



BUSH FIRE ASSESSMENT REPORT

PLANNING PROPOSAL

Lots 23 & 25 DP 757246

456 – 474 Plumptre Road
Rowan

Rezoning of land for future Residential Subdivision

Prepared for Sunnyside Ventures Pty Ltd

15.11.23

First Issue



EXECUTIVE SUMMARY

EMBER Bushfire Consulting has been engaged by Sunnyside Ventures Pty Ltd, care of GroupOne, to prepare a Bushfire Strategic Study (BFSS) in support of a planning proposal to rezone two parcels of land at 456 - 474 Plumpton Road, Rowan NSW.

The land associated with the rezoning is located on bushfire-prone land, as designated by the Wagga Wagga City Council (WWCC) and NSW RFS.

This assessment requires the application of Section 9.1 (2) of the Environmental Planning and Assessment Act 1979 (EP&A Act). Under Direction 4.4 of the EP&A Act, *Planning for Bush Fire Protection 2019* (PBP 2019) applies to planning proposals on designated Bush Fire Prone Land (BFPL) and is, therefore, the key reference document for this assessment.

The planning proposal seeks the Rezoning of land from RU1 to R1 General Residential and RE1 Public Recreation and apply Urban Release Area provisions at Lots 23 and 25 DP757246, 456 - 474, Plumpton Road, Rowan. If successful, the proposal will significantly expand the proposed residential area to the south of the existing residential development. In anticipation, a concept subdivision plan is proposed and is the centre of this bushfire assessment (Figure 3).

The report establishes the bushfire threat to the Study Area. It examines a range of principles for the proposal to be regarded as suitable for

development and that any future development can satisfy the broad aims and objectives of PBP 2019.

The Strategic Planning Principles include:

- ensuring land is suitable for development in the context of bushfire risk;
- ensuring new development on BFPL will comply with PBP;
- minimising reliance on performance-based solutions;
- providing adequate infrastructure associated with emergency evacuation and firefighting operations, and
- facilitating appropriate ongoing land management practices.

The recommendations contained in this report are designed to inform the planning proposal stage only, not for DA purposes.

The rezoning of the land located within the Study Area is seen as being consistent with the principles of Strategic Planning under PBP 2019.

Due to the dominant grassland setting with isolated areas of remnant woodland vegetation on predominantly flat to slightly undulating topography, the surrounding environment poses a relatively low to moderate bushfire threat to the Study area. This threat, however, can be moderated even further with the adoption of the standard suite of protection measures offered by PBP 2019, with which the proposed development can essentially comply.

The Asset Protection Zones and setback dimensions that will be proposed will ensure the proposed lots provide adequate separation from areas of hazardous vegetation and are not exposed to excessive radiant heat levels.

Access to the Study Area and future concept subdivision will be well provided with multiple access points to Plumpton Road and will essentially comply with the acceptable solutions set out in PBP 2019.

Specific Firefighting water supplies are recommended to meet the specific requirements of PBP 2019.

Based on the bushfire assessment and the recommendations in this BFSS, the planning proposal is deemed capable of meeting the underlying principles of strategic planning and should be supported.

CERTIFICATION STATEMENT

Document Title:	Bushfire Assessment Report Planning Proposal, Rowan
EMBER Reference:	Rowan JD2.38.24
Lot & DP Number	Lots 23 & 25 DP 757246
Street Address	456 – 474 Plumpton Road, Rowan
Local Government Area	Wagga Wagga City Council
Description of the development	Planning proposal
Type of assessment under Planning for Bushfire Protection (2019)	Section 4 – Bush Fire Strategic Study
Is referral of the proposal to the NSW RFS required?	Yes – Direction 4.4 of the EP&A Act (1979)
Has a pre-DA lodgment or bushfire design brief been provided to the NSW RFS?	No
Highest radiant heat flux determined for indicative development.	<29kW/m ²
Highest level of construction applicable:	Bushfire Attack Level (BAL) -29
Accreditation Scheme / Level of accreditation	Bushfire Planning and Design (BPAD) Accreditation Scheme administered by the Fire Protection Association Australia (FPAA)
Prepared by:	Peter Hague (EMBER Bushfire Consulting)
Verified by:	Jeff Dau – BPAD 33128 - Level 3

The author (Jeffrey Dau) hereby certifies that:

- A thorough, in-person survey of the study area by Peter Hague from EMBER Bushfire Consulting was carried out on 29 September 2023;
- A subsequent bushfire threat assessment was undertaken of the site and the proposal per the relevant sections of the NSW Rural Fire Service (NSW RFS) document Planning for Bushfire Protection 2019 (PBP 2019);
- A detailed bush fire assessment report is attached per the submission requirements of Section 4 of PBP 2019, together with recommendations needed for future development to satisfy the specifications and requirements of PBP 2019;
- I am a person recognised by NSW RFS as a qualified consultant in bush fire risk assessment and
- Subject to the recommendations contained in this report, the proposed development conforms to the relevant specifications and requirements of PBP 2019.

Furthermore, I am aware that this report is to be submitted in support of a development application for this site and will be relied upon by the Council to ensure that the bushfire risk management aspects of the proposal have been addressed per PBP.



15/11/2023



DOCUMENT CONTROL

Information	Detail
Document Title:	Bushfire Assessment Report Planning Proposal, Rowan
EMBER Reference:	Rowan JD2.38.24
Other Reference:	Job Reference: SIVA Projects
Version:	1.0
Version Control:	1.0 – First Issue – 15.11.23
Status:	Issued

KEY DETAILS OF DEVELOPMENT

Information	Detail
Zoning of subject land	RU1 – Primary Production
Zoning of adjoining lands	RU1 – Primary Production R5 – Large Lot Residential
Lot size	Lot 23 – 76 Ha / Lot 25 – 35 Ha
Staging issues	Nil
Development classification	Planning Proposal
Type of assessment	Bush Fire Strategic Study (BFSS)
Fire weather area	Eastern Riverina
Fire Danger Index	80
Predominant vegetation	Grassland and Grassy Woodlands Vegetation
Slope	Ranging from flat to 2° downslope
Environmental constraints	Typical Biodiversity Offset Scheme (BOS)
Cultural constraints	Nil known
Method of meeting performance requirements	Using acceptable solutions and performance-based designs.

HOW TO READ THIS DOCUMENT

Section 1 – Introduction and overview of the subject site and proposed development.

Section 2 – Identification of key factors contributing to bushfire threat, including planning considerations and assessment of overall risk.

Section 3 – Discussion of strategic bushfire considerations.

Section 4 – Assessment of the recommended and required bushfire protection measures necessary for life safety and compliance purposes.

Section 5 – Summary of recommendations.

Section 6 – Conclusion

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1 INTRODUCTION AND OVERVIEW

1.1 BACKGROUND

EMBER Bushfire Consulting has been engaged by Sunnyside Ventures Pty Ltd, care of GroupOne, to prepare a Bushfire Strategic Study (BFSS) in support of a planning proposal to rezone two parcels of land for future subdivision at Lots 23 & 25 DP 757246 - 456 & 474, Plumpton Road, Rowan NSW.

The planning proposal is located on land designated bushfire-prone by the Council and the NSW Rural Fire Service (NSW RFS) and, as a result, requires the application of Section 9.1(2) of the Environmental Planning and Assessment Act (1979) (EP&A Act). Under Direction 4.4 of the EP&A Act, Planning for Bush Fire Protection applies to planning proposals on designated Bush Fire Prone Land (BFPL).

Under Direction 4.4, planning proposals should adhere to the following objectives:

- to protect life, property, and the environment from bushfire hazards by discouraging the establishment of incompatible land uses in bushfire-prone areas and
- to encourage sound management of bushfire-prone areas.

The principles for assessment of the planning proposal are provided in Section 4, Strategic Planning, Planning for Bush Fire Protection (2019) (PBP 2019) and is, therefore, the key reference for this report.

The broad principles of Section 4 are to:

- ensure land is suitable for development in the context of bushfire risk;
- ensure new development on BFPL will comply with PBP;
- minimise reliance on performance-based solutions;
- provide adequate infrastructure associated with emergency evacuation and firefighting operations, and
- facilitate appropriate ongoing land management practices.

Accordingly, this BFSS addresses the issues identified in Table 4.2.1 Bush Fire Strategic Study of PBP 2019.

Should the planning proposal be successful, future land development will be required to satisfy the aims and objectives of PBP 2019, therefore, this is also addressed in this report.

This assessment has been prepared through a desktop study of the study area and an in-person area survey completed on 29.9.23 by Peter Hague from EMBER Bushfire Consulting and peer-reviewed by Level 3 Accredited Bushfire Practitioner Jeff Dau.

1.2 AIM AND OBJECTIVES

The aim of this report is to:

- Evaluate the potential bushfire threat to the Study Area.
- Assess the capacity of the proposed concept subdivision development to adequately support the subdivision of land and the erection of dwellings while providing:
 - the minimum bushfire protection necessary to offer life safety to the occupants;
 - improve property protection and facilitate fire service intervention during a bushfire event, and
 - due regard to development potential, site characteristics and protection of the environment.
- Provide initial principles for how any future subdivision and development of land may satisfy the relevant performance criteria for rural residential subdivisions provided in Section 5 of PBP 2019.

1.3 LIMITATIONS AND DISCLAIMER

This report is primarily concerned with assessing the proposal's capacity to withstand the impacts of a bushfire, including ember attack, radiant heat exposure and flame contact.

Where necessary, protection measures will be recommended to provide protection to the occupants, firefighters, and the structures themselves.

It should be kept in mind that the measures recommended cannot guarantee the proposed development will survive a bushfire event on every occasion.

This is primarily due to the dependence on ongoing vegetation management, the unpredictable behaviour of fire, and extreme weather conditions.

EMBER Bushfire Consulting has prepared this report with all reasonable diligence. The information in this report has been gathered from field investigations of the site and plans provided by and discussions with GroupOne, representatives of the property owners.

Table 1 - Stakeholders

Stakeholder	Role	Contact	Detail
Sunnyside Ventures Pty Ltd	Property Owners	Not Given	Not Given
GroupOne	Project Managers	Yaaman Majeed	02 6241 1955
Wagga Wagga City Council	Consent Authority	Not Given	02 6926 9100
NSW Rural Fire Service	Referral Authority	Not Given	02 4475 1300

1.4 STUDY AREA LOCATION



Figure 1 – Regional context of the study area (FPAA FireMaps, 2023)

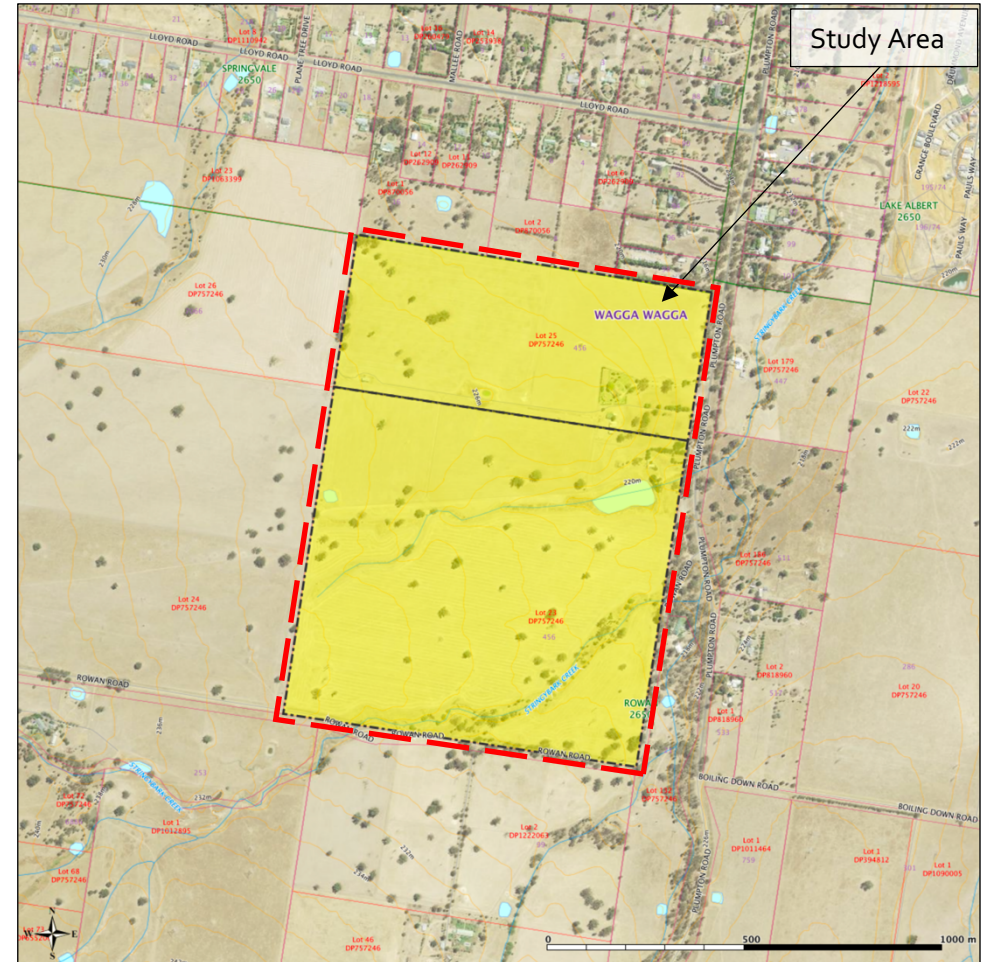


Figure 2 – Local context of the study area (FPAA FireMaps, 2023)

1.5 STUDY AREA DESCRIPTION

Location:

The Study Area comprises two (2) adjoining primary production lots in Rowan, a suburb in Wagga Wagga City in the Riverina Region of New South Wales. It lies approximately 8 km south of the Wagga Wagga city centre, 37 km west of Tarcutta and 59 km north of Holbrook (Figures 1 & 2).

Administration:

The combined ~111 Ha rural lots (Lot 23 – 76 Ha & Lot 25 - 35 Ha) fall under the Wagga Wagga City Council (WWCC) administration.

Land use:

Land use in the area has been restrained to mainly primary production, including livestock grazing and cropping to the east, south and west of the study area, with limited urban and large lot rural residential development without agriculture to the north. Extensive clearing of native vegetation has occurred across the region to allow for cattle grazing and horse agistments and to provide significant areas for cropping.

Accordingly, the Study Area and land to the east, south and west are zoned RU1 – Primary Production, with land to the north zoned as R5 – Large Lot Residential.

Topography:

The Study Area is situated on topography that is considered open and predominantly flat with landform sloping gently from the southwest to the northeast across the Study Area in the order of 0° – 2° downslope generally around a slightly elevated, wide but shallow ephemeral tributary that runs from west to east through the centre of the property feeding a large dam located adjacent to the eastern property boundary of Lot 23 within the study area (Figure 9).

Land continues to gently slope in all directions around the landscape containing ephemeral drainage lines as tributaries of Stringybark Creek, which flows from east to west through the south-eastern corner of the study area.

The topography on neighbouring lots surrounding the Study Area continues to be flat to gently undulating, presenting similar features and terrain.

With the near-flat topography, most of the study area is currently used for cattle grazing and cropping.

Vegetation:

The Study Area presents predominantly as open cleared land (grassland) typically associated with open grazing country and areas cleared for cropping but contains isolated scattered remnant old-growth trees

throughout with the most common tree species including grey box (*Eucalyptus macrocarpa*), yellow box (*E. melliodora*), white box (*E. albens*), red Marshalls (*E. macrorhyncha*), white cypress pine (*Callitris columellaris*) and river red gum (*E. camaldulensis*).

An area of Blakely's Red Gum – Yellow Box Grassy Tall Woodland of the NSW South Western Slopes Bioregion (Vegetation formation Grassy Woodlands - PCT ID: 277) of varying density can be found growing along the banks of Stringybark Creek at the south-eastern corner of Lot 23 and along part of the southern boundary and Rowan Road. This area is connected to a larger section of greater density present along the length of the eastern property boundary of the Study Area and on either side of Plumpton Road, continuing further to the north and south of the Study Area (Figure 7).

The existing dwelling, sheds and outbuildings on Lot 25 of the Study Area are surrounded by established, well-maintained stands of mixed woody vegetation of various species and densities.

Vegetation formations have been cross-checked against the newly available NSW State Vegetation Type Map (Figure 7) and are discussed further in Section 2.

Access:

The study area has direct access to Plumpton Road, which forms the eastern boundary of the study area for approximately 480 metres and Rowan Road, which forms the southern boundary of the study area (Lot 23) for the entire length of the boundary. Plumpton Road runs south from its intersection with Lake Albert Road and provides access for local traffic from nearby residential areas as well as rural areas further south of the study area.

Plumpton Road is a sealed public through road ~8 m wide classified as a sub-arterial road and is under the management of the Wagga Wagga City Council. It provides access to Wagga Wagga when heading north, exiting the study area and intersects with Rowan Road and Boiling Down Road when heading south.

Rowan Road is a well-maintained gravel public through road ~8 m wide that forms the southern boundary of the study area and intersects with Holbrook Road when heading west from Plumpton Road.

The proposed concept subdivision will be designed to provide two (2) points of access/egress to/from the public road network, Plumpton Road, via a complying loop road that traverses through the subdivision, providing access to other internal roads. Further development to the west will increase the public road network and number of access points to the proposed subdivision.

1.6 THE PLANNING PROPOSAL

The planning proposal seeks the Rezoning of land from RU1 to R1 General Residential and RE1 Public Recreation and apply Urban Release Area provisions at Lots 23 and 25 DP757246 - 456 & 474, Plumpton Road, Rowan, in preparation for a future residential subdivision.

The two (2) primary production properties comprise of Lot 23 – 76 Ha and Lot 25 – 35 Ha with a combined total area of ~111 Ha.

In anticipation of a successful planning proposal, a concept subdivision plan has been developed (Figure 3) and is the basis for the compliance assessment to determine the suitability of the planning proposal.

The proposed subdivision is likely to include the following infrastructure:

- Intersection and road upgrades as required.
- Internal public sealed road network.
- Active open space area.
- Passive open space area and
- Landscape plantings as designed to soften and break up expansive views of infrastructure.

The subdivision of land (if successful) will lead to a significant increase in the current population and traffic flow to/from the subdivision.

The construction phase and commencement timing is unknown and is dependant on further detailed design and the appropriate assessment processes.

The planning and design of this subdivision embraces all the acceptable solutions contained within Section 5 Residential Subdivisions PBP2019.

1.7 STUDY AREA AND CONCEPT SUBDIVISION LAYOUT

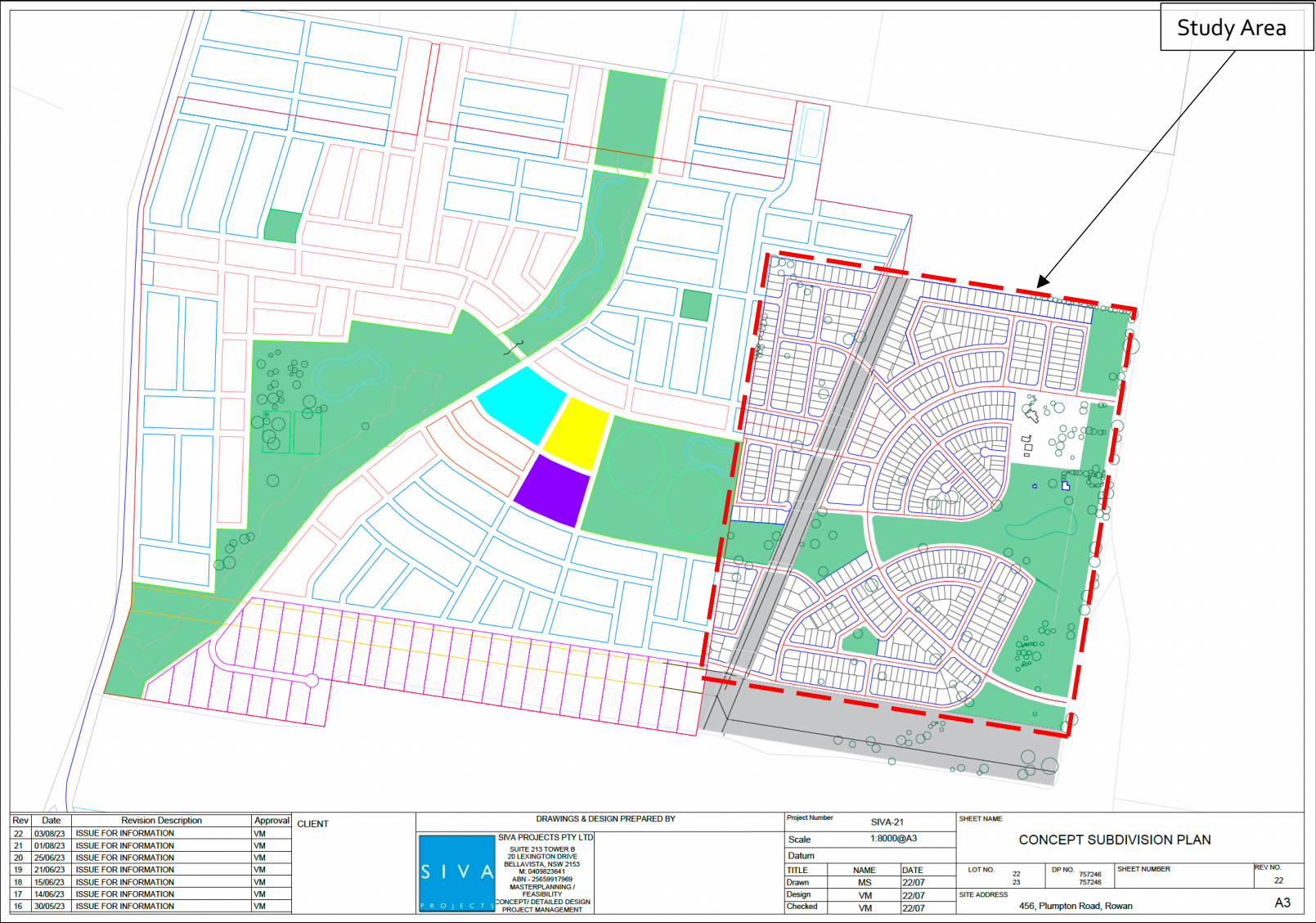


Figure 3 –Proposed concept subdivision plan for 456 – 474 Plumpton Road, Rowan (SIVA Projects, 2023)

2 BUSHFIRE THREAT ASSESSMENT

2.1 METHODOLOGY

The methodology adopted by this report is as follows:

Table 2 - Report Methodology

Method	Task	Considerations
Desktop analysis	Review available mapping resources, policy documents & development plans	Online Maps Development Control Plans Local Environmental Plan
Site inspection	Evaluate the context of the site, determine bushfire threat, options for asset protection zones, access roads and infrastructure.	Ground truth online mapping data, validate vegetation class, obtain site measurements, assess existing structures and infrastructure.
Assessment of proposal against the requirements of the SEARs, Scoping document and PBP 2019.	Assess the development proposal against the objectives of PBP 2019.	Does the proposal comply with the performance criteria provided under PBP 2019?
Report	Preparation and publication of bushfire assessment report	Assess bushfire threat and detail the required and recommended protection measures expected of the proposal.

2.2 DESIGN FIRE ATTRIBUTES

The following environmental factors are adopted across the site to determine the potential bushfire threat posed to the subject site.

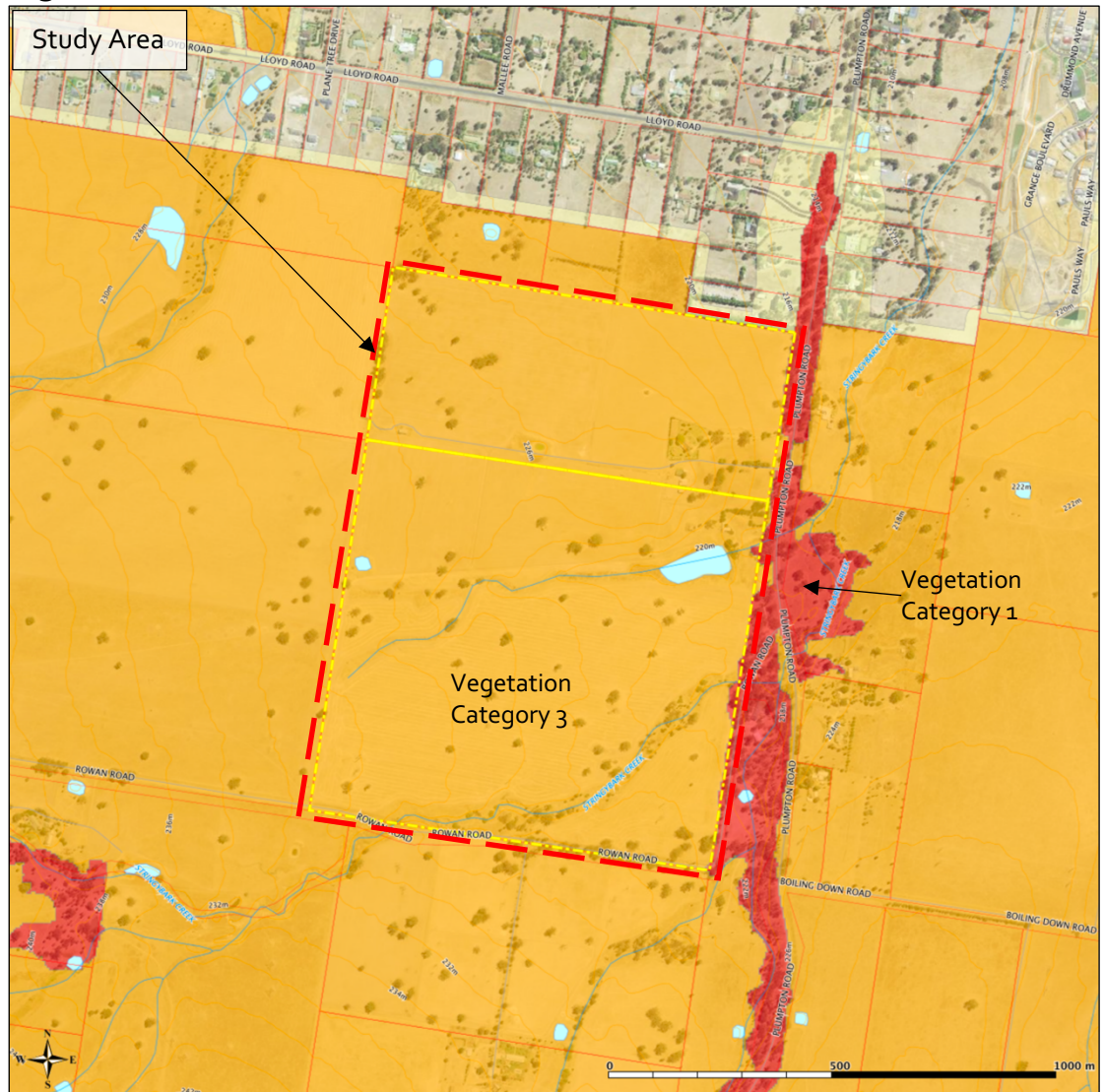
Table 3 - Design fire attributes

Factor	Value
Fire Weather Area	Eastern Riverina
FDI	80
Predominant Vegetation Classification	Grassland and Grassy Woodlands
Slope	Ranging from flat to 2° downslope.

Note: A detailed bushfire hazard analysis is detailed below.

- *Vegetation formations within 140 m of the Study Area are classified in accordance with Plant Community Type (PCT) mapping (Figure 7).*
- *Slopes out to 100 m from planned APZs and/or lot boundaries have been assessed in accordance with A1.4 & A1.5 of PBP 2019.*
- *The site's fire danger index has been determined per the NSW Rural Fire Service.*

2.3 BUSHFIRE PRONE LAND MAPPING



Bushfire prone land mapping relative to the study area (Figure 4) showing the Study Area and adjacent land containing areas of Category 1 and Category 3 Vegetation identified as bush fire prone land by Council and NSW RFS.

During the site survey conducted on the 29th September 2023, these vegetation categories were verified, and the bushfire prone land map found to be an accurate representation of the identified hazard.

A significant amount of Category 1 vegetation along Plumpton Rd will be removed for the construction and upgrading of roads and infrastructure associated with the development proposal.

Hazard classification key:

Hazard	
Bushfire Prone Land	
■	Vegetation Category 1
■	Vegetation Category 2
■	Vegetation Category 3
■	Vegetation Buffer

Figure 4 – Study Area bushfire prone land map. (FPA FireMaps, 2023)

2.4 STUDY AREA FIRE HISTORY

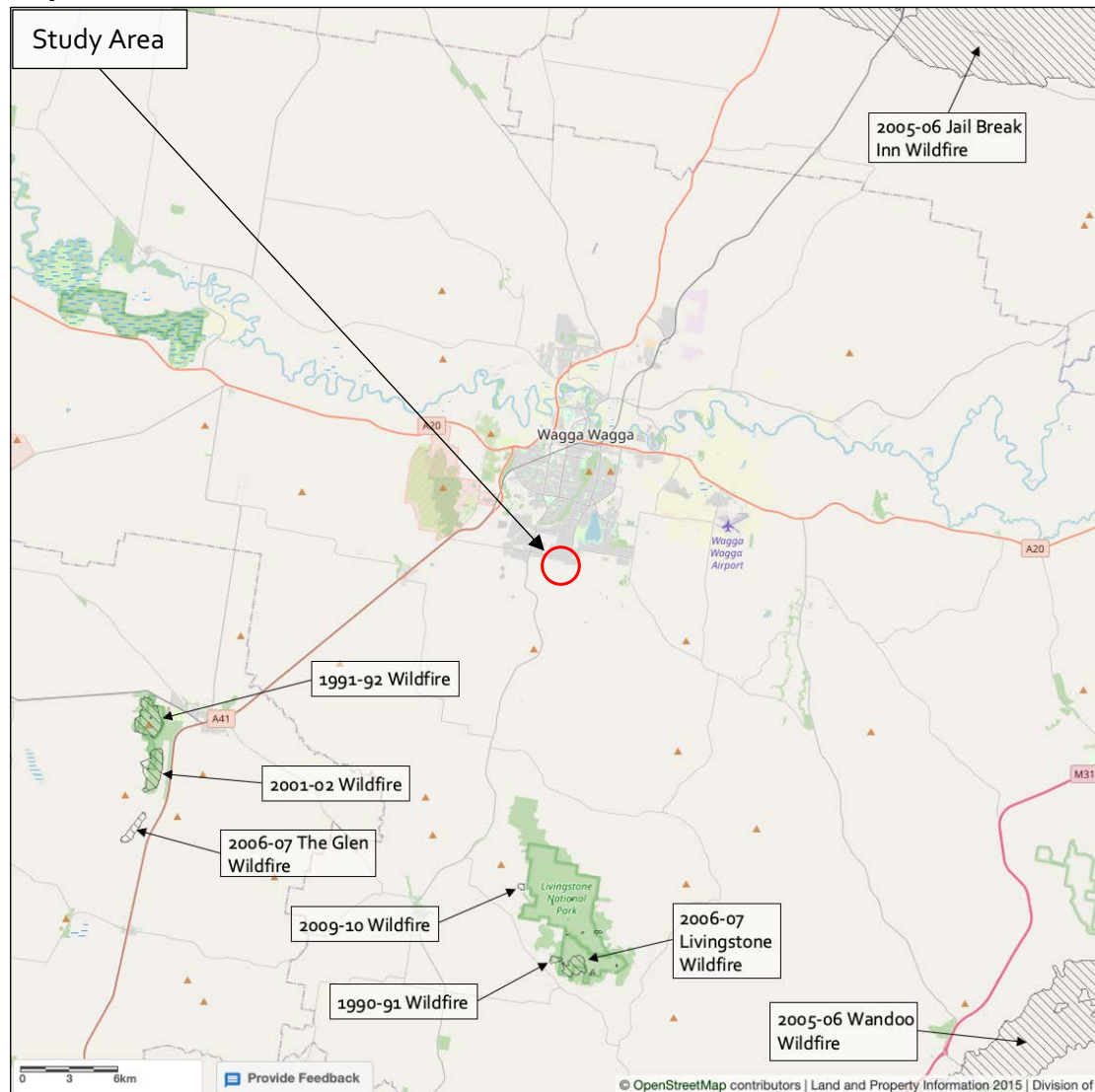


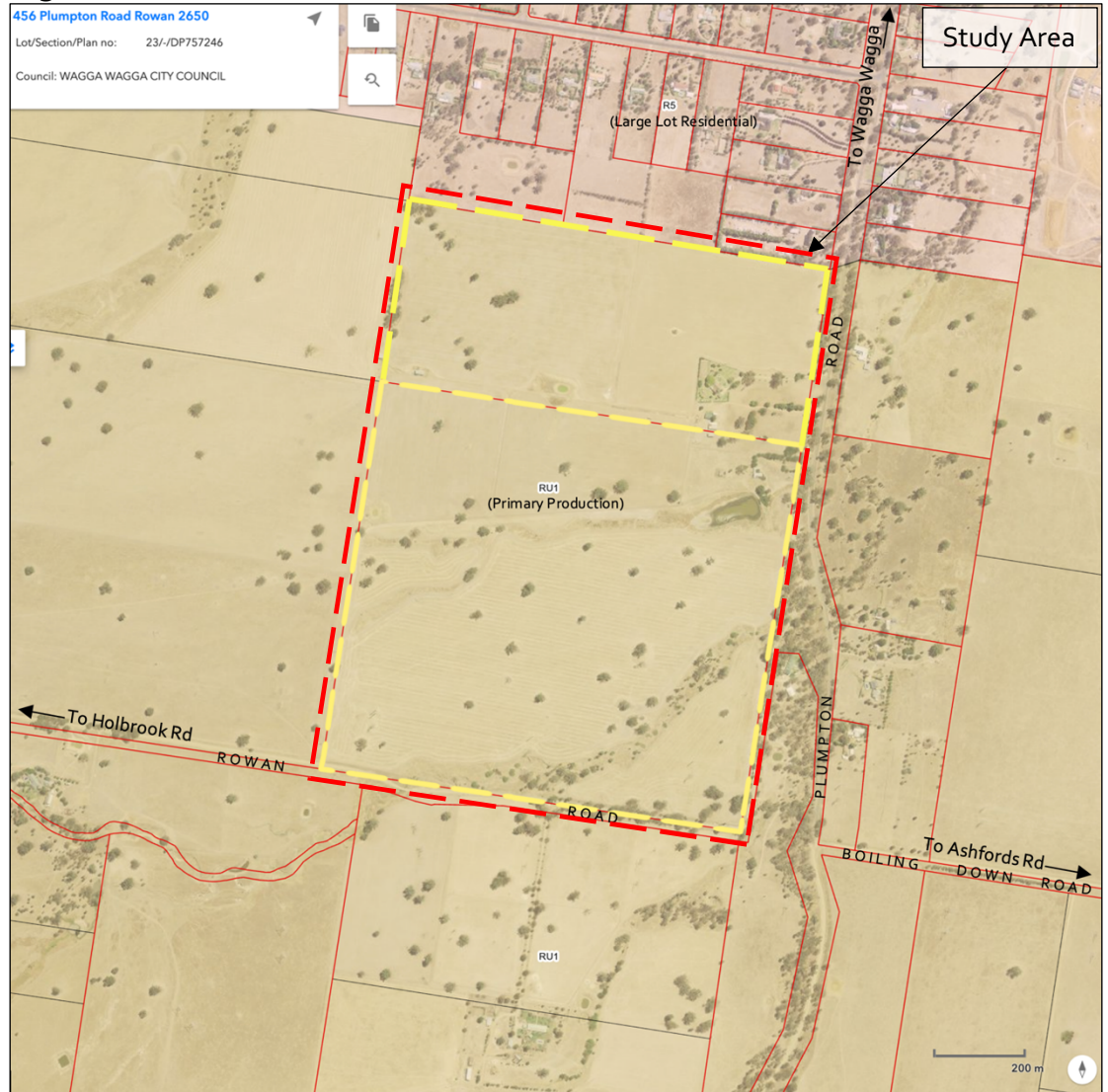
Figure 5 – Map showing fire history surrounding Rowan and approx. extent of the Wildfires. (SEED, 2023)

While the bushfire prone land mapping clearly identifies that any development on the Study Area will require a bush fire assessment and compliance with PBP 2019, fire history provides a clear picture of the true vulnerability of the site.

Figure 5 shows the fire history and extent of bushfires impacting the area surrounding the subject site. The last major bushfire to impact the area was the Livingstone wildfire in 2006-07 which burnt a small area on the southern side of the Livingstone National Park ~20 km south of Rowan. The Study Area was not impacted by these fires.

Although surrounded predominantly by grassland, the greatest threat from bushfire comes from the heavily vegetated areas west of Holbrook Road ~3.5 km southwest of the Study Area, areas surrounding Plum Pudding Hill and throughout Gelston Park as well as Livingstone National Park ~14 km south of the Study Area.

2.5 STUDY AREA ZONING



Subject site zoning as defined by (NSW Government, 2023) NSW Planning Portal – ePlanning Spatial Viewer.

An assessment of land use zoning aids in the evaluation of broadscale landscape practices and the ability to manage vegetation within and surrounding the subject site.

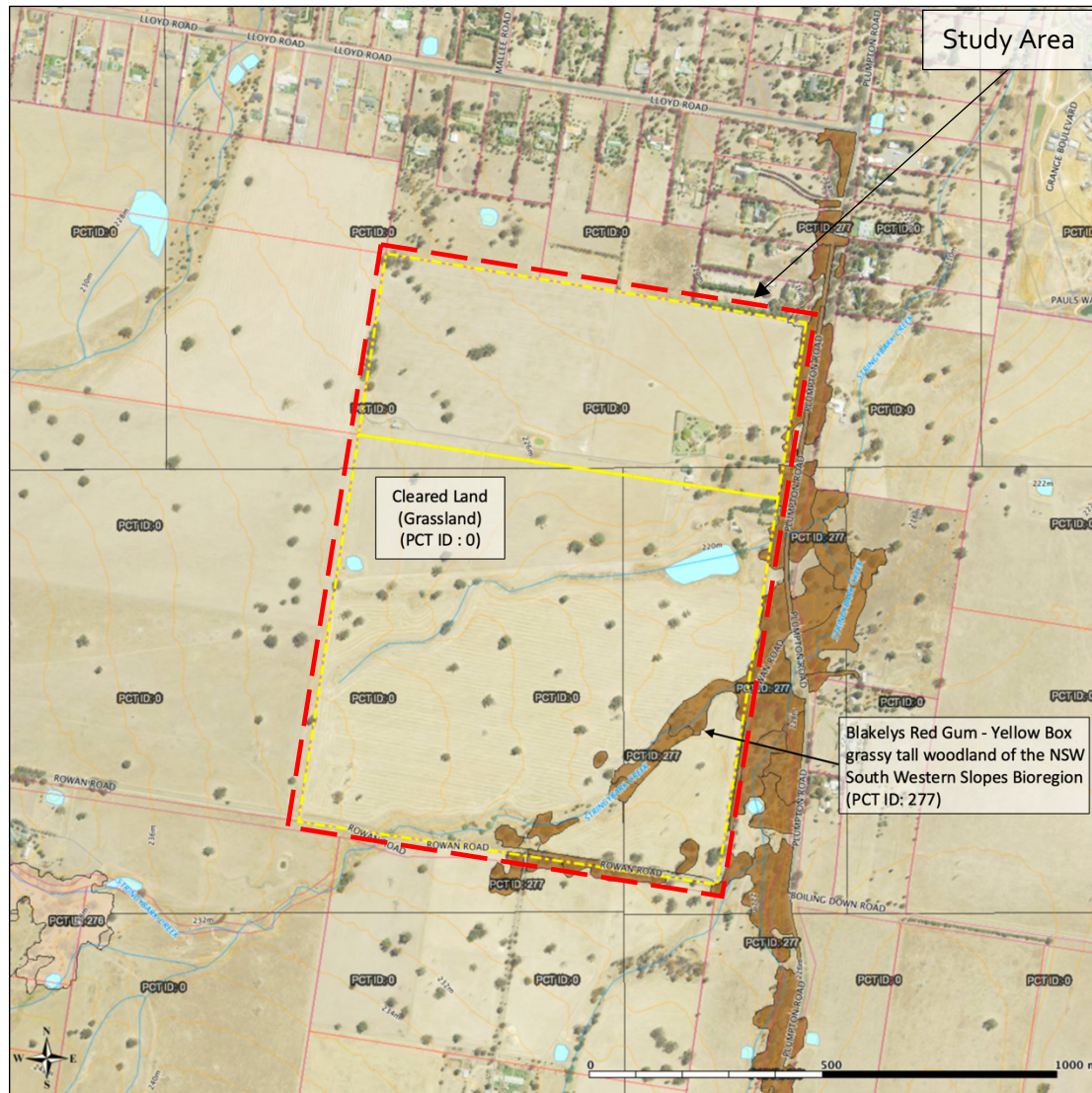
The land zoning map indicates that land to the east, south and west of the Study Area is zoned RU1 – Primary Production.

The adjacent lots to the north of the Study Area are zoned as R5 – Large Lot Residential

RU1 and R5 zoning indicates that land use practices and strategic landscape management allows for intensive management of vegetation (fuels).

Figure 6 – Showing zoning of the study area and adjoining lots. (NSW Planning Portal, 2023)

2.6 STUDY AREA VEGETATION FORMATIONS



Study Area vegetation formations (Figure 7) as defined by SEED (NSW Government, 2023) NSW State Vegetation Type Map.

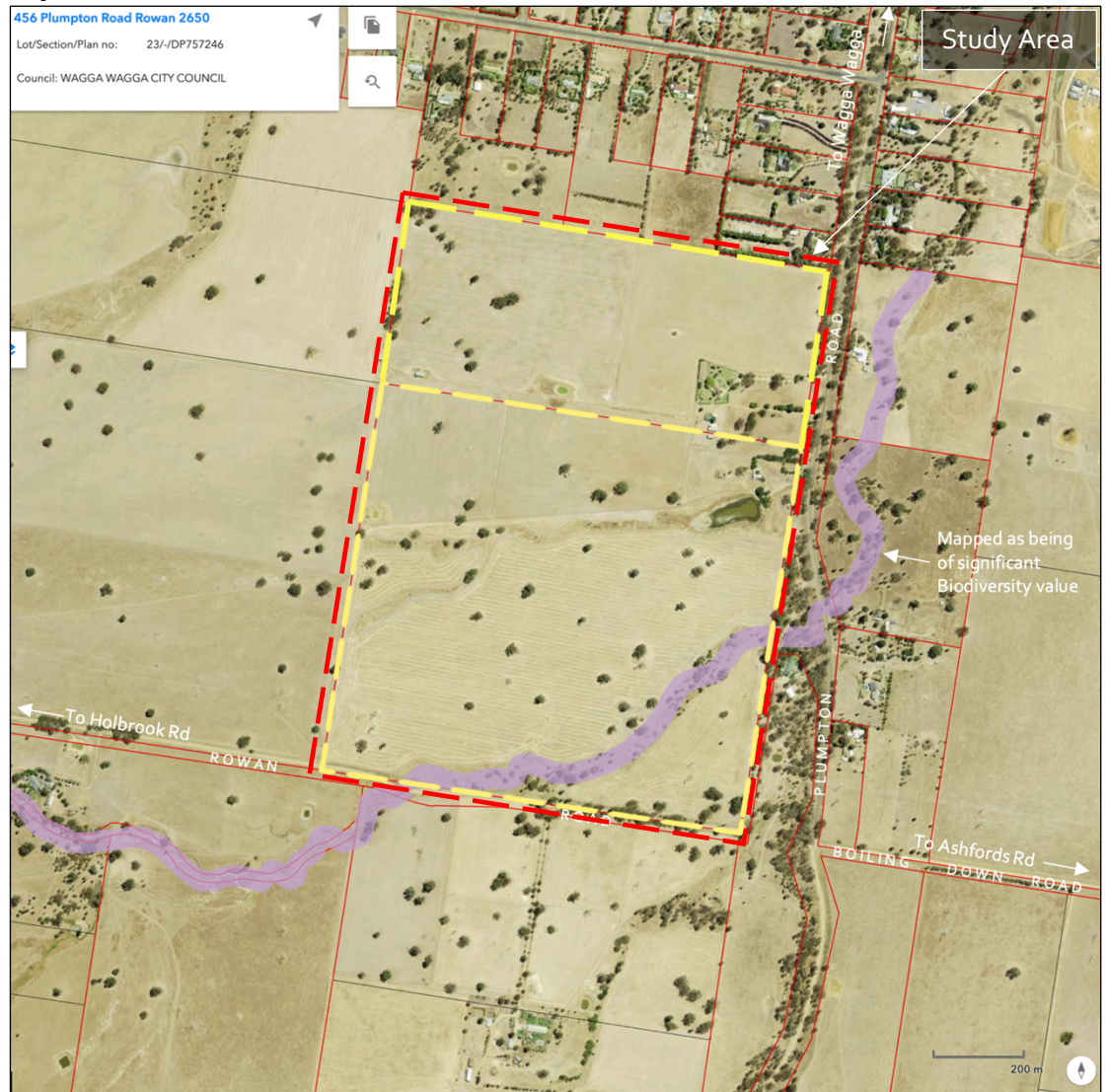
Vegetation mapping indicates that the study area is dominantly influenced by the following vegetation formations –

- Grassland (Cleared land) (low level threat)
- Grassy Woodlands (moderate level threat)

Examples of the existing vegetation formations present within and surrounding the study area are provided below in Photos 1 to 32 and aerial images A1 – A8.

Figure 7 – Vegetation formations adopted for this assessment of the concept subdivision. (SEED, 2023)

2.7 BIODIVERSITY VALUES MAP



The Biodiversity Values Map identifies land with high biodiversity value that is particularly sensitive to impacts from development and clearing.

The map forms part of the Biodiversity Offsets Scheme threshold, which is one of the factors for determining whether the Biodiversity Offset Scheme applies to a clearing or development proposal.

The map is prepared by the Department of Planning and Environment under Part 7 of the Biodiversity Conservation Act 2016 (BC Act).

The proposed development site contains areas identified with high biodiversity value and therefore the clearing or management of land in these areas for the purposes of APZs or property access may not be achievable.

Note, this is for indicative purposes and not intended to be a replacement for a comprehensive ecological assessment.

Figure 7 – Vegetation formations adopted for this assessment of the concept subdivision. (SEED, 2023)

2.8 STUDY AREA PHOTO POINTS

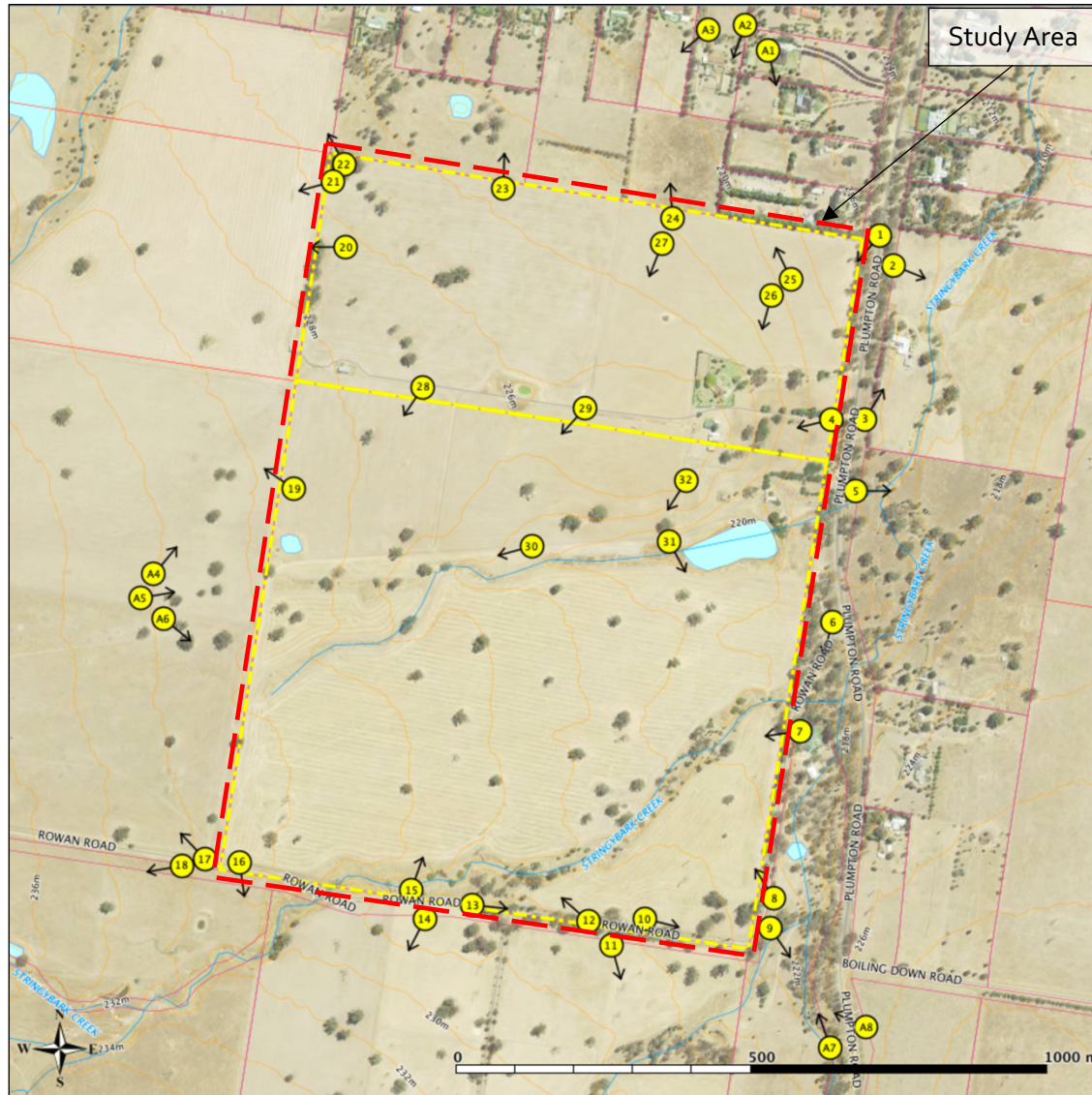


Figure 8 – Photo point locations. (FPA FireMaps, 2023)

2.9 PHOTOGRAPHIC OVERVIEW OF SITE VEGETATION



Photo Point 1. Showing hazard vegetation adjacent to the eastern boundary of the Study Area along Plumpton Road.



Photo point 3. Showing hazard vegetation present along Plumpton Road east of the Study Area.



Photo point 2. Showing hazard vegetation on the adjacent property east of the Study Area and Plumpton Road.



Photo point 4. Showing hazard vegetation east of the existing residence within the study area on Lot 25 - Plumpton Road, Rowan.

PHOTOGRAPHIC OVERVIEW OF SITE VEGETATION



Photo Point 5. Showing hazard vegetation on the adjacent property east of the Study Area and Plumpton Road.



Photo Point 7. Showing hazard vegetation within the study area on Lot 23 – Plumpton Road, Rowan.



Photo point 6. Showing hazard vegetation present along Rowan Road east of the Study Area.



Photo point 8. Showing hazard vegetation and electricity power easement within the study area on Lot 23 – Plumpton Road, Rowan.

PHOTOGRAPHIC OVERVIEW OF SITE VEGETATION



Photo Point 9. Showing hazard vegetation on the adjacent property southeast of the Study Area and Rowan Road.



Photo Point 11. Showing hazard vegetation on the adjacent property south of the Study Area and Rowan Road.



Photo point 10. Showing the general condition of the well-maintained Rowan Road and hazard vegetation south of the Study Area.



Photo point 12. Showing hazard vegetation and electricity power easement within the study area on Lot 23 – Plumpton Road, Rowan.

PHOTOGRAPHIC OVERVIEW OF SITE VEGETATION



Photo Point 13. Showing the general condition of the well-maintained Rowan Road and hazard vegetation south of the Study Area.



Photo Point 15. Showing hazard vegetation, Stringybark Creek and the electricity power easement within the study area on Lot 23 – Plumpton Road, Rowan.



Photo point 14. Showing hazard vegetation on the adjacent property south of the Study Area and Rowan Road.



Photo point 16. Showing hazard vegetation on the adjacent property south of the Study Area and Rowan Road.



Photo Point 19. Showing hazard vegetation on the adjacent property west of the Study Area.

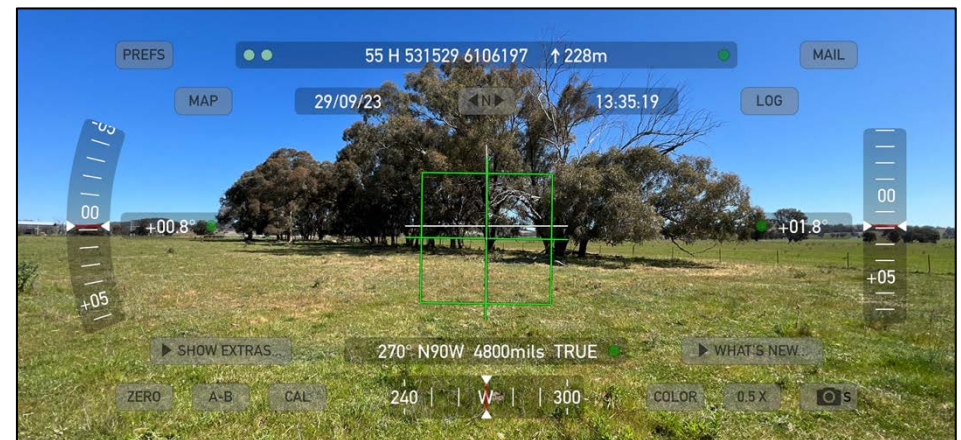


Photo point 20. Showing an example of Grassy Woodlands vegetation formation along the western boundary within the Study Area .

PHOTOGRAPHIC OVERVIEW OF SITE VEGETATION



Photo Point 21. Showing hazard vegetation on the adjacent property west of the Study Area.



Photo Point 23. Showing hazard vegetation on the adjacent property north of the Study Area.



Photo point 22. Showing hazard vegetation on the adjacent property northwest of the Study Area.



Photo point 24. Showing hazard vegetation on the adjacent property north of the Study Area.

PHOTOGRAPHIC OVERVIEW OF SITE VEGETATION



Photo Point 25. Showing hazard vegetation on the adjacent property north of the Study Area.



Photo Point 27. Showing hazard vegetation within the study area northwest of the existing residence on Lot 25 – Plumpton Road, Rowan.



Photo point 26. Showing hazard vegetation within the study area north of the existing residence on Lot 25 – Plumpton Road, Rowan.



Photo point 28. Showing hazard vegetation within the study area southwest of the existing residence on Lot 23 – Plumpton Road, Rowan.

PHOTOGRAPHIC OVERVIEW OF SITE VEGETATION



Photo Point 29. Showing hazard vegetation within the study area southwest of the existing residence on Lot 23 – Plumpton Road, Rowan.



Photo Point 31. Showing the large dam and surrounding hazard vegetation within the Study Area on Lot 23 – Plumpton Road, Rowan.



Photo point 30. Showing hazard vegetation within the study area on Lot 23 – Plumpton Road, Rowan.



Photo point 32. Showing the large dam and surrounding hazard vegetation within the Study Area on Lot 23 – Plumpton Road, Rowan.

2.10 AERIAL OVERVIEW OF THE STUDY AREA



Photo Point A1. Looking south at the eastern section of the Study Area showing adjacent properties and the extent of surrounding hazard vegetation.



Photo Point A3. Looking southwest at the western section of the Study Area showing internal and surrounding hazard vegetation and adjacent properties.



Photo point A2. Looking south at 456 – 475 Plumpton Road, Rowan, the Study Area showing the extent of internal and surrounding hazard vegetation.



Photo point A4. Looking northeast at the northern section of the Study Area showing internal and surrounding hazard vegetation and adjacent properties.

AERIAL OVERVIEW OF THE STUDY AREA



Photo Point A5. Looking east at 456 – 475 Plumptton Road, Rowan, the Study Area showing the extent of internal and surrounding hazard vegetation.



Photo Point A7. Looking northwest at the Study Area and Plumptton Road showing internal and surrounding hazard vegetation and adjacent properties.



Photo point A6. Looking southeast at the southern section of the Study Area showing internal and surrounding hazard vegetation and adjacent properties.

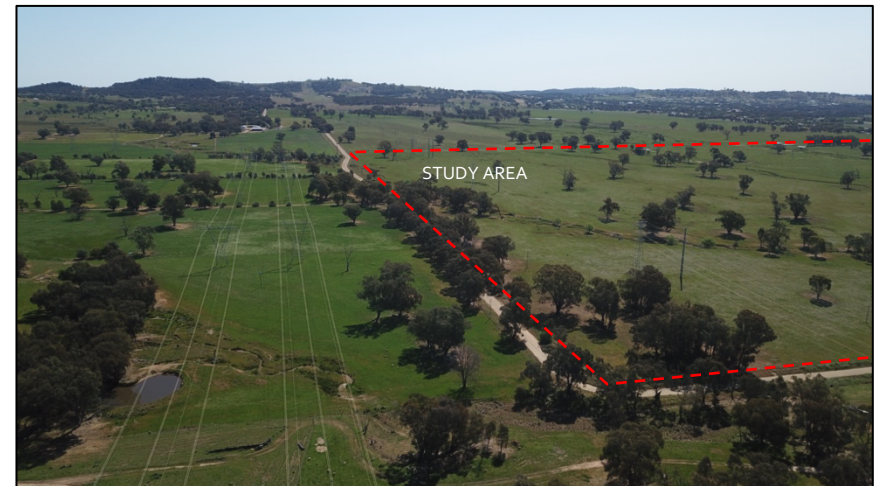
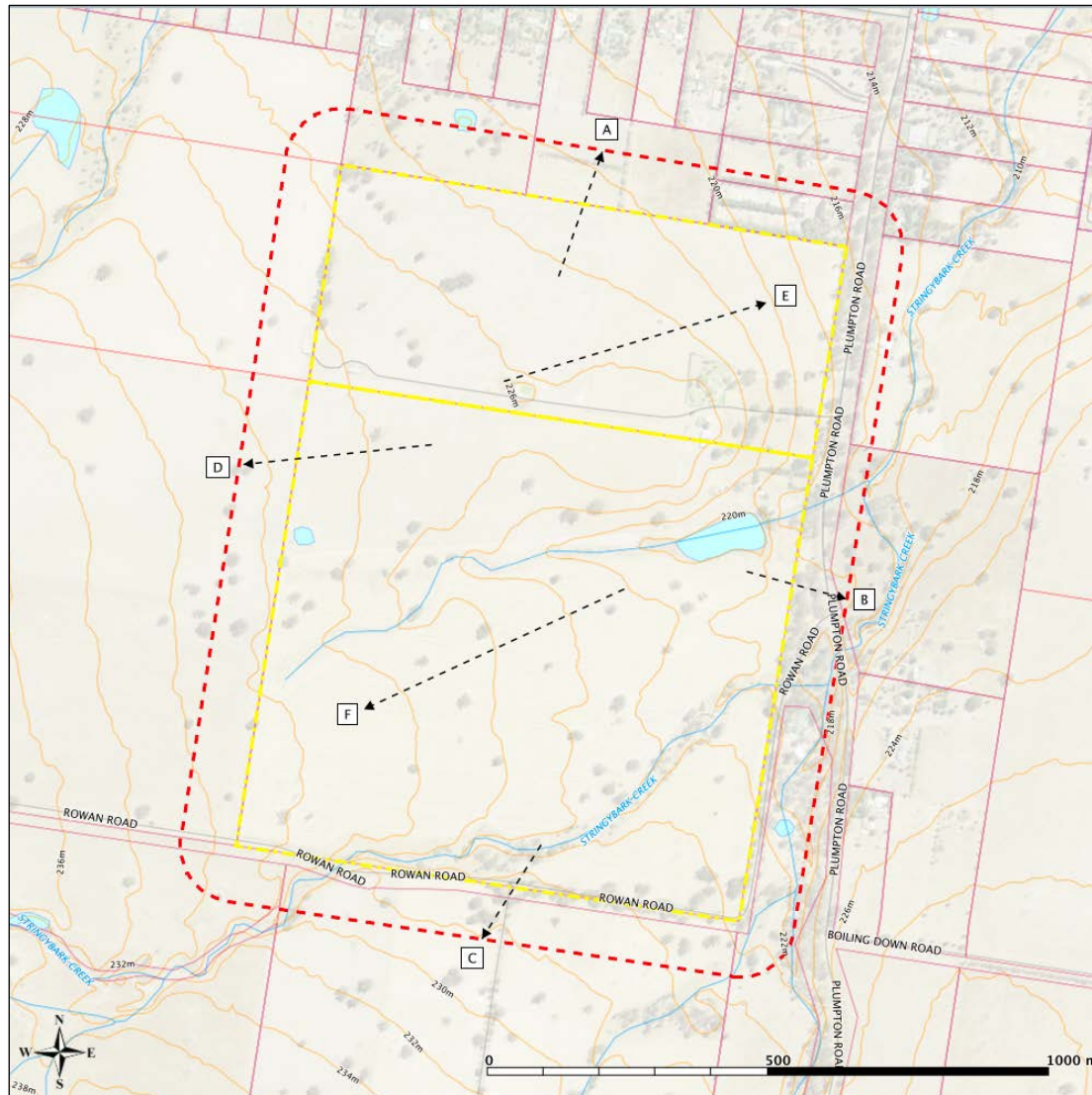


Photo point A8. Looking northwest at the southern section of the Study Area showing surrounding hazard vegetation, adjacent properties and power easement.

2.11 SLOPE ASSESSMENT



TRANSECT | DIRECTION | SLOPE READING

- (A) | North | Avg. o.6° Downslope
- (B) | East | Flat
- (C) | South | Upslope
- (D) | West | Avg. o.6° Downslope
- (E) | Northeast (Internal) | Avg. o.6° Downslope
- (F) | Southwest (Internal) | Upslope

Figure 9 – Broadscale slope assessment of Study Area. (FPA, FireMaps, 2023)

2.12 BAL ANALYSIS



Figure 10 – BAL analysis showing indicative BAL 29 setback line confirming the concept subdivision can broadly comply with A1.12.2 PBP 2019. (FPA FireMaps, 2023)

The BAL rating for the development proposal is to be reassessed during the DA preparation taking into consideration further residential development of land to the west of the Study Area.

The area within the powerline easement along Rowan Road will be maintained as an APZ providing a ~140 m maintained buffer from Rowan Road to the southern perimeter road and lots of the proposed subdivision.

2.13 EMERGENCY SERVICES

The Study Area is adequately serviced by NSW Rural Fire Service and Fire & Rescue NSW.

The closest responding NSW RFS brigades and stations, and resources available for Rowan are:

Lake Albert NSW RFS (500 Mitchell Rd, Gregadoo) (6.1 km / 6 min from the study area)

- 3 x Category 1 Heavy Tankers

Forest Hill Rural Fire Brigade (82 Elizabeth Ave, Forest Hill) (14 km / 12 min from the study area)

- 1 x Category 1 tanker
- 1 x Category 10 pumper

Uranquinty Rural Fire Brigade (Uranquinty) (12 km / 13 min from the study area)

- 1 x Category 1 tanker

Wagga Wagga Fire & Rescue NSW (The Esplanade) (10 km / 14 min from the study area)

- 1 x Category 1 tanker (To be confirmed)
- 1 x Type 2 urban pump (To be confirmed)

Fire & Rescue NSW Stations within 20 min of the study area include Wagga Wagga Fire Station.

3 STRATEGIC BUSHFIRE CONSIDERATIONS

3.1 BUSH FIRE LANDSCAPE ASSESSMENT

Vegetation –

The Study Area does not support a great range of vegetation community types, as shown by the NSW State Vegetation Type Map (Figure 7). This vegetation type map also provides good context to the distribution and extent of vegetation formations across the Study Area.

It is further evident from the site photos and aerial images (photos 1 to 32 & A1 to A8) that the study area is predominantly influenced by cleared land (grassland) to graze livestock and cropping but contains isolated scattered areas of remnant old-growth trees throughout the study area.

The existing dwelling, sheds and outbuildings on Lot 25 of the Study Area are surrounded by established, well-maintained stands of mixed woody vegetation of various species and densities.

Given the size of the neighbouring properties (large lot residential) to the north adjoining the study area, and despite the vast majority being developed with established residential properties and well-maintained grounds, due to lot size and vegetation, a conservative approach has been taken for hazard analysis. The vegetation classifications of grasslands and grassy woodlands in that direction have been adopted for this assessment.

Grassland (including grassland with scattered paddock trees and areas of remnant woody vegetation <1 Ha) is viewed as a relatively low threat, as is remnant vegetation, which shares the same APZ setback dimensions and building construction standard values as rainforest.

Separating the adjoining primary production properties to the east of Plumpton Road and the study area is a large section of Blakely's Red Gum – Yellow Box Grassy Tall Woodland of the NSW South Western Slopes Bioregion (Vegetation formation PCT ID: 277 - Grassy Woodlands) of varying density that runs along the length of the eastern property boundary of the Study Area and on either side of Plumpton Road, continuing further to the north and south of the Study Area. This area of vegetation poses the greatest threat in a bushfire event due to its fuel loads and proximity to the Study Area however, a significant amount of Category 1 vegetation along Plumpton Rd adjoining the Study Area will be removed for the construction and upgrading of roads and infrastructure associated with the development proposal.

The properties to the east have established well-maintained residences, and beyond the woodland vegetation abutting Plumpton Road, are dominantly influenced by large areas of open cleared land (grassland) typically associated with open grazing country and areas cleared for cropping but, also like the Study Area, contains isolated scattered remnant old growth trees of varying density throughout.

Land to the south and west continues to present similar features and terrain to the Study Area. It is predominantly influenced by cleared land (grassland) to graze livestock and cropping with sparsely scattered paddock trees and small isolated areas of remnant old-growth trees throughout.

While acknowledging the potential of these fuel types to carry fire, they are regarded as a low to moderate threat. The proposed subdivision is well away from areas of high-threat vegetation.

Topography –

The topography within the study area is predominantly flat with a gentle north-easterly slope across the Study Area in the order of 0° – 2° downslope, generally following a slightly elevated, wide but shallow ephemeral tributary that runs from west to east through the centre of the property feeding a large dam located adjacent to the eastern property boundary on Lot 23 within the Study Area (Figure 9).

Land continues to gently slope in all directions around the landscape containing ephemeral drainage lines as tributaries of Stringybark Creek, which flows from east to west through the south-eastern corner of the study area.

With the near-flat topography, most of the study area is currently used for cattle grazing and cropping.

With an understanding that steeper slopes increase fire threat potential, the near flat topography of the study area provides a low-threat environment for the proposed future concept residential subdivision development and an excellent opportunity to provide a range of Bushfire Protection Measures (BPMs) that will satisfy the acceptable solutions of PBP 2019.

Weather -

For planning and assessment purposes, the Study Area attracts a Fire Danger Index (FDI) of 80 (Eastern Riverina) as assigned to the Wagga Wagga Fire Weather District by NSW RFS.

With that established, however, as was seen during the Black Summer Fires in 2019-20, any area can experience elevated fire conditions in any given Summer, and these conditions are not unusual in assessing fire potential over the normal.

Fire History -

The study area demonstrates no history of direct fire impacts. However, given the surrounding vegetation and past fire activity near the site, it is not immune to the possibility of a bushfire attack.

While land use, population and the landscape have changed since the time of the last fire in the proximity of the site (2006-07 Livingstone Wildfire), the site is still considered vulnerable, including from a fire event originating from

the more densely vegetated and developed areas directly to the north, the tree-lined Plumpton Road and heavily vegetated areas west of Holbrook Road ~3.5 km southwest of the Study Area and areas surrounding Plum Pudding Hill and throughout Gelston Park.

Given the density and minimal landscape and vegetation management practices on the developed lots to the north and east of the study area, the threat of fire from these directions will be persistent for the life of the development. Further future urban development to the west of the Study Area will see the threat of fire reduced, however, the threat will always remain.

In the proper context and environment, however, PBP 2019 provides the necessary protection measures to mitigate bushfire risk and support development in bushfire-prone environments.

3.2 LAND USE ASSESSMENT

Land use in the area has been restrained to mainly primary production, including livestock grazing and cropping to the east, south and west of the Study Area, with limited urban and large lot rural residential properties without agriculture to the north.

Accordingly, the Study Area is zoned RU1 – Primary Production.

A change in zoning from RU1 and R5 to R1 General Residential and RE1 Public Recreation and applying Urban Release Area provisions, if the concept subdivision is successful, will increase local population and traffic within the area and the upgrading of existing infrastructure. The concept subdivision will also further reduce the amount of unmanaged vegetation on the perimeter of southern Rowan, therefore reducing fuel hazards.

3.3 ACCESS AND EGRESS

As noted in Section 1.5, access to the Study Area and current concept subdivision design is well provided for with direct and close access provided from two (2) locations along Plumpton Road (Public through road network), creating a loop road that traverses through the concept subdivision allowing access to/from other interconnecting internal roads and at a minimum, will comply with the acceptable solutions for access in PBP 2019 while enabling through road access for the subdivision.

Plumpton Road is a sealed public through road ~8 m wide classified as a sub-arterial road and is under the management of the Wagga Wagga City Council. It provides access to Wagga Wagga when heading north, exiting the study area and intersects with Rowan Road and Boiling Down Road when heading south.

The current concept subdivision design will also have numerous internal access roads to Rowan Village to the west of the Study Area, increasing the number of road connections to the wider public road network.

3.4 EMERGENCY SERVICES

As identified, the greatest source of bushfire risk is external to the study area and is likely to remain in perpetuity regardless of further future residential development in the area and given the proximity of more dense vegetation in the already established areas to the north and east being subject to minimal management.

That being the case, the concept subdivision would be well serviced by the local NSW RFS Brigades at Wagga Wagga, Lake Albert and Forest Hill, amongst other resources, including Fire & Rescue NSW.

The proposed subdivision would significantly increase the number of residential structures in the area, invariably increasing demand for structural firefighting capabilities in the event of a fire. It would be assumed that this future demand will result in an increase in local firefighting resources and the upgrading of existing facilities.

3.5 INFRASTRUCTURE

Water Supplies -

The proposed subdivision will be provided with reticulated water supplies from the town's main water supply, including a fire hydrant system provided in accordance with the relevant clauses of AS 2419.1:2005 - Fire hydrant installations System design, installation and commissioning.

Recommendations:

Water Supplies - Water supplies are to be provided in accordance with the specifications set out in Table 7.4a of PBP 2019.

Other Infrastructure -

- Electricity Services – Electricity power supply throughout the proposed concept subdivision will be via a new underground mains electricity service and will be provided in accordance with the specifications set out in Table 7.4a of PBP 2019.
- Gas Services – If provided, it is envisaged that gas supplies to any future residence will be reticulated natural gas supplies. Therefore, supplies and fittings must comply with the specifications set out in Table 7.4a of PBP 2019.

3.6 ADJOINING LAND

The Study Area is in the locality of Rowan, a suburb in Wagga Wagga City in the Riverina Region of New South Wales, approximately 8 km south of the Wagga Wagga city centre. The Study Area is bound by Plumpton Road on its eastern boundary, and Rowan Road forms its southern boundary.

Land to the study area's east, south and west is zoned RU1 – Primary Production. It is predominantly large grassland areas containing isolated sections of remnant old-growth trees throughout. These properties have established residences and farm sheds and are mainly used for primary production purposes, including livestock grazing and cropping and presents similar topography to the Study Area.

Land to the north of the Study Area is zoned R5 – Large Lot Residential, with the majority of the lots being developed and comprising established and well-maintained residences and infrastructure.

3.7 STRATEGIC BUSHFIRE CONSIDERATIONS CONCLUDING STATEMENT.

The Study Area is:

- Designated Bushfire Prone.
- Is currently dominated by grassland fuels with areas of remnant old-growth trees.
- Is considered a low to moderate threat environment.

- Has no recent history of bushfire threat and impact.
- Has open and predominantly flat terrain.
- Has access to roads that comply with PBP 2019 and
- Is near existing infrastructure and amenities.

In general terms, the proposed rezoning of the study area from RU1 to R1 General Residential and RE1 Public Recreation and apply Urban Release Area provisions and subsequent subdivision is supported as consistent with the principles of Strategic Planning under PBP 2019.

The proposed rezoning and concept subdivision plan will essentially comply with the broad aims and objectives of PBP 2019, and there is an excellent opportunity to provide a range of bushfire protection improvements that address the bushfire threat and the compliance requirements of PBP 2019.

Access arrangements for the proposed subdivision will broadly comply with requirements with possible future expansion if successful onto neighbouring properties to the west.

The predominant vegetation types influencing the study area are classified as grassland and grassy woodlands. While these represent an elevated threat, given the large APZs possible, this threat level can be largely moderated.

Although the Study Area demonstrates no recent history of direct fire impacts, it is not immune to the possibility of bushfire attack in the future

given the surrounding vegetation, the past fire activity in proximity of the site and the increasing impacts of climate change.

In the event of a bushfire, the proposed subdivision is well positioned, with emergency services nearby.

4 BUSHFIRE PROTECTION AND PREVENTION MEASURES

With the successful rezoning of the Study Area and although only at the concept subdivision design stage, it is possible to anticipate what Bushfire Protection and Prevention Measures (BPMs) would be required for the residential subdivision to satisfy the broad aims and objectives of PBP 2019 as well as specific considerations detailed in Chapter 5 – Residential and Rural Residential Subdivisions.

The intent of these BPMs is to provide for the protection of human life, including the safety of firefighters and occupants, assist in building survival during a bush fire, minimising the impacts on structures while having due regard to development potential, site characteristics and protection of the environment.

Bush fire protection measures generally serve a dual purpose by protecting the site from external fire threats but also containing fire within the site should it occur, stopping it from escaping onto adjoining lands. Where specific prevention measures are required, these will be detailed separately.

The concept subdivision in its current form appears to be capable of satisfying the performance criteria for residential subdivisions and, therefore, the broad aims and objectives of PBP 2019.

4.1 ASSET PROTECTION ZONES (APZs) & SETBACKS

Discussion - APZs:

APZs and setbacks provide a buffer zone between identified hazards and structures. Setbacks will ensure appropriate separation from hazardous vegetation, while APZs are bands of landscape managed to minimise fuel loads and reduce potential radiant heat levels, flame, localised smoke and ember attack.

APZs are determined by analysing hazard (unmanaged vegetation) and slope (Figure 9) and cross-referenced with minimum setback dimensions provided for residential subdivisions in Table A1.12.3 PBP 2019.

The dominant current hazard lies to the east, south and west of the concept subdivision with large areas of grassland and woodland (the woodland predominantly present along Plumpton Road), which will remain persistent for the life of the development. Further future development to the west of the Study Area, if approved, will reduce the current hazard in that direction. Protection measures commensurate to this hazard will be applied.

Where the residential lots abut unmanaged hazard vegetation, building envelopes for the proposed subdivision will be mandatory and designed to ensure adequate separation for future residences from the hazard vegetation and a defensible space for fire fighters to carry out firefighting operations during a bushfire event.

The APZ and setback dimensions will ensure that any future dwelling is not subject to a radiant heat flux greater than or equal to 29 kW/m² and, therefore, comply with the requirements of Table A1.12.3 PBP 2019.

Before future development, the dwellings on all lots identified will require a BAL assessment to determine the construction level.

APZs are to be established and managed in perpetuity and in accordance with the requirements of Asset Protection Zone Standards - Appendix 4 of PBP 2019.

Recommendations:

- The APZ and setback dimensions are to ensure that any potential building footprint is not exposed to a radiant heat flux level greater than or equal to 29 kW/m² and, therefore, comply with the requirements of Table A1.12.3 PBP 2019.
- APZs are to be established and managed in perpetuity in accordance with the requirements of Asset Protection Zone Standards - Appendix 4 of PBP 2019.

- At the commencement of building works and in perpetuity, all land within the APZ is to be managed as IPA in accordance with the requirements of Asset Protection Zone Standards - Appendix 4 of PBP 2019.
- Future development of the rezoned lots identified as subject to bushfire attack will require a subsequent BAL assessment to determine the construction level in accordance with the relevant sections of Australian Standard AS3959-2018 Amd 2 Construction of buildings in bushfire-prone areas as amended, or NASH Standard (1.7.14 updated) National Standard Steel Framed Construction in Bushfire Areas – 2014 as appropriate.

4.2 LANDSCAPING

Recommendations:

- All landscape within areas identified as APZ within the proposed subdivision will require management in perpetuity as an Inner Protection Area (IPA) in accordance with the requirements of Asset Protection Zone Standards - Appendix 4 of PBP 2019.
- Tree species is to be considered in the DA and detailed design stages to reduce the potential risk of fire from the plants selected for landscaping within the proposed subdivision.

- All roadside landscaping will require management in perpetuity and in accordance with the requirements of Asset Protection Zone Standards - Appendix 4 of PBP 2019.
- A landscape management regime for landscaping within the proposed subdivision including within the electrical power easements is to be prepared in accordance with the requirements of Asset Protection Zone Standards - Appendix 4 of PBP 2019.

4.3 ACCESS

Discussion – Access:

Future access to the concept subdivision will be via two (2) alternative entry points from Plumpton Road (Public through road network), creating a loop road that traverses through the concept subdivision, providing through-road access and connection with other internal roads.

The proposed subdivision has been designed with an interconnecting internal road network, including perimeter roads and multiple connection points with future development to the west, enabling multiple through-road access points for the estate.

In its current layout, the concept subdivision generally can satisfy all acceptable access solutions under PBP 2019. Where the acceptable solutions cannot be met, eg. perimeter roads, a performance-based design will be proposed to address the issue and compliance with PBP 2019.

Recommendations:

- Property access road to be provided and maintained in accordance with the specifications and requirements set out in Table 5.3b of PBP 2019.

4.4 SERVICES – WATER, ELECTRICITY AND GAS:

Discussion – Water supplies:

New residences would be required to provide water supplies and electricity services in accordance with the specifications set out in Table 7.4a of PBP 2019.

Recommendations:

Water Supplies - Water supplies are to be provided in accordance with the specifications set out in Table 7.4a of PBP 2019.

Electricity Services – Electricity power supply throughout the Subject Area will be either via new underground mains electricity service or a stand-alone off-grid photovoltaic electricity power supply and will be provided in accordance with the specifications set out in Table 7.4a of PBP 2019.

Gas Services – If provided, it is envisaged that gas supplies to any future residence will be reticulated natural gas supplies. Therefore, supplies and fittings must comply with the specifications set out in Table 7.4a of PBP 2019.

5 CONCLUSION

This report documents the findings from a Bush Fire Strategic Study conducted to support a planning proposal to rezone two parcels of land at 456 - 474 Plumpton Road, Rowan, that will significantly expand the residential areas to the south of the existing urban interface.

The report establishes the bushfire threat to the study area. It examines a range of principles for the concept subdivision proposal to be regarded as suitable for development and that any future development can satisfy the broad aims and objectives of PBP 2019.

The proposed rezoning of the Study area and concept subdivision is seen as being consistent with the principles of Strategic Planning under PBP 2019.

Due to the dominant grassland setting with isolated areas of remnant woodland vegetation on predominantly flat to slightly undulating topography, the surrounding environment poses a relatively low to moderate bushfire threat to the Study area. This threat can be moderated even further by adopting the standard suite of protection measures offered by PBP 2019, with which the proposed development can essentially comply.

The concept subdivision proposal provides adequate space for establishing and maintaining setbacks and APZs.

Access to the study area will be well provided with multiple access points to Plumpton Road, creating a loop road that traverses through the concept subdivision, providing connection with other internal roads within the estate. Future development of Rowan Village west of the Study Area will increase the number of road connections to the wider public road network.

Water supplies and other utilities will be capable of satisfying the acceptable solutions detailed in PBP 2019.

Based on the BFSS and the recommendations contained in this report, the proposed concept multi-lot residential subdivision will be capable of:

- ensuring land is suitable for development in the context of bushfire risk;
- ensuring new developments on BFPL will comply with PBP
- minimising reliance on performance-based solutions;
- providing adequate infrastructure associated with emergency evacuation and firefighting operations, and
- facilitating appropriate ongoing land management practices.

Therefore, the proposal is deemed capable of meeting the underlying principles of strategic planning and should be supported.

6 REFERENCE

- ePlanning Spatial Viewer, Department of Planning Industry and Environment, accessed 3 August 2023, <https://www.planningportal.nsw.gov.au/spatialviewer/#/find-a-property/address>
- FireMaps (FPA Australia, 2021), accessed 25 October 2023, <https://maps.fpaofiremaps.com.au>
- Keith D. (2004) "Ocean Shores to Desert Dunes", Department of Environment and Conservation, Sydney.
- NSW Rural Fire Service. (2019) "Planning for Bushfire Protection". Sydney (PBP 2019)
- SEED (NSW Government, 2022) NSW State Vegetation Type Map, accessed 25 October 2023, https://geo.seed.nsw.gov.au/Public_Viewer/index.html?viewer=Pblic_Viwer&locale=enAU&runWorkflow=AppendLayerCatalog&CatalogLayer=SEED_Catalog.185.Formation,SEED_Catalog.185.Class,SEED_Catalog.185.Labels,SEED_Catalog.185.Vegetation%20Group
- SEED (NSW Government, 2023) Fire Extent and Severity Mapping (FESM), accessed 30 October 2023, https://geo.seed.nsw.gov.au/Public_Viewer/index.html?viewer=Public_Viwer&locale=en-AU&runWorkflow=AppendLayerCatalog&CatalogLayer=SEED_Catalog.203.NPWS%20Fire%20History
- Six Maps, NSW Department of Finance and Services, accessed 3 August 2023, <https://maps.six.nsw.gov.au/#>
- Standards Australia, (2018) "AS/NZS 3959-2018 Construction of buildings in bushfire-prone areas."

ATTACHMENT A – APZs & LANDSCAPING

Inner protection areas (IPAs)

The IPA is the area closest to the asset and creates a fuel-managed area which can minimise the impact of direct flame contact and radiant heat on the development and be a defensible space. Vegetation within the IPA should be kept to a minimum level. Litter fuels within the IPA should be kept below 1cm in height and be discontinuous.

In practical terms the IPA is typically the curtilage around the dwelling, consisting of a mown lawn and well maintained gardens.

When establishing and maintaining an IPA the following requirements apply:

Trees:

- 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 ground
- canopies should be separated by 2 to 5m
- preference should be given to smooth barked and evergreen trees.

Shrubs:

- create large discontinuities or gaps in the vegetation 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)
- leaves and vegetation debris should be removed.

Outer protection areas (OPAs)

An OPA is located between the IPA and the unmanaged vegetation. Vegetation within the OPA can be managed to a more moderate level. The reduction of fuel in this area substantially decreases the intensity of an approaching fire and restricts the pathways to crown fuels; reducing the level of direct flame, radiant heat and ember attack on the IPA.

Because of the nature of an OPA, they are only applicable in forest vegetation.

In practical terms the OPA is an area where there is maintenance of the understorey and some separation in the canopy.

When establishing and maintaining an OPA the following requirements apply:

Trees:

- tree canopy cover should be less than 30%
- trees should have canopy separation
- canopies should be separated by 2 to 5m

Shrubs:

- shrubs should not form a continuous canopy
- shrubs should form no more than 20% of ground cover

Grass:

- should be kept mown (as a guide grass should be kept to no more than 100mm in height)
- leaf and other debris should be mown, slashed or mulched.

An APZ should be maintained in perpetuity to ensure ongoing protection from the impact of bush fires. Maintenance of the IPA and OPA to the standards given above should be undertaken on an annual basis, in advance of the fire season, as a minimum.

In Australia, bush fires are a natural and essential aspect of the landscape as many plants and animals have adapted to fire as part of their life cycle. However, development adjacent to bush land areas has increased the risk of fire impacting on people and their assets. The impact on property and life can be reduced with responsible preparation and management of bush fire hazards.

In combination with other BPMs, a bush fire hazard can be reduced by implementing simple steps in reducing vegetation levels. This can be done by designing and managing landscaping to implement an APZ around the property.

This Appendix sets the standards which need to be met within an APZ.

A4.1 Asset protection zones

An APZ is a fuel-reduced area surrounding a built asset or structure.

For a complete guide to APZs and landscaping, download the NSW RFS document *Standards for Asset Protection Zones* at: www.rfs.nsw.gov.au/resources/publications.

An APZ provides:

- a buffer zone between a bush fire hazard and an asset
- an area of reduced bush fire fuel that allows suppression of fire
- an area from which backburning or hazard reduction can be conducted,
- an area which allows emergency services access and provides a relatively safe area for firefighters and home owners to defend their property.

Potential bush fire fuels should be minimised within an APZ. This is so that the vegetation within the planned zone does not provide a path for the transfer of fire to the asset either from the ground level or through the tree canopy.

An APZ, if designed correctly and maintained regularly, will reduce the risk of:

- direct flame contact on the asset
- damage to the built asset from intense radiant heat
- ember attack.

The APZ should be located between an asset and the bush fire hazard.

The methodology for calculating the required APZ distance is contained within Appendix 1. The width of the APZ required will depend upon the development type. APZs for new development are set out within Chapters 5, 6 and 7 of this document.

In forest vegetation, the APZ can be made up of an inner protection area (IPA) and an outer protection area (OPA).

ATTACHMENT B - ACCESS

Table 7.4a *Continued*

PERFORMANCE CRITERIA	ACCEPTABLE SOLUTIONS
The intent may be achieved where:	
firefighting vehicles are provided with safe, all-weather access to structures and hazard vegetation.	property access roads are two-wheel drive, all-weather roads.
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.
there is appropriate access to water supply.	- hydrants are provided in accordance with the relevant clauses of AS 2419.1:2005; - There is suitable access for a Category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available.
firefighting vehicles can access the dwelling and exit the property safely.	- at least one alternative property access road is provided for individual dwellings or groups of dwellings that are located more than 200 metres from a public through road; - 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. In circumstances where this cannot occur, the following requirements apply: - minimum 4m carriageway width; - in forest, woodland and heath situations, rural property roads have passing bays every 200m that are 20m long by 2m wide, making a minimum trafficable width of 6m, at the passing bay; - a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches; - property access must provide a suitable turning area in accordance with Appendix 3; - curves have a minimum inner radius of 6m and are minimal in number to allow for rapid access and egress; - the minimum distance between inner and outer curves is 6m; - the crossfall is not more than 10 degrees; - maximum grades for sealed roads do not exceed 15 degrees and not more than 10 degrees for unsealed roads; and - a development comprising more than three dwellings has formalised access by dedication of a road and not by right of way. Note: Some short constrictions in the access may be accepted where they are not less than 3.5m wide, extend for no more than 30m and where the obstruction cannot be reasonably avoided or removed. The gradients applicable to public roads also apply to community style development property access roads in addition to the above.

A3.3 Vehicle turning head requirements

Dead ends that are longer than 200m must be provided with a turning head area that avoids multipoint turns. "No parking" signs are to be erected within the turning head.

The minimum turning radius shall be in accordance with Table A3.2. Where multipoint turning is proposed the NSW RFS will consider the following options:

Figure A3.3

Multipoint turning options.

