Dry sclerophyll Forest (DSF).

The vegetation is on a drainage line and support riparian functions including multiple small dams and open drainage lines, features that further fragment the tree canopy, supporting the assumption of potential short fire run, low risk bush fires, and canopy fires will not be sustained.

The vegetation on north eastern property at 470 Louth Park Road (Lot 61 DP825042) is managed grasslands and does not constitute a significant hazard (Plate 2-3).

The vegetation on 492 and 498 Louth Park Road (Plate 4-5) is being managed for existing rural residential dwellings resulting in relatively fragmented and narrow vegetation parcels.

To the southeast on 520 Louth Park Road (Lot 4 DP1247200), the whole Lot has been managed as IPA with the exception of the10m wide riparian corridor as per City of Maitland DA/2020/71, Condition 22 and NSW RFS conditions (NSW RFS Ref: D16/1144_DA16041501530 JC).

The level of management in the vegetation on Lots to the east is consistent with the urban development in the locality, which restricts bushfire fuel build up potential fire runs (less than 150m) and maintains a lower fire risk. The determination of Hunter Macleay DSF and SFR should be considered an acceptable and conservative vegetation classification.

Plate 2: Grassland managed on 470 Louth Park Road

Plate 3: Grassland managed on 470 Louth Park Road

Plate 4: Rural residential managed on 492 Louth Park Road

Plate 5: Remnant (managed) on corner of 498 and 520 Louth Park Road

Plate 6: Managed IPA on 520 Louth Park Road

West: Land within 140m to the west of the subject site is largely developed and managed within The Hillview Estate residential landscape and does not constitute a potential bushfire vegetation hazard (Plate 7).

Plate 7: Hillview Estate west (looking north)

South: The current vegetation to the south (and southwest) is classified as Hunter Macleay Dry sclerophyll Forest (DSF) and grassland (Plate 8) but is assumed it will be cleared and managed for future residential subdivision on adjacent land.

Plate 8: Grassland/woodland south to be cleared for future subdivision

3.3.Slopes Influencing Bushfire Behavior

The bushfire behavior assessment methodology assesses the slope of the land on and surrounding the property, out to 100 metres from the boundaries of the proposed development (dwelling) footprint **(Appendix 1 Figure 3)**.

North: The slope to the north (Cox Land) is 1.15° downslope.

East: The vegetation to the east, measured over the distance of 100m, is averaged at 2.29° downslope.

West: The slopes to the west are upslope and non-vegetated.

South: The vegetation to the south (and southwest) typically upslope/flat, but assumed as non-vegetated for future development.

3.4.Bushfire Analysis Summary

Table 1 details the vegetation and topography analysis used for this assessment.

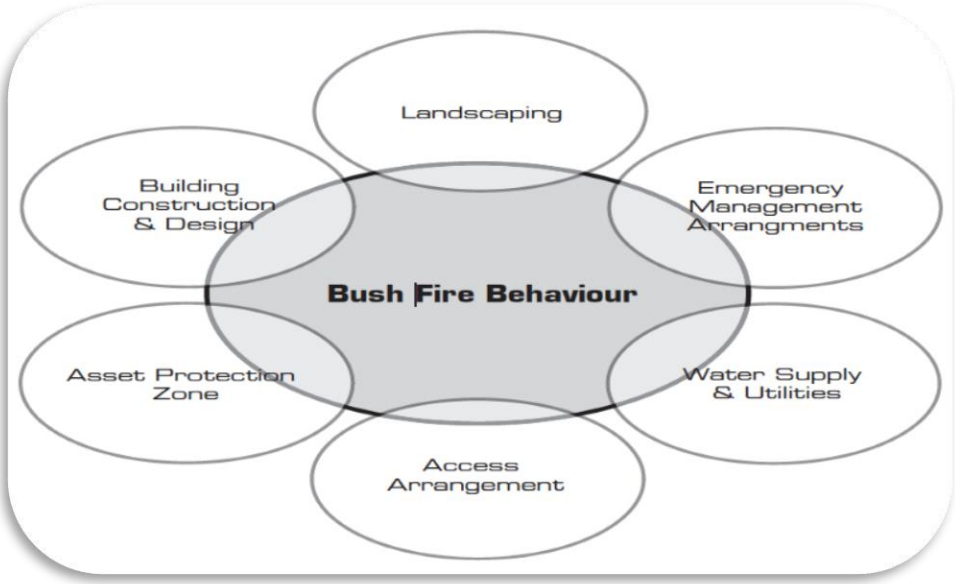
Table 1 Bushfire analysis summary

Direction	Vegetation	Fire Run	Slope
North	Hunter Macleay DSF	>150m	1.15^0 downslope
East	Hunter Macleay DSF	<150 (**SFR**)	2.29^0 downslope
West	Non-vegetated	n/a	n/a
South	Non-vegetated	n/a	n/a

4. Recommended Bushfire Protection Measures

The BPMs for residential subdivision development include provisions relating to APZs, access, water supply, electricity and gas services, construction standards, landscaping, and emergency evacuation (Plate 9).

Plate 9 Bushfire Protection Measures



4.1. BPM - Asset Protection Zones

Asset Protection Zones (APZ) have been considered commensurate with the bushfire risk and environmental impacts. The APZ is a fuel-reduced, physical separation between structures and bushfire hazards.

The proposed APZ have been assessed using:

- a lower fuel load consistent with Hunter Macleay DSF, as per the Comprehensive Vegetation Fuel Loads (NSW RFS March 2019);
- SFR consistent with Methodology for Assessing Bush Fire Risk for Low Risk Vegetation (NSW RFS Community Resilience, May 2019).

Bushfire models have been provided in **Appendix 2**, and APZ over the proposed development site detailed in **Appendix 1 Figure 4**. The APZ will be consistent with PBP 2019 requirements to achieve at minimum BAL 29 construction standards for a potential dwelling at each proposed Lot.

North: The development will provide a 20m wide easement for APZ to the north (Cox Land) to benefit this proposed subdivision. The easement needs to be supported at a minimum by a statement of intent from the adjacent landowner (Cox Land) to amend the title deed to include an easement for APZs (20m), which would be managed as an APZ in perpetuity, and until extinguished by future development:

- BALFZ = 0-13m
- BAL40 = 13-17m
- BAL29 = 17-24m
- BAL19 = 24-34m
- BAL12.5 = 34-100m

East: Based on the modelling of SFR/Hunter Macleay DSF and 2.29^0 effective slope: APZ of 12m can be implemented on all Lots interfacing the subject site eastern boundary:

- BALFZ = 0-9m
- BAL40 = 9-12m
- BAL29 = 12-17m
- BAL19 = 17-24m
- BAL12.5 = 24-100m

West: Not required (non-vegetated), developed and assuming future development approval

South: Not required (non-vegetated), assuming future development approval.

4.2.BPM - Landscaping

The assessment assumes that the APZ would be managed to the prescribed APZ standards for inner protection zone (IPA), in accordance with the requirements of Appendix 4 of PBP:

There are no constraints or impacts to continued management of the proposed lots to this standard.

To manage bushfire risk in perpetuity, each Lot for the proposed development must maintain landscaping to satisfy a low threat vegetation structure, equivalent to APZ. When establishing and maintaining landscaping on each proposed Lot, the following requirements apply:

- tree canopy cover should be less than 15% at maturity;

- trees at maturity should not touch or overhang the building;
- lower limbs should be removed up to a height of 2m above the ground;
- tree canopies should be separated by 2 to 5m;
- preference should be given to smooth barked and evergreen trees;
- large discontinuities or gaps in vegetation should be provided to slow down or break the progress of fire towards buildings;
- shrubs should not be located under trees;
- shrubs should not form more than 10% ground cover clumps of shrubs should be separated from exposed windows and doors by a distance of at least twice the height of the vegetation.
- grass should be kept mown (as a guide grass should be kept to no more than 100mm in height); and
- leaves and vegetation debris should be removed.

4.3.BPM - Construction

The Bushfire Attack Level (BAL) is a means of measuring the ability of a building to withstand attack from bushfire as defined in *Australian Standard AS 3959-2009 Construction of buildings in bushfire-prone areas* (AS 3959-2018).

All Lots within the proposed subdivision demonstrate the capability to provide a building envelope that does not exceed BAL29.

As Lots extend further away from the hazard, the BAL levels decrease. Future development can rely on the BAL contour mapping provided in **Appendix 1 Figure 4**, which represents the BAL levels across the development site.

4.4.BPM - Access

Public Road: The URA concept plan identifies continuation of Collaroy Parade (the main thoroughfare access through Hillview Estate) which would link Dagworth Road (north) and Louth Park Road (east). The completed Collaroy Parade thoroughfare to Louth Park Road will be provided through this current stage of development and the similar proposed development located south on adjacent land Lot 412 DP854995 (Appendix 1 site Plan Lot 412 DP854995).

For the purpose of this assessment, Collaroy Parade enters this proposed Stage from the west and will end at the southern boundary until future development. Collaroy Parade is a 11m wide, two-way sealed public road (Plate 10). Collaroy Parade will be a designated bus route, and the proposed extensions will be consistent with the existing Hillview Estate. This road design will have capacity to carry fully loaded firefighting vehicles and is considered adequate for simultaneous evacuation and fire suppression.

Two non-perimeter roads public roads for this stage (Eldon Drive and 'Road 10' cul-de-sac) have been designed to PBP specifications, each supporting an 8m wide sealed carriageway kerb to kerb and have capacity to provide parking outside a minimum 5.5m carriageway width. These road design specifiactions are consistent with the existing Hillview Estate.

- Eldon Road is a no-though-road at this stage, but the URA concept plan identifies through road access to the north (through Cox's Land) to the existing Eldon Drive in Hillview Estate further to the north. A temporary turning head will be Eldon Drive as an interim arrangement until future thoroughfare to the existing Eldon Drive is constructed (see Appendix 1 turning head design).
- Road 10 extends for less than 100m from Collaroy Parade and provides a suitable 12m diameter turning circle.

Plate 10: Collaroy Road constructed west

In summary, the public road design for this staged subdivision provides acceptable solutions and complies with the performance criteria requirements of Table 5.3b of PBP.

Property Access: Each property access would have capacity to provide a 4m wide carriageway and minimum 4m clearance to overhanging obstructions, and suitable turning area in accordance with Appendix 3 of PBP 2019.

Access can be sealed or unsealed as no sections will exceed 10 degrees.

The proposed access design for this subdivision site can meet the PBP 2019 access performance criteria requirements, and will provide firefighting vehicles are provided with safe, all-weather access to structures.

There are no specific access requirements in an urban area where an unobstructed path (no greater than 70m) is provided between the most distant external part of the proposed dwelling and the nearest part of the public access road (where the road speed limit is not greater than 70kph) that supports the operational use of emergency firefighting vehicles.

4.5. BPM - Water and Services

The proposed development would provide a reticulated water supply for each Lot that supports firefighting purposes in accordance with Table 5.3c of PBP:

- fire hydrant, spacing, design and sizing complies with the relevant clauses of Australian Standard AS2419.1:2005;
- hydrants are and not located within any road carriageway;
- reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter roads;
- fire hydrant flows and pressures comply with the relevant clauses of AS 2419.1:2005;
- all above-ground water service pipes are metal, including and up to any taps;
- where practicable, electrical transmission lines are underground;
- where overhead, electrical transmission lines are proposed as follows

It is recommended electricity and gas will be installed to relevant standards and will limit the possibility of ignition of surrounding bushland or the fabric of buildings.

5. Recommendations and Conclusion

This Bushfire Assessment Report details a performance-based assessment for the proposed large lot residential subdivision of Stage 1 at 442 Louth Park Road, Louth Park, and demonstrates how the proposal can achieve acceptable solutions for performance consistent with the NSW RFS PBP 2019.

The following recommendations have been made for this site:

- Hunter Macleay DFS vegetation is the most suitable vegetation classification for this site
- The vegetation to the east is partially managed and fragmented, resulting in a narrow remnant and constitutes a SFR
- The development will attain a 20m wide easement for APZ to the north (Cox Land) to benefit this proposed subdivision, and will be supported by a statement of intent to amend the title deed to include the easement for APZ be managed as an APZ in perpetuity, and until extinguished by future development
- APZ **north**: a minimum 17m APZ can be provided, including approved easement on Cox Land,
- APZ **east**: Minimum 12m APZ to east (based on SFR modelling)
- APZ **south** and **west**: no APZ required due to current and future developments
- Landscaping – Each Lot will require ongoing landscape management to specifically APZ standards (Appendix 4 PBP)
- Public road access to extend from west via Collaroy Parade (a 11m wide sealed road) through to Louth Park Road, through the proposed development on adjacent property south Lot 412 DP854995
- Temporary turning heads will be required as an interim access arrangement until throughfare to Louth Park Road and Eldon Drive is constructed
- Reticulated water supply to be provided; fire hydrant, spacing, design and sizing will comply with the relevant clauses of Australian Standard AS2419.1:2005
- Electricity & gas to be installed to relevant standards and Section 5.3.3 of PBP 2019.

It is considered that the proposed subdivision adequately considers bushfire risk and conforms to the specifications and performance criteria of PBP 2019, providing a suitable outcome commensurate with the bushfire risk.

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6. Assessment Against the Aims and Objectives of PBP

The bushfire assessment identifies the extent to which the proposed residential subdivision development conforms with or deviates from the aims and specific objectives set out in PBP 2019. Table 2 details the compliance with PBP aims and objectives.

Table 2 Compliance with Aim & Objectives of PBP

Aim	Meets Aim	Comment
to provide for the protection of human life and minimise impacts on property from the threat of bush fire, while having due regard to development potential, site characteristics and protection of the environment.	Yes	The location of the proposed development has considered bushfire risk and applied relevant bushfire protection measures to mitigate bushfire impact, commensurate with the risk
General Objectives	**Meets Objective**	**Comment**
afford buildings and their occupants protection from exposure to a bush fire;	Yes	The proposed development is afforded acceptable APZ protection and defendable space, commensurate to the risk
provide for a defendable space to be located around buildings;	Yes	Design will provide for a defendable space
provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent the likely fire spread to buildings;	Yes	Setbacks to achieve <BAL29 and construction commensurate with assessed risk
ensure that appropriate operational access and egress for emergency service personnel and occupants is available;	Yes	Access will be provided to acceptable PBP2019 standards, with provision of the Collaroy Parade extension through to Louth Park Road, based on development on adjacent property Lot 412 DP854995
provide for ongoing management and maintenance of BPMs; and	Yes	Bushfire management and maintenance responsibility contained within the site and agreed easement to the north on Cox Land
ensure that utility services are adequate to meet the needs of firefighters.	Yes	Water and services will be provided to acceptable PBP2019 standards
Specific Objectives	**Meets Objective**	**Comment**
minimise perimeters of the subdivision exposed to the bush fire hazard (hourglass shapes, which maximise perimeters and create bottlenecks should be avoided);	Yes	Simple design

minimise vegetated corridors that permit the passage of bush fire towards buildings;	Yes	No vegetation corridors and ongoing rural management required
provide for the siting of future dwellings away from ridge-tops and steep slopes, within saddles and narrow ridge crests;	Yes	Dwellings avoid ridgetops and steep slopes, saddles, or crests
ensure that APZs between a bush fire hazard and future dwellings are effectively designed to address the relevant bush fire attack mechanisms;	Yes	APZ designed to BAL29 or less at every proposed Lot
ensure the ongoing maintenance of APZs;	Yes	Bushfire management and maintenance responsibility contained within the site (and agreed easement to the north on Cox Land)
provide adequate access from all properties to the wider road network for residents and emergency services;	Yes	Access will be provided to acceptable PBP2019 standards (with provision of the Collaroy Parade extension)
provide access to hazard vegetation to facilitate bush fire mitigation works and fire suppression; and	Yes	Access will be provided to acceptable PBP2019 standards (with provision of the Collaroy Parade extension)
ensure the provision of an adequate supply of water and other services to facilitate effective firefighting.	Yes	Water and services will be provided to acceptable PBP2019 standards

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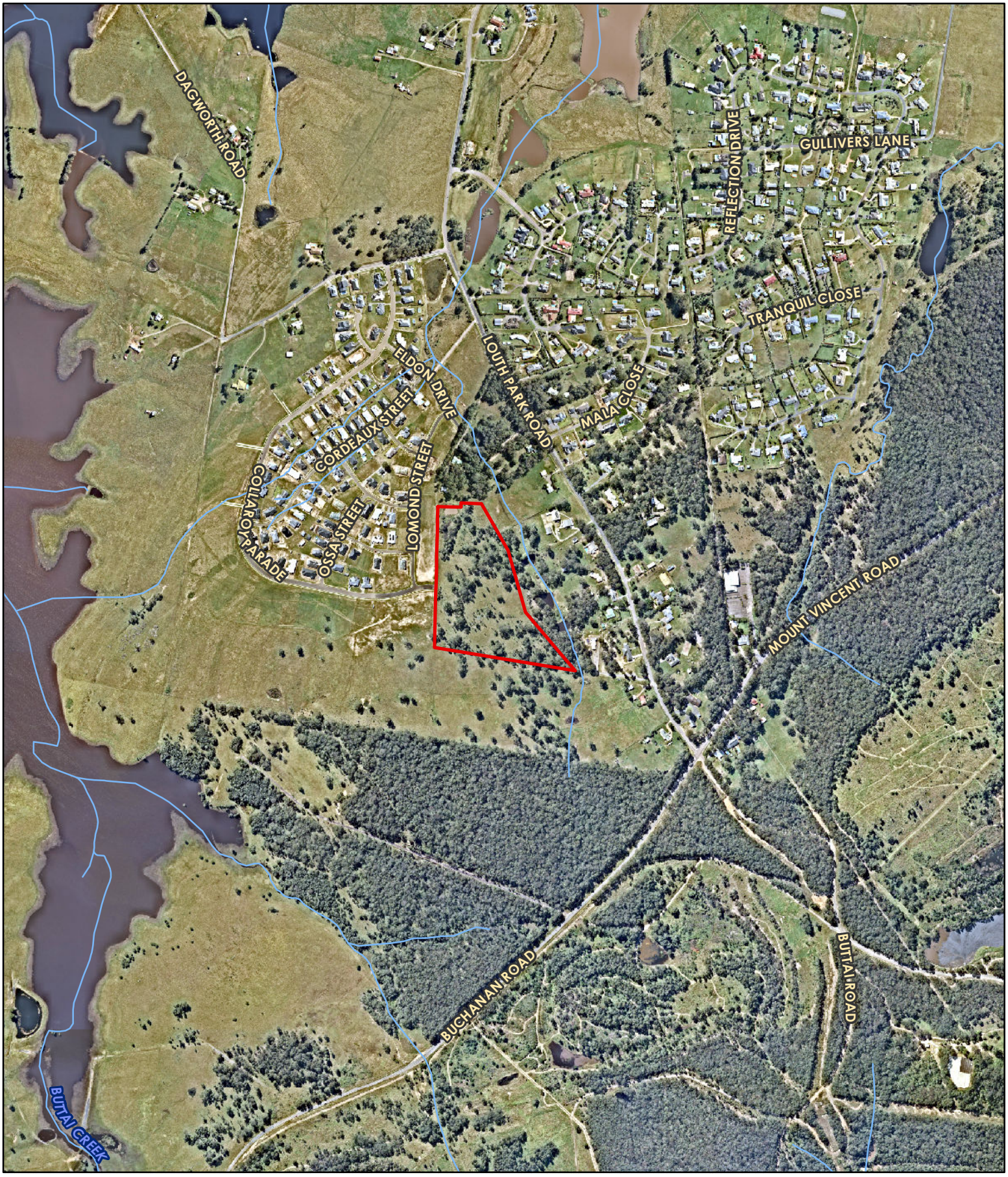
Appendix 1 Site Plans and Proposed Development Site Mapping



Legend

Watercourse

Subject Land

Date: 30/05/2022

0 125 250

Meters

Imagery: © Nearmap

Coordinate System: GDA 1994 MGA Zone 56

N

DKGIS

Figure 1: Locality

Legend

- Watercourse
- Cadastre
- Subject Land

Bushfire Prone Land

- Vegetation Category 1
- Vegetation Category 3
- Vegetation Buffer

Date: 30/05/2022

0 125 250

Meters

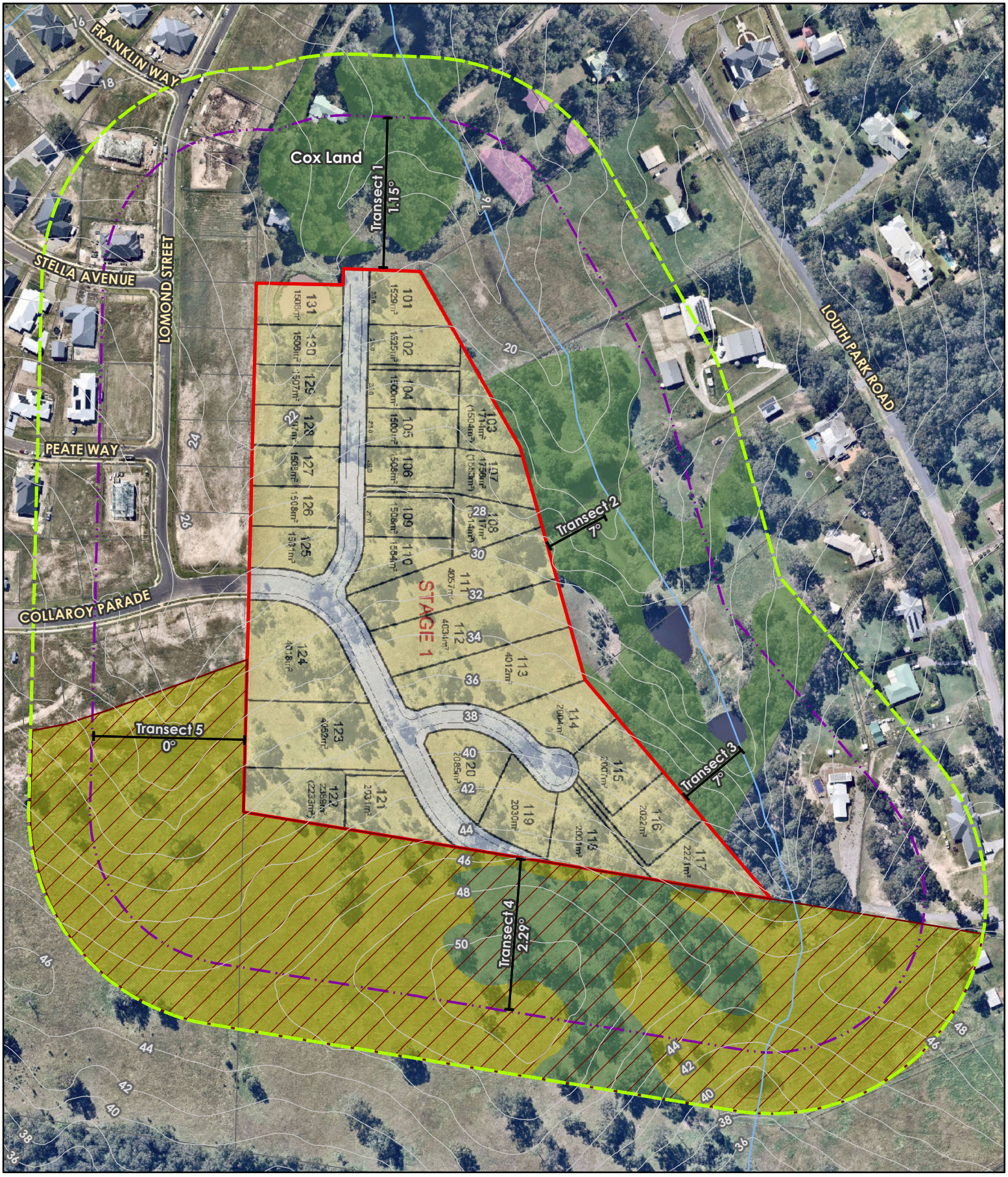
Imagery: © Nearmap

Coordinate System: GDA 1994 MGA Zone 56

N

DKGIS

Figure 2: Bushfire Prone Land



Legend

- Transect
- Contour - 2m
- Watercourse
- Subject to Future Development
- Slope Assessment Buffer - 100m
- Cadastre
- Vegetation Assessment Buffer - 140m
- Subject Land

Vegetation Formation

- Hunter-Macleay Dry Sclerophyll Forest
- Grassland
- Remnant/Low Hazard

Date: 28/06/2022

0 50 100
Meters

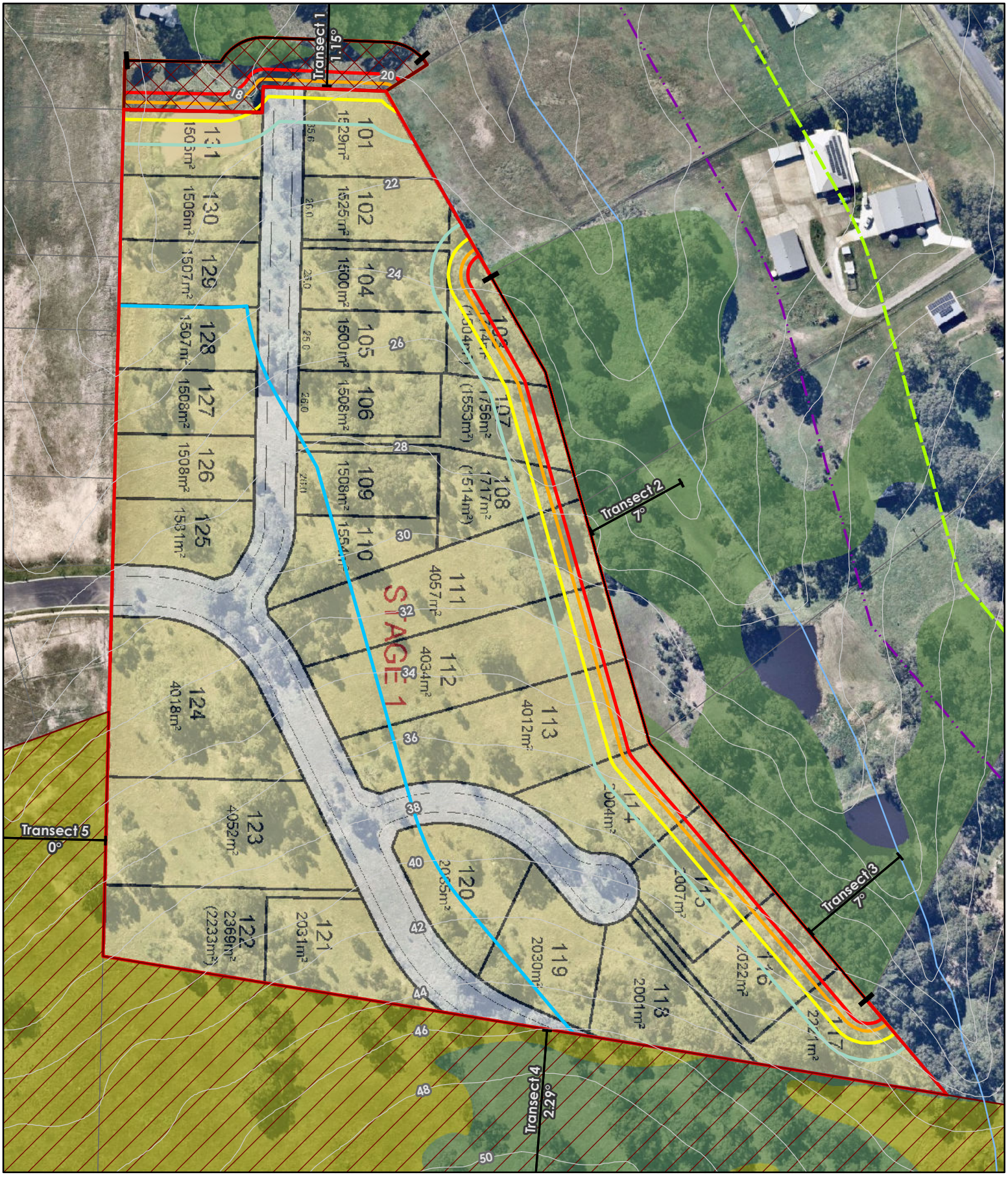
Imagery: © Nearmap

Coordinate System: GDA 1994 MGA Zone 56

N

DKGIS

Figure 3: Vegetation Formation



Legend

- Contour - 2m
- Watercourse
- Subject to Future Development
- Slope Assessment Buffer - 100m
- Cadastre
- Vegetation Assessment Buffer - 140m
- Subject Land
- Proposed APZ Easement - 20m

Vegetation Formation

- Hunter-Macleay Dry Sclerophyll Forest
- Grassland
- Remnant/Low Hazard

Bushfire Attack Level (BAL)

- BAL Flame Zone
- BAL 40
- BAL 29
- BAL 19
- BAL 12.5

Date: 28/06/2022

0 50 100
Meters

Imagery: © Nearmap

Coordinate System: GDA 1994 MGA Zone 56

N

DKGIS

Figure 4: Bushfire Attack Level

N

LEGEND

PROPOSED LOTS (STAGE 1) = 31

LOUTH PARK ROAD

5
DP 702764

61
DP 825042

62
DP 825042

63
DP 825042

412
DP 854995

3m WIDE TEMPORARY
EASEMENT FOR DRAINAGE

EXTENSION OF 15m WIDE
DRAINAGE EASEMENT

EXISTING EASEMENT TO
DRAIN WATER 15m WIDE

CREEK LINE

COX
LAND

STAGE 1

101 1529m²	102 1525m²	104 1500m²	105 1500m²	106 1508m²	109 1508m²	110 1554m²	111 4057m²	112 4034m²	113 4012m²	114 2004m²	115 2007m²	116 2022m²	117 2221m²	118 2001m²	119 2030m²	120 2085m²	121 2031m²	122 2369m² (2233m²)	123 4052m²	124 4018m²	125 1581m²	126 1508m²	127 1508m²	128 1507m²	129 1507m²	130 1506m²	131 1506m²	103 1714m² (1504m²)	107 1756m² (1553m²)	108 1717m² (1514m²)

3m WIDE TEMPORARY EASEMENT
FOR DRAINAGE LOCATED IN
EXISTING SHARED ACCESS PATH

ROAD 1

ROAD 2

ROAD 3

ROAD 4

ROAD 5

ROAD 8

PROPOSED
DEVELOPLMENT

HILLVIEW
LOUTH PARK

Project No.	Dwg No.	Rev.
21360L	L104	3
Current as of:		
3 MARCH 2022		

N

LEGEND

STAGE 1

COX LAND

LOUTH PARK ROAD

5
DP 702764

61
DP 825042

62
DP 825042

63
DP 825042

412
DP 854995

EXTENSION OF 15m WIDE
DRAINAGE EASEMENT

EXISTING EASEMENT TO
DRAIN WATER 15m WIDE

CREEK LINE

3m WIDE TEMPORARY
EASEMENT FOR DRAINAGE

3m WIDE TEMPORARY EASEMENT
FOR DRAINAGE LOCATED IN
EXISTING SHARED ACCESS PATH

7.64Ha
STAGE 1

COX
LAND

PROPOSED
DEVELOPLMENT

ROAD 1

ROAD 2

ROAD 3

ROAD 4

ROAD 5

ROAD 8

HILLVIEW
LOUTH PARK

Project No.	Dwg No.	Rev.
21360L	L105	3
Current as of:		
3 MARCH 2022		

JOB No:	18/93	REVISION:	D
FILE ID:	210188	DATUM:	AHD
DESIGNED:	DE	CONTOUR INT:	1m
DRAWN:	DE	SURVEYED:	

Plot Date: Tue Oct 27 13:11:50 2020 Project: X:\18_093_DATASETS\LAYOUT

BARKER STEWART
SURVEYORS
SYDNEY
P: 02 9659 0605
CENTRAL COAST
P: 02 4325 5355
HUNTER
P: 02 4964 8388
ABN: 26 134 067 842
www.bvs.com.au
mail@bvs.com.au

PLAN:
PROPOSED SUBDIVISION
LOT 412 DP 854995
526 LOUTH PARK ROAD
LOUTH PARK

CLIENT:
TULIP PROPERTIES PTY LTD

526 LOUTH PARK ROAD
LOUTH PARK

Horizontal Scale 1:1000 (A1)
1:2000 (A3)

TOTAL SHEETS
2

SHEET No.
2

Appendix 2 Bushfire Models

NBC Bushfire Attack Assessment Report V4.1

AS3959 (2018) Appendix B - Detailed Method 2

Print Date: 1/06/2022 **Assessment Date:** 29/05/2022

Site Street Address: 442 Louth Park Road (NewPro25), Louth Park

Assessor: Dan Pedersen: Cool Burn PL

Local Government Area: Maitland **Alpine Area:** No

Equations Used

Transmissivity: Fuss and Hammins, 2002
Flame Length: RFS PBP, 2001/Vesta/Catchpole
Rate of Fire Spread: Noble et al., 1980
Radiant Heat: Drysdale, 1985; Sullivan et al., 2003; Tan et al., 2005
Peak Elevation of Receiver: Tan et al., 2005
Peak Flame Angle: Tan et al., 2005
Short Fire Run - Methodology for Assessing Bush Fire Risk for Low Risk Vegetation May 2019; NSW RFS

Run Description: Cox Land north

Vegetation Information

Vegetation Type: Hunter Macleay DSF

Vegetation Group: Dry Sclerophyll Forests (Shrub/Grass)

Vegetation Slope: 1.15 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):** 17

Fire Inputs

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

Calculation Parameters

Flame Emissivity: 95 **Relative Humidity(%):** 25

Heat of Combustion(kJ/kg) 18600 **Ambient Temp(K):** 308

Moisture Factor: 5 **FDI:** 100

Program Outputs

Level of Construction: BAL 29 **Peak Elevation of Receiver(m):** 6.59

Radiant Heat(kW/m2): 29 **Flame Angle (degrees):** 63

Flame Length(m): 14.78 **Maximum View Factor:** 0.447

Rate Of Spread (km/h): 1.82 **Inner Protection Area(m):** 13

Transmissivity: 0.853 **Outer Protection Area(m):** 3

Fire Intensity(kW/m): 23116

Short Fire Run Calculations

Fire Run(m): 0 **Length to Breadth Ratio:** 0

Full Ellipse Length(m): 0 **Headfire Backfire Ratio:** 0

Travel Duration (mins): 0 **Total Ellipse Length(m):** 0

ROS and H/B Ratio: 0

BAL Thresholds

	BAL-40:	BAL-29:	BAL-19:	BAL-12.5:	10 kw/m2:	Elevation of Receiver:
Asset Protection Zone(m):	13	17	24	34	53	6

Run Description: SFR Remnant forest on rural living (East)

Vegetation Information

Vegetation Type: Hunter Macleay DSF

Vegetation Group: Dry Sclerophyll Forests (Shrub/Grass)

Vegetation Slope: 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: 2 Degrees **Site Slope Type:** Upslope

Elevation of Receiver(m): Default **APZ/Separation(m):** 12

Fire Inputs

Veg./Flame Width(m): 54.91 **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):** 4.99

Radiant Heat(kW/m2): 28.59 **Flame Angle (degrees):** 61

Flame Length(m): 10.45 **Maximum View Factor:** 0.434

Rate Of Spread (km/h): 2.72 **Inner Protection Area(m):** 12

Transmissivity: 0.866 **Outer Protection Area(m):** 0

Fire Intensity(kW/m): 34611

Short Fire Run Calculations

Fire Run(m): 150 **Length to Breadth Ratio:** 0

Full Ellipse Length(m): 0 **Headfire Backfire Ratio:** 0

Travel Duration (mins): 0 **Total Ellipse Length(m):** 0

ROS and H/B Ratio: 0

BAL Thresholds

	BAL-40:	BAL-29:	BAL-19:	BAL-12.5:	10 kw/m2:	Elevation of Receiver:
Asset Protection Zone(m):	9	12	17	24	36	6