Wagga Wagga City Council

Planning Proposal

Amendment to the Wagga Wagga Local Environmental Plan 2010

LEP20/0006 – 39 Currawang Drive, Springvale

Date of Planning Proposal:

24 March 2021

Contact:

Crystal Atkinson
Senior Strategic Planner
Wagga Wagga City Council
Phone: 1300 292 442
Email: council@wagga.nsw.gov.au

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Contents

ADDENDUM

Council is in receipt of a planning proposal to amend the Wagga Wagga Local Environmental Plan. The application is provided in appendix 1.

A Gateway determination under Section 3.34 of the *Environmental Planning and Assessment Act 1979* is requested.

Council endorses the planning proposal with the following addendums:

- Explanation of provisions
- Justification
- State and commonwealth interests
- Mapping
- Community consultation
- Project timeline

A copy of the report and minutes is provided with the planning proposal.

Council is seeking delegations to make this plan as the matters contained in the Planning Proposal are of local significance. The evaluation criteria for the delegation of plan making functions checklist is provided. In addition, the completed Information Checklist is provided with this proposal.

PART 2 – EXPLANATION OF THE PROVISIONS

The outcomes are intended to be achieved by amending map sheets LZN_004E and LSZ_004E as shown below:

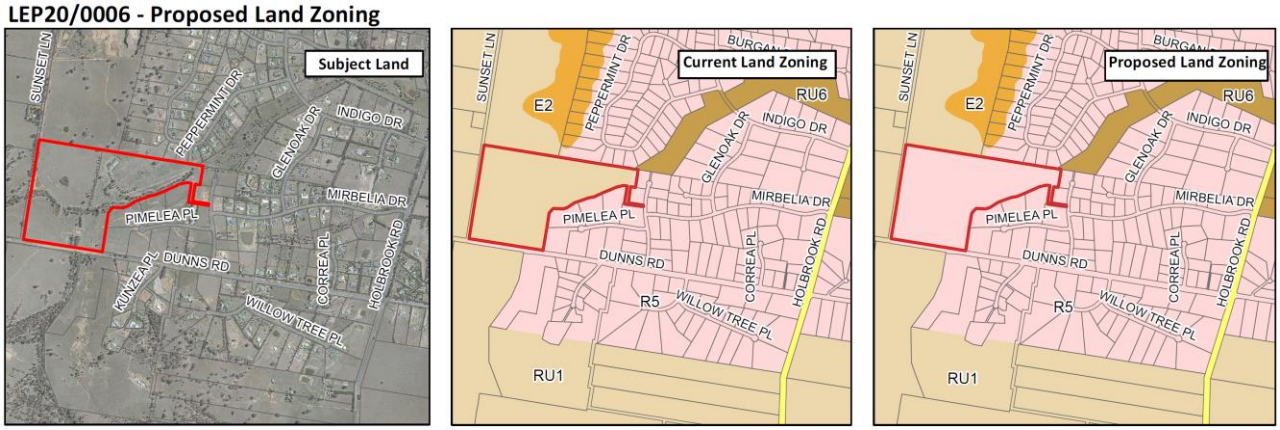

Figure 1: Proposed land zoning changes

LEP20/0006 - Proposed Lot Size (Addendum to Application)

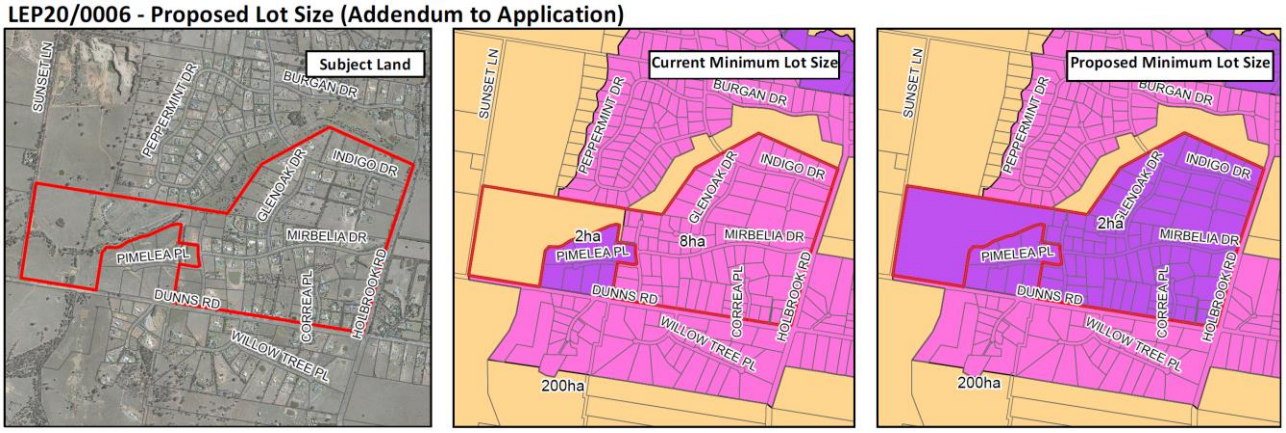

Figure 2: Proposed minimum lot size changes

Section D – State and Commonwealth interests

What are the views of State and Commonwealth public authorities consulted in accordance with the gateway determination?

No consultation has occurred with any public authorities prior to preparation and lodgement of the planning proposal.

The views of State and Commonwealth public authorities will be sought once the Gateway Determination has been issued.

PART 3 – JUSTIFICATION

This section of the Planning Proposal sets out the justification for the intended outcomes and provisions, and the process for implementation.

See Section 4.1 of the originally submitted Planning Proposal for further details regarding the strategic justification of the proposal.

Section A – Need for the planning proposal

Is the planning proposal the best means of achieving the objectives or intended outcomes, or is there a better way?

An assessment of the large lot residential precinct north of Dunns Road where an 8-hectare minimum lot size provision is applied shows the lot sizes to be predominantly 2 hectares. The lot size breakup of the precinct is shown in figure 3 and consists of the following:

- 59 lots less than 2 hectares – no subdivision potential
- 17 lots less than 3 hectares – no subdivision potential
- 2 lots less than 4 hectares – no subdivision potential
- 1 lot greater than 4 hectares – minimal subdivision potential

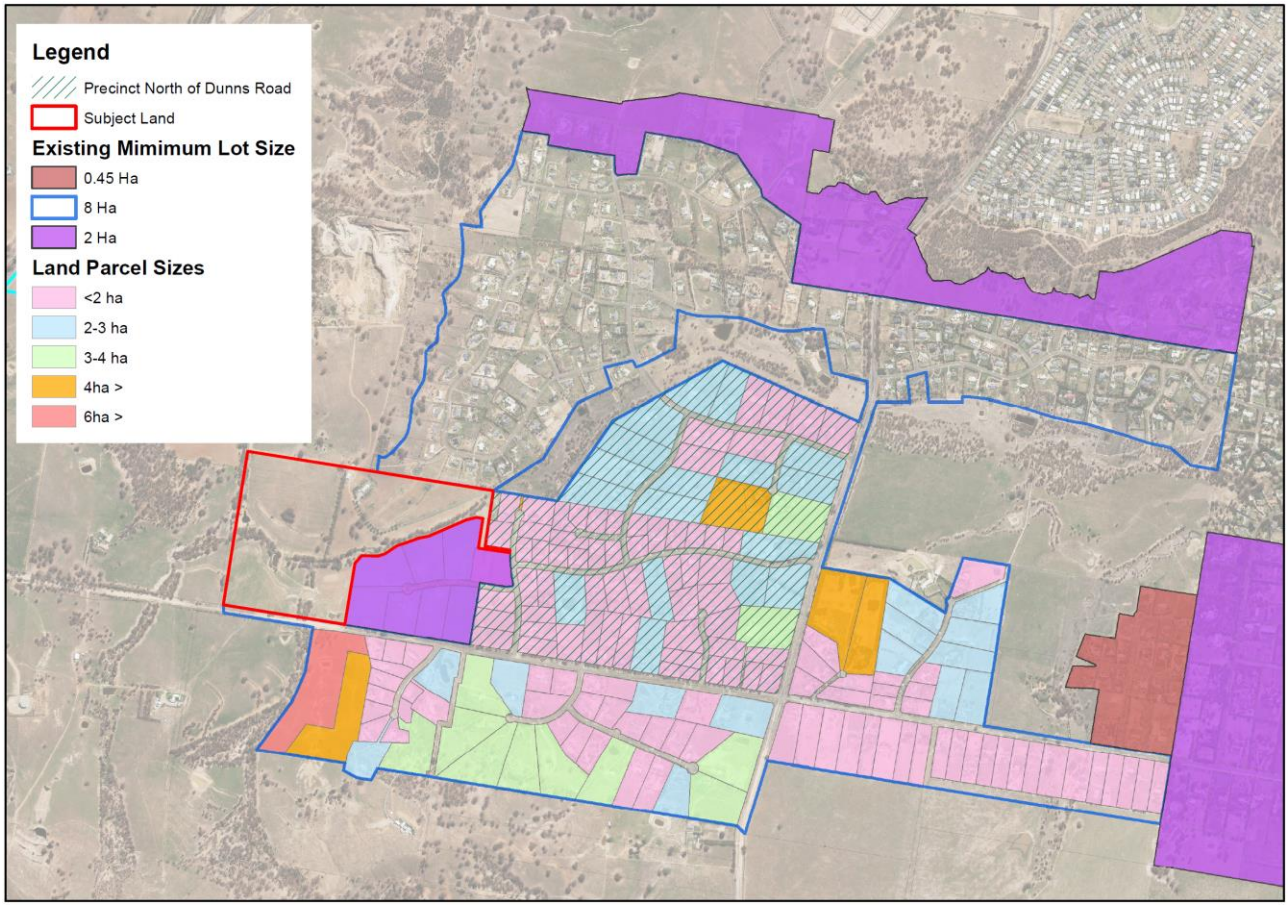

Figure 3: Lot size assessment

Based on the existing lot pattern, available services, and character of the area, it is proposed to expand the proposed reduction in minimum lot size to the precinct north of Dunns Road. Expanding the 2-hectare minimum lot size to this location will acknowledge the existing lot size pattern of the area.

Whilst there may be merit in considering a lot size smaller than 2 hectares, it is considered premature at this stage given the existing vegetation, natural hazards and land constraints and the sites distance from other existing suburbs of Lloyd and Bourkelands that contain smaller lot sizes. This area benefits from expansive environmental protection areas that provide corridors for habitat. Retaining larger lot sizes will help protect the environmental values within this area.

Further intensification to lots less than 2-hectares will require further detailed analysis of infrastructure capacity for a broader precinct. Given the applicant is proposing lot sizes of 2-hectares that utilise existing infrastructure, it is not considered appropriate to delay the proposal to undertake detailed analysis of infrastructure capacity to support a smaller lot size. In addition, the current treatment of Dunns Road limits the ability for the corridor to accommodate intensification of lots less than 2-hectares until significant grading and sealing is undertaken. Upgrades to Dunns Road are proposed, however, the full details are not yet known.

Progressing with a minimum lot size of 2-hectares will not result in significant changes to the existing lot pattern and can allow for consideration of smaller lot size in the future if appropriate.

The precinct south of Dunns Road has slightly different lot size pattern and could be considered as part of a separate proposal.

Section B – Relationship with strategic planning framework

Is the planning proposal consistent with applicable Ministerial Directions (s.9.1 directions)

An assessment of the proposal against relevant Ministerial Directions is provided in the table below.

See Section 4.2.4 of the originally submitted Planning Proposal for further details.

Section 9.1 Ministerial Directions	
Direction	**Compliance**
3.1 Residential Zones	The planning proposal is inconsistent with this direction as it is proposing to contain provisions that reduce the permissible residential density of the land through a minimum lot size. The inconsistency is of minor significance as the area is will be zoned R5 Large Lot Residential and is rural in nature. The area also immediately adjoins an existing R5 Large Lot Residential precinct and the minimum lot size provision is consistent with the existing lot size pattern.
3.4 Integrating Land Use and Transport	The planning proposal is inconsistent with this direction as it proposes a large lot residential area on the fringe of the city with no existing connections to walking and cycling. The inconsistency is minor in nature as it is an extension of an existing large lot residential precinct.
3.5 Development Near Regulated Airports and Defence Airfield	The planning proposal is consistent with this direction as it is of sufficient distance from the Kapooka Defence Base.
4.3 Flood Prone Land	The site has an overland flow path running from the north-eastern corner to the southern boundary of the site. This risk can be managed through subdivision design.
5.10 Implementation of Regional Plans	The planning proposal is consistent with this direction. The proposal is consistent with the regional strategy direction to build housing capacity to meet demand and proposed a range of lot sizes that will retain character and minimise the risk of land use conflicts.

PART 4 – MAPPING

The planning proposal seeks to amend the following maps:

Land Zone Map:
- LZN_004E

Lot Size Map:
- LSZ_004E

Council requests the ability to lodge the template maps at S3.36 stage rather than prior to exhibition. The maps provided as part of the planning proposal are detailed enough for public exhibition purposes.

PART 5 – COMMUNITY CONSULTATION

A 28-day public exhibition is suitable for this proposal.

The requirement to notify affected and adjoining land owners within the planning proposal will be met.

PART 6 – PROJECT TIMELINE

Task	**Anticipated timeframe**
Anticipated date of Gateway Determination	May 2021
Anticipated timeframe for completion of required technical information	N/A
Timeframe for Government agency consultation	June 2021
Commencement and completion dates for public exhibition.	June - August 2021
Dates for public hearing	N/A
Timeframe for consideration of submissions	September 2021
Timeframe for the consideration of a proposal post exhibition	October 2021
Date of submission to the Department to finalise the LEP	December 2021
Anticipated date RPA will make the plan	March 2022
Anticipated date RPA will forward to the Department for notification	May 2022

Appendix 1: Application to amend Wagga Wagga Local Environmental Plan.

City of Wagga Wagga

Civic Centre
Cnr Baylis & Morrow Sts
PO Box 20
Wagga Wagga NSW 2650

abn 56 044 159 537
p 1300 292 442
f 02 6926 9199
e council@wagga.nsw.gov.au
w www.wagga.nsw.gov.au

Application to amend Local Environmental Plan & Development Control Plan

Environmental Planning & Assessment Act 1979

Applicant Details

Title: Mr ☑ Mrs ☐ Ms ☐ Other

Given Name/s: Aaron

Surname: De Jong

Company:

ABN:

Postal Address: 39 Currawang Drive, Springvale Postcode: 2650

Phone Number: Mobile: 0438 212 715 Work:

E Mail: aarondejong@gmail.com

Signature: Date:

Office Use Only

LEP No: 20/0006

Date: 31/7/20

CSO: Kad

Site Details

Address: 39 Currawang Drive, Springvale

Lot No. 21 Section DP / SP 1218487

Description of Planning Proposal

☑ LEP Amendment ☐ DCP Amendment

Rezoning of property from RU1 to R5 and an amendment to the minimum lot size to 2,000sqm

RECEIVED 31 JUL 2020 WWCC CSO

Pre-Lodgement Meeting

Prior to lodging your application, you need to have a pre-lodgement meeting to ensure that you have sufficient information. Have you phoned Council's Strategic Planners on 1300 292 442 to make an appointment?

☐ Yes ☐ No If yes, whom did you phone Adriaan Stander and Adam Wood

Applicant and Landowner Declaration

If you are the applicant, are you:

- ☐ 1. A Wagga Wagga City Councillor?
- ☐ 2. A Wagga Wagga City Council Staff Member?
- ☐ 3. A company where a director of the company is a person referred to at 1 or 2 above?
- ☐ 4. Acting on behalf of a person or company referred to at 1,2, or 3 above?
- ☐ 5. A relative of a person referred to at 1 or 2 above?
- ☐ 6. A company where a director of the company is a relative of a person referred to at 1 or 2 above?
- ☐ 7. Acting on behalf of a person or company referred to at 5 or 6 above?
- ☑ 8. None of the above

If you are the land owner, are you:

- ☐ 1. A Wagga Wagga City Councillor?
- ☐ 2. A Wagga Wagga City Council Staff Member?
- ☐ 3. A company where a director of the company is a person referred to at 1 or 2 above?
- ☐ 4. A relative of a person referred to at 1 or 2 above?
- ☐ 5. A company where a director of the company is a relative of a person referred to at 1 or 2 above?
- ☑ 6. None of the above

Consent of ALL owner(s) of the subject property

I declare that all the information in this application is to the best of my knowledge, true and correct. I also understand pursuant to the Environmental Planning and Assessment legislation that if the information is incomplete the application may be delayed, rejected, or refused without notice. I acknowledge that if the information provided is misleading any approval granted 'may be void'. I agree to the use of the documentation provided in support of this application for advertising and notification purposes.

Name	Aaron De Jong	Signature	A. degong
Name	Amanda De Jong	Signature	A. degong
Name		Signature	

Notes:

- If there is more than one landowner, every owner must sign
- Company Ownership – A company can provide owners consent with or without a common seal and the application or authorisation letter must be signed by:
  - a) two (2) directors of the company; or
  - b) a director and a company secretary of the company; or
  - c) for a proprietary company that has a sole director who is also the sole company secretary – that director.

Copyright and Privacy

Please be advised that Council may make copies (including electronic copies) of the planning proposal and accompanying documents for the purpose of complying with its obligations under the Environmental Planning and Assessment Act 1979, the Local Government Act 1993 and Council's Notification Policy. In addition, Council may make such further copies as, in its opinion are necessary to facilitate a thorough consideration of the planning proposal. This may include making copies of the advertised plans, supporting documentation on Council's website to be viewed or printed out by members of the public. The Applicant is responsible for obtaining all copyright licences necessary from the copyright owners for this purpose.

Office Use Only

The fees and charges payable are in accordance with Council's Revenue and Pricing Policy at the time of lodgement.

- ☐ Minor LEP amendment (Low Complexity)
- ☐ Medium LEP Amendment (Medium Complexity)
- ☐ Major LEP Amendment (High Complexity)
- ☐ Minor DCP Amendment to (Existing chapter / control) (Low Complexity)
- ☐ Major DCP Amendment (New chapter / new controls)

Receipt No: _____ Amount: $ _____ Cheque Requisite: ☐ Yes ☐ No

The General Manager
Wagga Wagga City Council
PO Box 20
WAGGA WAGGA NSW 2650

RE: PLANNING PROPOSAL APPLICATION – 39 CURRAWANG DRIVE, SPRINGVALE

Dear Sir,

I am writing in relation to the accompanying application in respect of 39 Currawang Drive, Springvale.

I authorise MJM Consulting Engineers to act on my behalf in relation to this application, to make any necessary enquiries and to provide additional details. Please also extend a copy of any correspondence to MJM Consulting Engineers via email to planning@mjm-solutions.com

Thank you in advance.

Applicant for the development:

Aaron De Jong

Date:

Jenna Amos

From: Wood, Adam <Wood.Adam@wagga.nsw.gov.au>
Sent: Friday, 24 July 2020 2:09 PM
To: mjm jenna
Subject: RE: 39 Currawang Drive Planning Proposal lodgement fees

Hi Jenna

Correct, both of those due at lodgement.

Regards

Adam Wood
Strategic Town Planner

1300 292 442
d +61 2 6926 9555 | **e** Wood.Adam@wagga.nsw.gov.au
Wagga Wagga City Council · 243 Baylis Street (PO Box 20) · Wagga Wagga NSW 2650

Committed to a thriving, innovative, connected and inclusive city

From: Jenna Amos <jenna.amos@mjm-solutions.com>
Sent: Friday, 24 July 2020 1:04 PM
To: Wood, Adam <Wood.Adam@wagga.nsw.gov.au>
Cc: sortingout@mjm-solutions.com
Subject: RE: 39 Currawang Drive Planning Proposal lodgement fees

Thanks Adam. Is it only the $44,000 for lodgement and processing due at time of lodgement?

Kind regards,
[170514]

Jenna Amos
Planning Manager

MJM Consulting Engineers
Structural • Civil • Building Design • Planning

Wagga Wagga
Level 1, 37 Johnston St
(02) 6921 8333

Griffith
Level 1, 130 Banna Ave
(02) 6962 9922

www.facebook.com/MJMConsultingEngineers

From: Wood, Adam <Wood.Adam@wagga.nsw.gov.au>
Sent: Friday, 24 July 2020 11:50 AM
To: mjm jenna <jenna.amos@mjm-solutions.com>
Subject: RE: 39 Currawang Drive Planning Proposal lodgement fees

Hi Jenna,

This will be categorized as a complex application due to:

- the requirement for adequate servicing capacity to be demonstrated in detail by a study
- the requirement for overland flooding to be considered by a study, including implications of cumulative impacts to affect existing development and the ability to procure safe access.

Fees for a complex development application are:

Lodgement of planning proposal: $22,000.00
Processing of planning proposal: $22,000.00
DCP amendment (if required): $22,000.00

Best regards,

Adam Wood
Strategic Town Planner

1300 292 442
d +61 2 6926 9555 | **e** Wood.Adam@wagga.nsw.gov.au
Wagga Wagga City Council · 243 Baylis Street (PO Box 20) · Wagga Wagga NSW 2650

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From: Jenna Amos <jenna.amos@mjm-solutions.com>
Sent: Thursday, 9 July 2020 8:23 AM
To: Wood, Adam <Wood.Adam@wagga.nsw.gov.au>
Cc: sortingout@mjm-solutions.com
Subject: 39 Currawang Drive Planning Proposal lodgement fees

Good morning Adam,

Can you please advise if the fees for lodgement of this planning proposal would be standard ($8000) or complex ($22,000)?

Kind regards,
[170514]

Jenna Amos
Planning Manager

MJM Consulting Engineers
Structural • Civil • Building Design • Planning

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Planning Proposal Checklist

Before preparing your Planning Proposal, speak to Council's Strategic Planning Section to seek advice prior to **preparing** a planning proposal.

Checklist	Applicant	Office Use
Complete the Application Form 1. The form needs to be signed by ALL land owners	✓	
Pay the fees & charges as per Council's Fees and Charges Policy 2. The amount will vary depending on the complexity of the amendment. Council staff will confirm the fees prior to lodgement.	✓	
Required Information 3. Objectives Statement This is a short statement setting out the objectives of the planning proposal. 4. Explanation Statement A more detailed statement of how the LEP will be amended to achieve the objectives 5. Need for the Planning Proposal If the planning proposal implements the outcome of a strategic study or report, the key findings need to be explained. The planning proposal needs to demonstrate the best means of achieving the objectives, and what alternatives have been considered. 6. Relationship to Strategic Planning Framework The planning proposal needs to demonstrate that the objectives and actions of the Riverina Murray Regional Plan 2017, Community Strategic Plan 2040 – Wagga View and Wagga Wagga City Council Spatial Plan 2013 – 2043 have been considered. The planning proposal also needs to consider relevant State Environmental Planning Policies & applicable Ministerial Directions. 7. Environmental, Social & Economic Impacts The planning proposal needs to identify if there are any potential critical habitats or threatened species, and how	✓ ✓ ✓ ✓ ✓	

other environmental effects such as flooding or bushfire will be managed. The planning proposal needs to include any effects on items or places of European or Aboriginal Culture and adequately address other social infrastructure impacts such as on schools.		
8. State & Commonwealth Interests The planning proposal needs to indicate if there is adequate public infrastructure and whether or not the views of State and Commonwealth public authorities have been obtained.	✓	
9. Site analysis of property & surrounding environment Include an analysis of the site conditions and the relationship to the surrounding area.	✓	
10. Mapping Include a map that shows the location of the site, a map that shows the existing zoning, lot size, floor space ratio or building height etc. and a map with the proposed zoning, lot size, floor space ratio or building height etc.	✓	
11. Supporting Studies Include any specialist studies.	✓	
Pre-Lodgement Meeting 12. Make an appointment with Council Staff before lodging the planning proposal.	✓	

2020

Rezone property from RU1 Primary Production to R5 Large Lot Residential and reduce minimum lot size

39 Currawang Drive, Springvale

Planning Proposal

Prepared for A. de Jong

MJM
CONSULTING ENGINEERS
CIVIL • STRUCTURAL • BUILDING DESIGN • PLANNING

REPORT REFERENCE [170514]

Document Verification Schedule

MJM CONSULTING ENGINEERS
CIVIL • STRUCTURAL • BUILDING DESIGN • PLANNING

Project

Planning Proposal

39 Currawang Drive, Springvale

Revision	Date	Prepared By		Checked By		Approved By	
Draft	18.02.20	Name	Jenna Amos	Name	Jenna Amos	Name	Jenna Amos
Second Draft	04.05.20	Name	Jenna Amos	Name	Michael McFeeters	Name	Michael McFeeters
Final	31.07.20	Name	Jenna Amos	Name	Michael McFeeters	Name	Michael McFeeters

MJM CONSULTING ENGINEERS

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Web **www.mjm-solutions.com**

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TABLES

FIGURES

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INTRODUCTION

BACKGROUND

MJM Consulting Engineers were approached by the current owner of 39 Currawang Drive, Springvale, seeking advice in relation to the potential rezoning and subdivision opportunities presented by the. MJM had prepared a planning proposal for the property in 2012 for the previous owner which effectively resulted in a 'zoning swap' between existing portions of R5 Large Lot Residential and RU1 Primary Production within the property boundary. The previous planning proposal also reduced the minimum lot size of the R5 zoned portion from 8Ha to 2Ha. This resulted in 'back zoning' of part of the property which was previously zoned R5.

The below figure depicts the zoning proposed by the previous planning proposal where the area shown as RU1 was previously R5, and the area shown as R5 was previously RU1.

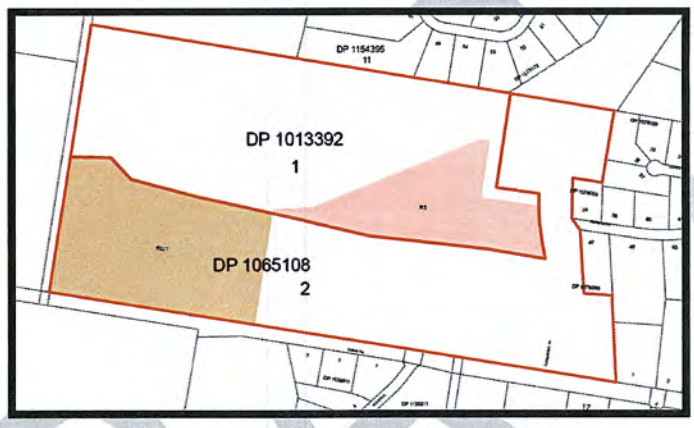


Figure 1 Previous planning proposal zoning outcome map (Source: WWCC)

The previous planning proposal was driven by the fact that the proposed subdivision within the R5 portion of the property would have required access from Dunns Road which, as stated in Council's report for the proposal, would have required a costly upgrade to Dunns Road which was not commercially viable at the time. Further to this, Riverina Water infrastructure did not have capacity to service more than the proposed additional lots at the time.

Given that Council is in the process of undertaking an upgrade to Dunns Road to Australia Standards and Riverina Water now have capacity to service proposed additional allotments, the rezoning of the residual RU1 zoned area of the property to R5 Large Lot Residential, and a reduction to the minimum lot size to 2Ha, is now considered reasonable to facilitate further subdivision of the property. The proposal would effectively 'complete' Springvale to its previously intended western extent.

SITE DESCRIPTION

The site is known 39 Currawang Drive, Springvale and is legally described as Lot 21 DP 1218487. It is located approximately 11km south west of the Wagga Wagga CBD as shown in the below figure.

Figure 2 Distance from Wagga Wagga CBD (Source: Google Maps)

The site is irregular in shape and has an area of approximately 40.6 Ha as shown in the below figure.

Figure 3 Locality Plan (Source: WWCC)

The site has frontage to Currawang Drive, Dunns Road and Sunset Lane. The eastern Currawang Drive frontage is 10 metre long and is located approximately 30 metres north of the Mirbelia Drive intersection. This frontage is also the site's current access. The southern Dunns Road frontage is approximately 480 metres in length and is located approximately 650 metres west of the Currawang Drive intersection. The western Sunset Lane frontage is approximately 605 metres long and begins at the intersection of Sunset Lane and

Dunns Road. It is noted that although Wagga Wagga City Council base mapping shows the Sunset Lane frontage, this is currently undeveloped and not trafficable as shown in the below figure.

Figure 4 Aerial image showing undeveloped Sunset Lane frontage undeveloped (Source: WWCC)

This property is encumbered by a 2-metre-wide easement to drain sewer along the small frontage to Currawang Drive, and between the rear boundary of 20 Pimelea Place, and 45 Currawang Drive, as shown in the below figure.

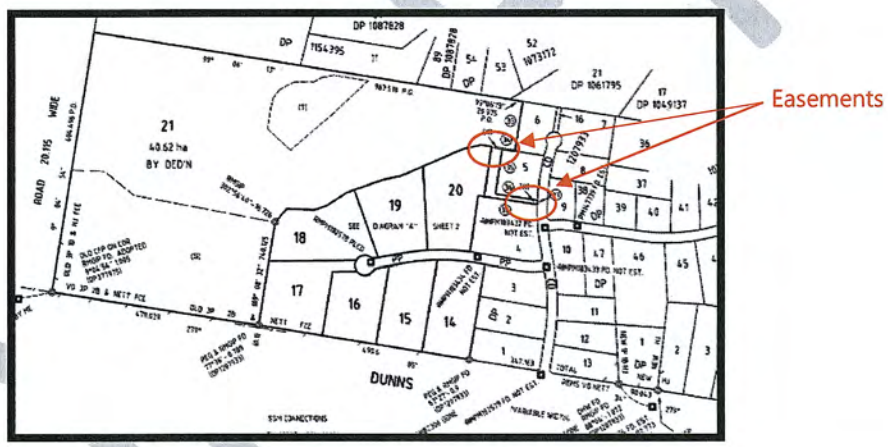


Figure 5 Extract from DP12181487 (Source: WWCC)

The site topography and creek lines located within the bounds of the site are shown in the below figure.

Figure 6 Topographic Map (Source: WWCC)

The site falls from almost mid way along the northern boundary at a grade of approximately 5 percent to the south west, and at a grade of approximately 7 percent to the east.

PART 1. OBJECTIVES OR INTENDED OUTCOMES

The objective of this Planning Proposal is to rezone the site from RU1 Primary Production to R5 Large Lot Residential and amend the minimum lot size applicable to the property from 200 Ha to 2 Ha. The 2 Ha minimum lot size would allow further subdivision of the property to a size consistent with the surrounding subdivision pattern of the area.

PART 2. EXPLANATION OF PROVISIONS

The objective in Part 1 will be achieved by:

- Amending the Wagga Wagga Local Environmental Plan 2010 (WWLEP 2010) Land Zoning Map to change the zoning of the property from RU1 Primary Production to R5 Large Lot Residential as shown in Appendix A; and
- Amending the WWLEP 2010 Minimum Lot Size Map to reduce the minimum lot size of the property from 200 Ha to 2 Ha as shown in Appendix B.

PART 3. JUSTIFICATION

SECTION A. NEED FOR THE PLANNING PROPOSAL

A1. IS THE PLANNING PROPOSAL A RESULT OF AN ENDORSED LOCAL STRATEGIC PLANNING STATEMENT, STRATEGIC STUDY OR REPORT?

The planning proposal would contribute to action items contained in the Wagga Wagga City Council Spatial Plan 2013/2043, specifically:

1. "Review allocation of residential zoning";
2. "Identify sites suitable for redevelopment and investigate the potential to concentrate development infill sites to accommodate future growth"; and
3. "Development is to occur in liaison with infrastructure providers to ensure efficient and cost effective provision of services".

Further to the above, the subject site is partly located within the 'Potential Urban Area', Area 4 which is identified in the Spatial Plan as below:

> *Area 4 – Dunns Road, Kapooka / Uranquinty: The subject area is partially bush fire prone land and contains a significant ridgeline. The zone and minimum lot size will be considered after the outcomes of the residential study are known. The land will provide for Large Lot Residential / Rural Small Holding lifestyle blocks. The subject area is in the vicinity of a 'potential road connection' identified on the Transport Map. The rezoning of this land should be done in conjunction with the planning and investigation of the identified 'potential road connection'.*

Area 4, as identified in the Spatial Plan, is shown in the figure on the following page.

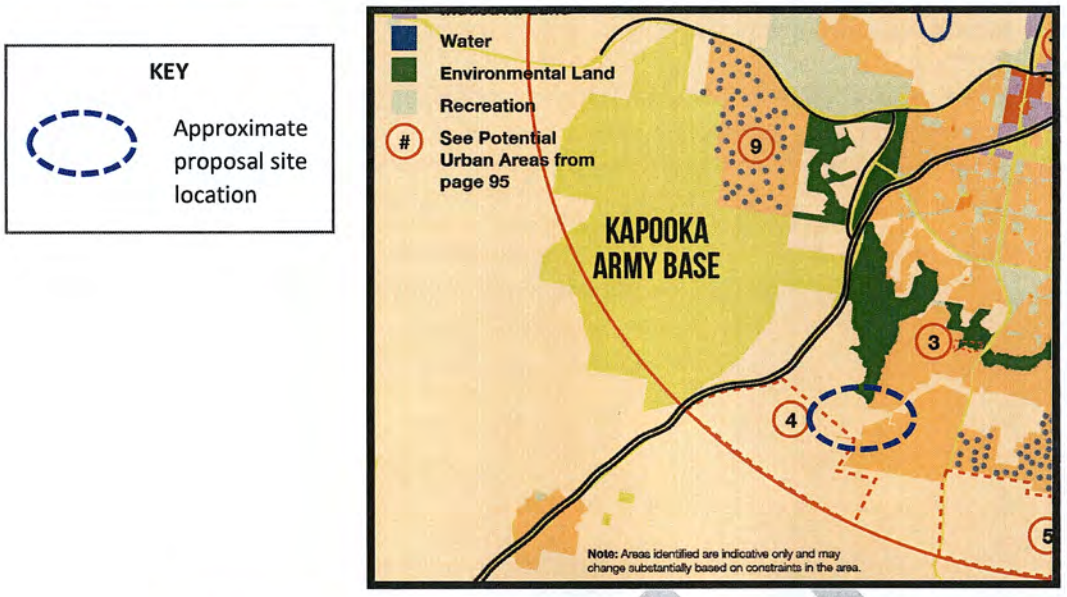


Figure 7 Wagga Wagga City Council Spatial Plan 2013/2043 (Source: WWCC Spatial Plan 2013/2043)

This proposal would contribute to the review of allocation of residential zoning, identify a site suitable for redevelopment and would contribute to infill development which would assist in accommodating future residential growth within the Wagga Wagga LGA as part of the Wagga Wagga to 100,000 by 2038 campaign.

Liaison has been undertaken with infrastructure providers to ensure efficient and cost effective provision of services in redevelopment of the site. This is discussed further on in this proposal.

Further to this, the site is partly located within a 'Potential Urban Area', Area 4, of the Wagga Wagga City Council Spatial Plan 2013/2043 and would provide for additional Large Lot Residential parcels of land.

It is also noted that an objective identified in the Wagga Wagga Community Strategic Plan 2040 includes "We plan for the growth of the city". The proposal would contribute to the identified outcome of "we have housing that suits our needs" and strategies to achieve this including "Provide a range of accessible and affordable housing for people from all income levels and stages of life" and "Maintain a point of difference in our housing market".

A2. Is the planning proposal the best means of achieving the objectives or intended outcomes, or is there a better way?

The intended outcome of this Planning Proposal can only be achieved through a rezoning of the site from RU1 Primary Production to R5 Large Lot Residential and a reduction in the minimum lot size from 200 Ha to 2 Ha.

SECTION B. RELATIONSHIP TO STRATEGIC PLANNING FRAMEWORK

B1. WILL THE PLANNING PROPOSAL GIVE EFFECT TO THE OBJECTIVES AND ACTIONS OF THE APPLICABLE REGIONAL, OR DISTRICT PLAN OR STRATEGY (INCLUDING ANY EXHIBITED DRAFT PLANS OR STRATEGIES)?

Strategic merit

i. *Will the planning give effect to the relevant regional plan outside the Greater Sydney Region, the relevant district plan within the Greater Sydney Region, or corridor/precinct plans applying to the site, including any draft regional, district or corridor/precinct plans released for public comment?*

The planning proposal would give effect to goals, directions and actions of the Riverina Murray Regional Plan 2036 as identified below:

- *Goal: Strong, connected and healthy communities*
  - Direction 27: Manage rural residential development
    - Action 27.2: Locate new rural residential areas:
      - in close proximity to existing urban settlements to maximise the efficient use of existing infrastructure and services, including roads, water, sewerage and waste services and social and community infrastructure;
      - to avoid or minimise the potential for land use conflicts with productive, zoned agricultural land and natural resources; and
      - to avoid areas of high environmental, cultural and heritage significance, important agricultural land or areas affected by natural hazards.

Comment: The property adjoins a large area of an existing urban settlement on its eastern, and part of its northern and southern boundaries therefore the planning proposal would facilitate new rural residential development within the vicinity of existing urban settlements which would maximise the efficient use of existing infrastructure and services.

The site and those to the west and part of the north and southern boundaries are zoned RU1 Primary Production. Aerial imagery shows this land being utilised for residential uses and on occasion for grazing purposes. The subject land and the RU1 land surrounding is identified on the Land and Soil Capability Mapping for NSW as being classified as Class 4, 5 and 7 being moderate to severe limitations, severe limitations and extremely severe limitations respectively. This means that the agricultural capability of the property itself and the surrounding RU1 land is restricted to an extent and therefore it is reasonable to consider that the proposal would not result in land use conflicts with productive or zoned agricultural land, and that the site and those surrounding would not be considered to be 'important agricultural land'.

The site or surrounding properties are not identified as containing natural resources.

The property is not identified as containing high environmental significance. An Initial Biodiversity Assessment was undertaken by NGH Consulting to support the proposal based on four alternative potential subdivision layout options which are attached to this report as Appendix G. The biodiversity assessment concluded that further development of the

property could be sited and managed so as to preserve most of the native vegetation identified on the site, and therefore a significant impact to threatened species or ecological communities, or their habitats, is considered unlikely. NGH has also noted that depending on the favoured subdivision layout, the requirements of the Biodiversity Assessment Method may be triggered and offset obligations would be undertaken by the developer as required. The NGH assessment is attached to this report as Appendix C.

The site is not identified as containing high cultural or heritage significance. An AHIMS search was carried out on 26th January 2020 to determine if the property contained any registered sites or place of aboriginal heritage significance. A copy of the search results are attached to this report as Appendix D. The search did not identify any sites or places of aboriginal heritage on the site or within a 1,000 metre buffer of its boundaries. Should further investigation of the site be required, an Aboriginal Cultural Heritage Assessment could be undertaken to accompany any future Development Application to Council for further development of the property.

The site is identified as being affected by overland flow flooding however this is localised to the existing creek line. MJM prepared a Hydrology Report to assess the site drainage in respect of further development. The Hydrology Report is attached to this proposal as Appendix E. The report notes that further development of the property would result in higher peak flow rates due to a higher proportion of impervious area, and therefore potential for higher velocity flows which would lead to less time of concentration for overland rainfall within natural flow paths. Any further development of the property would be designed to ensure post-development flows do not exceed pre-development flows to account for effects of development on the existing site hydrology.

A portion of the site adjacent to the western property boundary is identified as being located within the bushfire prone land buffer area as identified in the below figure.

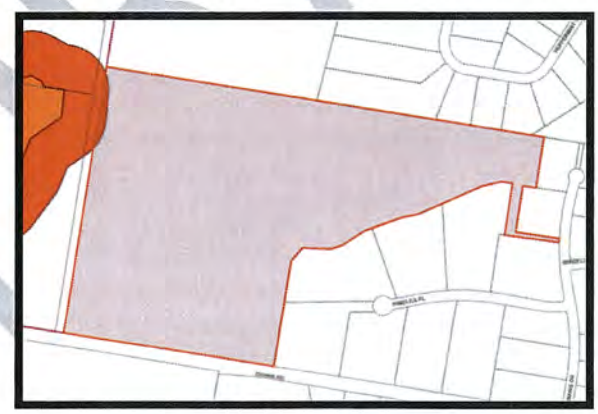


Figure 8 Bushfire prone land Map (Source: WWCC)

Given the bushfire prone land identification of the site, and the vegetation classification within the site including 'grassland', a bushfire assessment was undertaken by Southern Bushfire Solutions. A copy of the assessment is attached to this report as Appendix F.

The assessment was based on four potential subdivision layouts of the property as detailed in Appendix G of this report. The report found that the proposed minimum lot size of 2Ha would allow sufficient area for creation of APZ's within each potential new lot to protect any future residential development. The report also provided a number of recommendations which would be implemented as part of any future development of the

site, subject to Planning Proposal and subsequent Development Application consent. The site is therefore considered to be suitable for rural residential development as the potential bushfire hazard would be able to be mitigated as detailed in the attached bushfire assessment report.

ii. Will the planning proposal give effect to relevant local strategic planning statement or strategy which has been endorsed by the Department or required as part of a regional or district plan or local strategic planning statement?

Wagga Wagga City Council does not yet have a local strategic planning statement. As discussed previously in this report, the Wagga Wagga City Council Spatial Plan 2013/2043 includes the following actions:

1. "Review allocation of residential zoning";
2. "Identify sites suitable for redevelopment and investigate the potential to concentrate development infill sites to accommodate future growth"; and
3. "Development is to occur in liaison with infrastructure providers to ensure efficient and cost effective provision of services".

Further to the above, the subject site is partly located within the 'Potential Urban Area', Area 4 which is identified in the Spatial Plan as below:

> *Area 4 – Dunns Road, Kapooka / Uranquinty: The subject area is partially bush fire prone land and contains a significant ridgeline. The zone and minimum lot size will be considered after the outcomes of the residential study are known. The land will provide for Large Lot Residential / Rural Small Holding lifestyle blocks. The subject area is in the vicinity of a 'potential road connection' identified on the Transport Map. The rezoning of this land should be done in conjunction with the planning and investigation of the identified 'potential road connection'.*

Area 4, as identified in the Spatial Plan, is shown previously in Figure 6.

It is also noted that an objective identified in the Wagga Wagga Community Strategic Plan 2040 includes "We plan for the growth of the city". The proposal would contribute to the identified outcome of "we have housing that suits our needs" and strategies to achieve this including "Provide a range of accessible and affordable housing for people from all income levels and stages of life" and "Maintain a point of difference in our housing market".

The proposal would give effect to the actions identified above within the WWCC Spatial Plan, as well as to the objective, outcome and strategies identified above from the Wagga Wagga Community Strategic Plan.

iii. Is the planning proposal responding to a change in circumstances, such as the investment in new infrastructure or changing demographic trends that have not been recognised by existing planning controls?

The planning proposal is responding to a change in circumstances which is presented by the proposed upgrade of Dunns Road being undertaken by Wagga Wagga City Council,

and by the increased service capacity of Riverina Water to be able to provide potable water to additional allotments.

As discussed previously in this report, MJM had prepared a planning proposal for the property in 2012 for the previous owner which effectively resulted in a 'zoning swap' between existing portions of R5 Large Lot Residential and RU1 Primary Production within the property boundary. It also reduced the minimum lot size of the R5 zoned portion from 8Ha to 2Ha. This resulted in 'back zoning' of part of the property which was previously zoned R5.

The below figure depicts the zoning proposed by the previous planning proposal where the area shown as RU1 was previously R5, and the area shown as R5 was previously RU1.

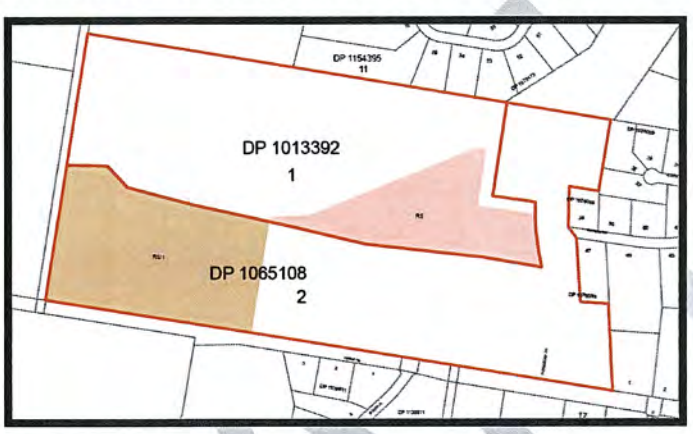


Figure 9 Previous planning proposal zoning outcome map (Source: WWCC)

The previous planning proposal was driven by the fact that the proposed subdivision within the R5 portion of the property would have required access from Dunns Road which, as stated in Council's report for the proposal, would have required a costly upgrade to Dunns Road which was not commercially viable at the time. A copy of this report accompanies this proposal as Appendix H. Further to this, Riverina Water infrastructure did not have capacity to service more than the proposed additional lots at the time.

Given that Council is in the process of undertaking an upgrade to Dunns Road to Australia Standards and Riverina Water now have capacity to service proposed additional allotments, the rezoning of the residual RU1 zoned area of the property to R5 Large Lot Residential, and a reduction to the minimum lot size to 2Ha, is now considered reasonable to facilitate further subdivision of the property. The proposal would effectively 'complete' Springvale to its previously intended western extent.

Further to this, the planning proposal is identifying a parcel of land which could be zoned to facilitate infill development which would provide land for additional housing in the city at a larger lot size which is not currently in major supply. It would contribute to the Wagga Wagga population target of 100,000 people by 2038 without putting unreasonable demand on existing infrastructure or requiring provision of Council-funded new infrastructure.

It is noted that the site is not identified as prime agricultural land and its development for Large Lot Residential purposes would not conflict with surrounding agriculturally zoned land which is only suitable for small scale grazing activities.

Site-specific merit

i. Does the planning proposal respond to the natural environment (including known significant environmental values, resources and hazards)?

Biodiversity

The site is identified as 'Biodiversity' on the WWLEP 2010 Terrestrial Biodiversity Map as shown in the below figure.

Figure 10 Extract from WWLEP 2010 Terrestrial Biodiversity Map (Source: WWCC)

Due to the extent of terrestrial biodiversity identified on the site, NGH Consulting prepared a biodiversity assessment of the site (Appendix C of this report) based on four potential future subdivision layouts. The assessment found one EEC occurs within the property and a number of threated species may potentially occur within the proposal area. It is however concluded that further development of the property could be sited and managed so as to preserve most of the native vegetation identified on the site, and therefore a significant impact to threatened species or ecological communities, or their habitats, is considered unlikely. NGH has also noted that depending on the favoured subdivision layout, the requirements of the Biodiversity Assessment Method may be triggered and offset obligations would be undertaken by the developer as required.

As such, it is considered that the site would be capable of supporting Large Lot Residential development which would be unlikely to significantly impact on the biodiversity values of the property through careful design of any future subdivision development.

Vulnerable Land

The site is identified as 'Vulnerable Land' on the WWLEP 2010 Vulnerable Land Map as shown in the figure on the following page.

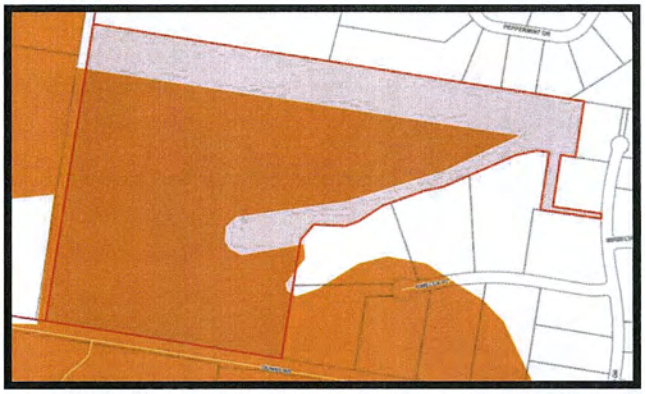


Figure 11 Extract from WWLEP 2010 Vulnerable Land Map (Source: WWCC)

The objectives of this clause are to protect, maintain or improve the diversity and stability of landscapes. The site does not contain steep slopes or shallow soils which would restrict development. It is not subject to soil salinity or contain a high proportion of rock outcropping. The site is not subject to permanent inundation and the accompanying biodiversity assessment (Appendix C) confirms further subdivision development of the property would be compatible with the native vegetation identified on the site.

Waterway

The site is identified as 'Water' and 'Waterway' on the WWLEP 2010 Water Resource Map as shown in the below figure.

Figure 12 Extract from WWLEP 2010 Water Resource Map (Source: WWCC)

The site also contains a natural creek line as identified in the figure on the following page.

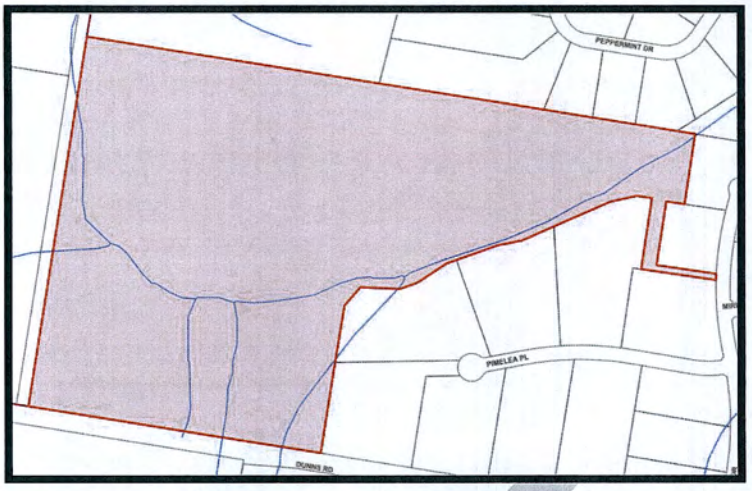


Figure 13 Hydrology Map (Source: WWCC)

Any further development of the property would consider the creek line and any further residential development of the site would be designed sited and managed to avoid any potential adverse impact on water quality, ecosystems and aquatic organisms. Information provided by Council confirmed that the site is subject to overland flow flooding however this is localised to the creek line and as such there is sufficient area on the site which would be unaffected by flooding and be able to support further residential development of the property.

ii. *Does the planning proposal respond to the existing uses, approved uses, and likely future uses of land in the vicinity of the proposal?*

The properties to the west, part of the northern boundary and opposite the sites southern boundary are zoned RU1 Primary Production. Aerial imagery shows these properties being utilised for residential uses and at times for grazing purposes. The RU1 land surrounding the site is identified on the Land and Soil Capability Mapping for NSW as being classified as Class 4, 5 and 7 being moderate to severe limitations, severe limitations and extremely severe limitations respectively as detailed previously in this report. As such the agricultural capability of the surrounding RU1 land is restricted to an extent and extensive agricultural use which may conflict with potential large lot residential development of the subject property is unlikely.

Land to the east, part of the north and opposite the southern boundary are zoned R5 Large Lot Residential with a lot size the same as, or less than, that proposed by this application and as such existing and potential future development of these properties is unlikely to conflict with potential large lot residential development of the subject property.

It is therefore considered that the proposal is unlikely to result in a conflict in land use with that of the surrounding area due to the past, present and likely future uses of land in the vicinity of the proposal.

iii. Does the planning proposal provide the services and infrastructure that are or will be available to meet the demands arising from the proposal and any proposed financial arrangements for infrastructure provision?

The planning proposal will not require the provision of services or infrastructure. Should the planning proposal be successful, further development of the property for R5 Large Lot Residential purposes would require services and infrastructure including water, electricity, telecommunications, sewer and roads.

Water

Discussions have been undertaken with Riverina Water County Council (RWCC) as to the serviceability of up to 15 additional 2Ha lots should the proposal be successful. RWCC were provided with the potential subdivision layout plans included as Appendix G to this proposal. RWCC advised that they would have capacity and ability to service the majority of lots depicted in the potential subdivision layout plans. They did however note that there would be issues with servicing lots located above the 270 AHD contour which in the potential subdivision plans could be up to three new allotments. It is however noted that the existing dwelling on the property is located above the 270 AHD contour and is serviced by RWCC through provision of a connection below the 270 AHD which pumps to a storage tank located above the 270 AHD to service the dwelling. RWCC were approached as to the suitability of a similar servicing arrangement for lots located above the 270 AHD however at the time of preparation of the planning proposal advice had not been received. Should RWCC not be able to service allotments above the 270 AHD contour, any potential future subdivision of the property would be designed to consider this constraint. The initial advice from RWCC is attached to this proposal as Appendix I.

Electricity

Essential Energy servicing capabilities have been investigated and electrical assets exist within the vicinity of the site which would allow servicing of the property should further residential development be undertaken.

Telecommunications

NBN servicing capabilities have been investigated and telecommunication assets exist within the vicinity of the site which would allow servicing of the property should further residential development be undertaken.

Sewer

Sewer servicing has been investigated and sewer infrastructure exists within the vicinity of the site which would be able to service the development. Any alterations or extensions to existing sewer infrastructure to service any further development of the property would be funded by the developer.

Roads

As discussed previously in this report, the property has frontage to Currawang Drive to the east, Dunns Road to the south, and Sunset Lane (a crown road reserve) to the west. It is noted that the Currawang Drive frontage would not be wide enough to support traffic to any proposed future subdivision development of the property.

Four potential subdivision layouts have been provided as Appendix G to this report which demonstrate access to the subdivision could be provided via alternative locations along the Dunns Road property frontage, or potentially via extension to Pimelea Place should Council prefer to approach and negotiate with neighbouring landowners to make this access available.

Given that the proposal would effectively complete the western extent of subdivision development within the suburb of Springvale, the potential access locations shown in the attached concept plans along the western property boundary would only be intended to service the proposed subdivision and would not be intended to support any further rezoning or subdivision of properties further west.

It is considered that access could be provided to any future subdivision of the property however the final location of this would need to be investigated further at future subdivision stage through engineering design based on the completed Dunns Road upgrade. It is noted that any road connections required to service any future subdivision development of the property would be funded by the developer.

Stormwater

Stormwater drainage infrastructure does not exist in the vicinity of the site due to the minimum lot sizes in the area. Stormwater would be disposed of onsite as any potential future lots would have a minimum size of 2Ha which would be sufficient for onsite stormwater disposal.

B2. Will the planning proposal give effect to a council's endorsed local strategic planning statement, or another endorsed local strategy or strategic plan?

Wagga Wagga City Council does not currently have a local strategic planning statement. The planning proposal is however consistent with the actions of the Wagga Wagga City Council Spatial Plan 2013/2043 as discussed previously on page 8 of this proposal.

B3. Is the planning proposal consistent with applicable State Environmental Planning policies?

Yes, the Planning proposal is consistent with applicable State Environmental Planning Policies as set out in Table 1 below.

Table 1 SEPPs applicable to the planning proposal

SEPP	Aims of Policy, if applicable	Consistent?	Assessment
SEPP 55 - Remediation of Land	The aims of this Policy are: (a) to promote the remediation of contaminated land for the purpose of reducing the risk of harm to human health or any other aspect of the environment by: (i) specifying when consent is required, and when it	Yes	The site is not identified in Council's Contaminated Land Register, nor are any adjoining sites. The property is zoned RU1 Primary Production and is currently, and has been historically, utilised for agricultural activities in the form of grazing. The potential contamination impacts of

	is not required, for a remediation work, and (ii) specifying certain considerations that are relevant in rezoning land and in determining development applications in general and development applications for consent to carry out a remediation work in particular, and (iii) requiring that a remediation work meet certain standards and notification requirements.		such a land use are low and there are no reasons to believe the site would be contaminated. Further to this, should the planning proposal be successful, any future Development Application for subdivision of the property could be accompanied by a Preliminary Site Investigation to confirm the site's suitability for further residential development.

B4. Is the planning proposal consistent with applicable Ministerial Directions (s. 9.1 directions)?

Yes, the Planning proposal is consistent with applicable Ministerial Directions as set out in Table 2 below.

Table 2 Ministerial Directions applicable to the planning proposal

s.9.1 Direction	Requirement	Consistent/ Inconsistent/ Justifiably inconsistent with direction
1 Employment and Resources		
1.2 Rural Zones	Agricultural value of rural land is to be protected.	**Justifiably Inconsistent**: The proposal seeks to rezone the land from RU1 Primary Production to R5 Large Lot Residential zone which will permit residential development. As discussed previously in this proposal, the site and those surrounding are identified on the Land and Soil Capability Mapping for NSW as being classified as Class 4, 5 and 7 being moderate to severe limitations, severe limitations and extremely severe limitations respectively. This means that the agricultural capability of the subject site and surrounding RU1 land is restricted to a reasonable extent and extensive agricultural use is likely to be unviable. Further to this, land to the east, part of the north and part of the southern boundary are zoned R5 Large Lot Residential with a lot size the same as, or less than, that proposed by this application. The proposal will facilitate further development of the site for large lot residential purposes which would be consistent with the existing R5 zoning and minimum lot size of surrounding R5 land while not detrimentally impacting on rural land which would be defined as having high production value.
1.5 Rural Lands	a) Agricultural production value of rural lands to be protected; b) The orderly and economic use and	**Justifiably Inconsistent:** The proposal seeks to rezone the site from RU1 Primary Production to R5 Large Lot Residential however the land is not considered to be prime agricultural land. As discussed previously in this proposal, the site and those surrounding are identified on the Land and Soil

	development of rural lands for rural and related purposes to be facilitated; c) The proper management, development and protection of rural lands to promote the social, economic and environmental welfare of the State to be assisted; d) The potential for land fragmentation and land use conflict in rural areas, particularly between residential and other rural land uses to be minimised; e) Sustainable land use practices and ensure ongoing viability of agriculture on rural land to be encouraged; and f) The delivery of the actions outlined in the NSW Right to Farm Policy to be supported.	Capability Mapping for NSW as being classified as Class 4, 5 and 7 being moderate to severe limitations, severe limitations and extremely severe limitations respectively. This means that the agricultural capability of the subject site and surrounding RU1 land is restricted to a reasonable extent and extensive agricultural use is likely to be unviable. Further to this, land to the east, part of the north and part of the southern boundary are zoned R5 Large Lot Residential with a lot size the same as, or less than, that proposed by this application. The proposal will facilitate further development of the site for large lot residential purposes which would be consistent with the existing R5 zoning and minimum lot size of surrounding R5 land while not detrimentally impacting on rural land which could be defined as having high production value. The proposal would not result in land fragmentation as land adjoining the site to the east and south are currently zoned R5. The proposal would not result in land use conflicts due to the minimum lot size sought by the proposal and the land capability of surrounding rural land, as previously discussed, would exclude extensive agricultural undertakings.
2 Environment and Heritage		
2.1 Environment Protection Zones	Environmentally sensitive areas should be protected and preserved.	**Consistent:** As described previously in this report, the land is identified as 'biodiversity', 'vulnerable land' 'water' and 'waterway' according to the WWLEP 2010. Due to the extent of terrestrial biodiversity identified on the site, NGH Consulting undertook a biodiversity assessment of the site. The assessment concluded that further development of the property could be sited and managed so as to preserve most of the native vegetation identified on the site, and therefore a significant impact to threatened species or ecological communities, or their habitats, is considered unlikely. NGH has also noted that depending on the favoured subdivision layout, the requirements of the Biodiversity Assessment Method may be triggered and offset obligations would be undertaken by the developer as required. In relation to the 'vulnerable land' identification, the site does not contain steep slopes or shallow soils which would restrict development. It is not subject to soil salinity or contain a high proportion of rock outcropping. In relation to the 'water' and 'waterway' identification of the site, as noted previously in this report the property contains a creek line. The property would be developed with the creek line taken into account and any further residential

		development of the site would be designed sited and managed to avoid any potential adverse impact on water quality, ecosystems and aquatic organisms.
2.3 Heritage Conservation	Items, areas, objects and places of environmental heritage significance and indigenous heritage significance must be conserved.	**Consistent:** The site is not identified in the WWLEP as containing any items, areas, objects or places of heritage significance. Further, an AHIMS search was carried out on 26th January 2020, attached as Appendix D to this proposal, which did not identify any sites or places of aboriginal heritage on the site or within a 1,000 metre buffer of its boundaries.
4 Hazard and Risk		
4.4 Planning for Bushfire Protection	a) Protect life, property and the environment from bush fire hazards by discouraging the establishment of incompatible land uses in bush fire prone areas; and b) Encourage sound management of bush fire prone areas.	**Consistent:** As discussed previously in this report, part of the site is identified as being located within the bushfire mapping buffer area. As such a bushfire assessment was undertaken by Southern Bushfire Solutions. The assessment is attached to this report as Appendix F. The assessment concluded that the proposed rezoning would be compatible with the bushfire hazard of the property given the proposed minimum lot size and the inclusion of appropriate APZs at development stage of the property. The recommendations within the report would be incorporated into any further development of the property should the planning proposal be successful.
5 Regional Planning		
5.10 Implementation of Regional Plans	To give legal effect to the vision, land use strategy, goals, directions and actions contained in Regional Plans.	**Consistent:** As discussed previously in this report, the proposal is consistent with the goals, directions and actions contained within the Riverina Murray Regional Plan 2036 specifically: Goal: Strong, connected and healthy communities • Direction 27: Manage rural residential development o Action 27.2: Locate new rural residential areas: ▪ in close proximity to existing urban settlements to maximise the efficient use of existing infrastructure and services, including roads, water, sewerage and waste services and social and community infrastructure; ▪ to avoid or minimise the potential for land use conflicts with productive, zoned agricultural land and natural resources; and ▪ to avoid areas of high environmental, cultural and heritage significance, important agricultural land or areas affected by natural hazards.

6 Local Plan Making		
6.1 Approval and Referral Requirements	LEP provisions should encourage the efficient assessment of development by not unnecessarily including provisions that require the concurrence of development applications to a Minister or public authority.	**Consistent:** The planning proposal does not include any such provisions.
6.3 Site Specific Provisions	Unnecessarily restrictive site specific planning controls are discouraged.	**Consistent:** The planning proposal does not propose any unnecessarily restrictive provisions.

Please note, Directions 1.1; 1.3; 1.4; 2.2; 2.4; 2.5; 3.1 – 3.7 inclusive; 4.1 – 4.3 inclusive; 5.1 to 5.9 inclusive; 5.11; 6.2 and 7.1 to 7.10 inclusive, are not applicable to the proposal.

SECTION C. ENVIRONMENTAL, SOCIAL AND ECONOMIC IMPACT

C1. IS THERE ANY LIKELIHOOD THAT CRITICAL HABITAT OR THREATENED SPECIES, POPULATIONS OR ECOLOGICAL COMMUNITIES, OR THEIR HABITATS, WILL BE ADVERSELY AFFECTED AS A RESULT OF THE PROPOSAL?

As discussed previously in this proposal, the site is identified as 'biodiversity', 'vulnerable land', 'water' and 'waterway' according to the WWLEP 2010. A biodiversity assessment was undertaken by NGH which concluded that further development of the property could be sited and managed so as to preserve most of the native vegetation identified on the site, and therefore a significant impact to threatened species or ecological communities, or their habitats, is considered unlikely. NGH has also noted that depending on the favoured subdivision layout, the requirements of the Biodiversity Assessment Method may be triggered and offset obligations would be undertaken by the developer as required.

C2. ARE THERE ANY OTHER LIKELY ENVIRONMENTAL EFFECTS AS A RESULT OF THE PLANNING PROPOSAL AND HOW ARE THEY PROPOSED TO BE MANAGED?

The planning proposal is not likely to result in any other environmental effects. Any potential environmental impacts of future subdivision development of the property would be assessed as part of a development application to Council should the planning proposal be successful.

C3. HAS THE PLANNING PROPOSAL ADEQUATELY ADDRESSED ANY SOCIAL AND ECONOMIC EFFECTS?

The economic and social effects of the Planning Proposal are considered to be positive for the Wagga Wagga LGA. The Planning Proposal would allow potential subdivision of the property which would lead to further housing options on the southern side of the city. The additional housing potential provided by the proposal would positively contribute to the local economy through the employment of local civil contractors at subdivision stage, and local building contractors during the residential development of each allotment. The proposal would also result in one off contributions to Council, as well as ongoing rates income for Council.

Socially, the proposal would contribute to the sustainable and cost effective use of existing infrastructure within the LGA, such as roads, local schools, emergency facilities, parks, and shopping centres and would assist in meeting the Wagga Wagga to 100,000 by 2038 campaign goals through provision of housing options for new residents.

SECTION D. STATE AND COMMONWEALTH INTERESTS

D1. IS THERE ADEQUATE PUBLIC INFRASTRUCTURE FOR THE PLANNING PROPOSAL?

As discussed previously in this report, the planning proposal would not immediately require additional public infrastructure. Any future development of the site following the planning proposal would include all necessary infrastructure provision to service the development.

D2. WHAT ARE THE VIEWS OF STATE AND COMMONWEALTH PUBLIC AUTHORITIES CONSULTED IN ACCORDANCE WITH THE GATEWAY DETERMINATION?

The views of the State and Commonwealth public authorities will not be known until after Gateway Determination, should it be forthcoming. The Gateway Determination would specify the public authorities requiring consultation, should there be any.

PART 4. MAPPING

The planning proposal would require amendment to the WWLEP 2010 Land Zoning and the WWLEP 2010 Minimum Lot Size Map.

PART 5. COMMUNITY CONSULTATION

The Gateway Determination, should it be forthcoming, will specify the community consultation that must be undertaken for the Planning Proposal. The consultation will be tailored to specific proposals generally on the basis of a 14 day exhibition period for low impact planning proposals and a 28 day exhibition period for all other planning proposals.

PART 6. PROJECT TIMELINE

Following lodgement of the planning proposal with Council, Council will develop a project timeline including reporting to Council, Gateway determination, public exhibition, reporting, Ministerial (or delegate) approval and implementation.

APPENDICES

APPENDIX A: LAND ZONING MAP – EXISTING AND PROPOSED

APPENDIX B: MINIMUM LOT SIZE MAP – EXISTING AND PROPOSED

APPENDIX C: INITIAL BIODIVERSITY ASSESSMENT PREPARED BY NGH CONSULTING

APPENDIX D: AHIMS SEARCH RESULTS

APPENDIX E: HYDROLOGY REPORT PREPARED BY MJM CONSULTING ENGINEERS

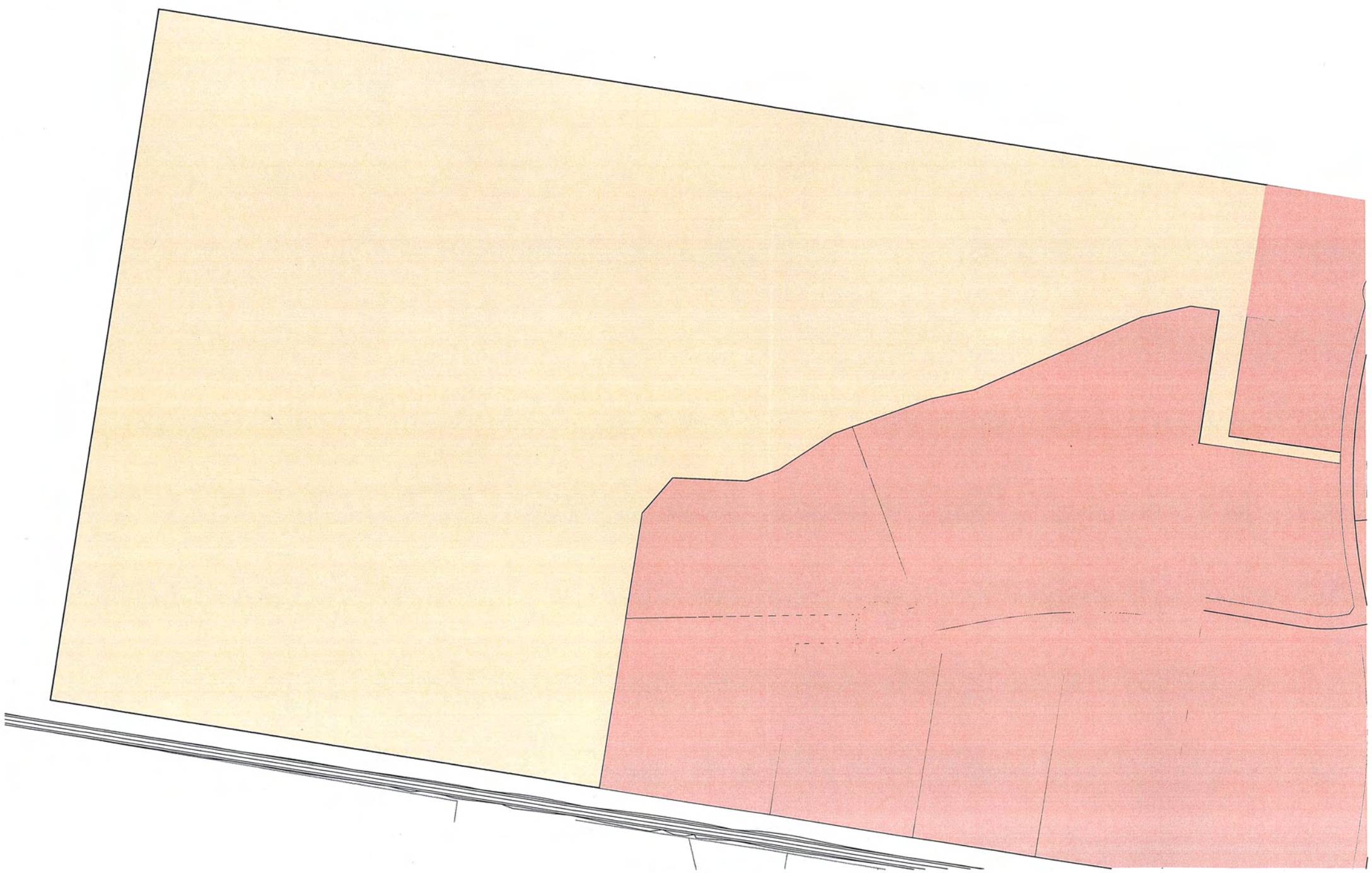
APPENDIX F: BUSHFIRE ASSESSMENT REPORT PREPARED BY SOUTHERN BUSHFIRE SOLUTIONS

APPENDIX G: POTENTIAL SUBDIVISION CONCEPT LAYOUT PLANS

APPENDIX H: 2012 PLANNING PROPOSAL COUNCIL REPORT

APPENDIX I: INITIAL ADVICE FROM RIVERINA WATER RE. SERVICEABILITY

Appendix A. Current & Proposed Zoning Plan



LEGEND

- R5 LARGE LOT RESIDENTIAL
- RU1 PRIMARY PRODUCTION

N
W E
S
NORTHPOINT

No.	DATE	AMENDMENTS	BY
A	01/05/2020	ISSUED FOR COMMENT	MJ

Filename: C_170514_Plan_02.dwg

PROJECT
PROPOSED SUBDIVISION
25 PEPPERMINT DRIVE
SPRINGVALE, NSW

SHEET SUBJECT
CURRENT ZONING PLAN

CLIENT

PROJECT NO.	SHEET NO.	ISSUE	DATE
170514	12	A	Apr 2020
COUNCIL REF.	SCALE		

DESIGNED	CHECKED	DRAWN	CHECKED
MM		MJ	

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ABN 16 107 158 350 ACN 107 158 350

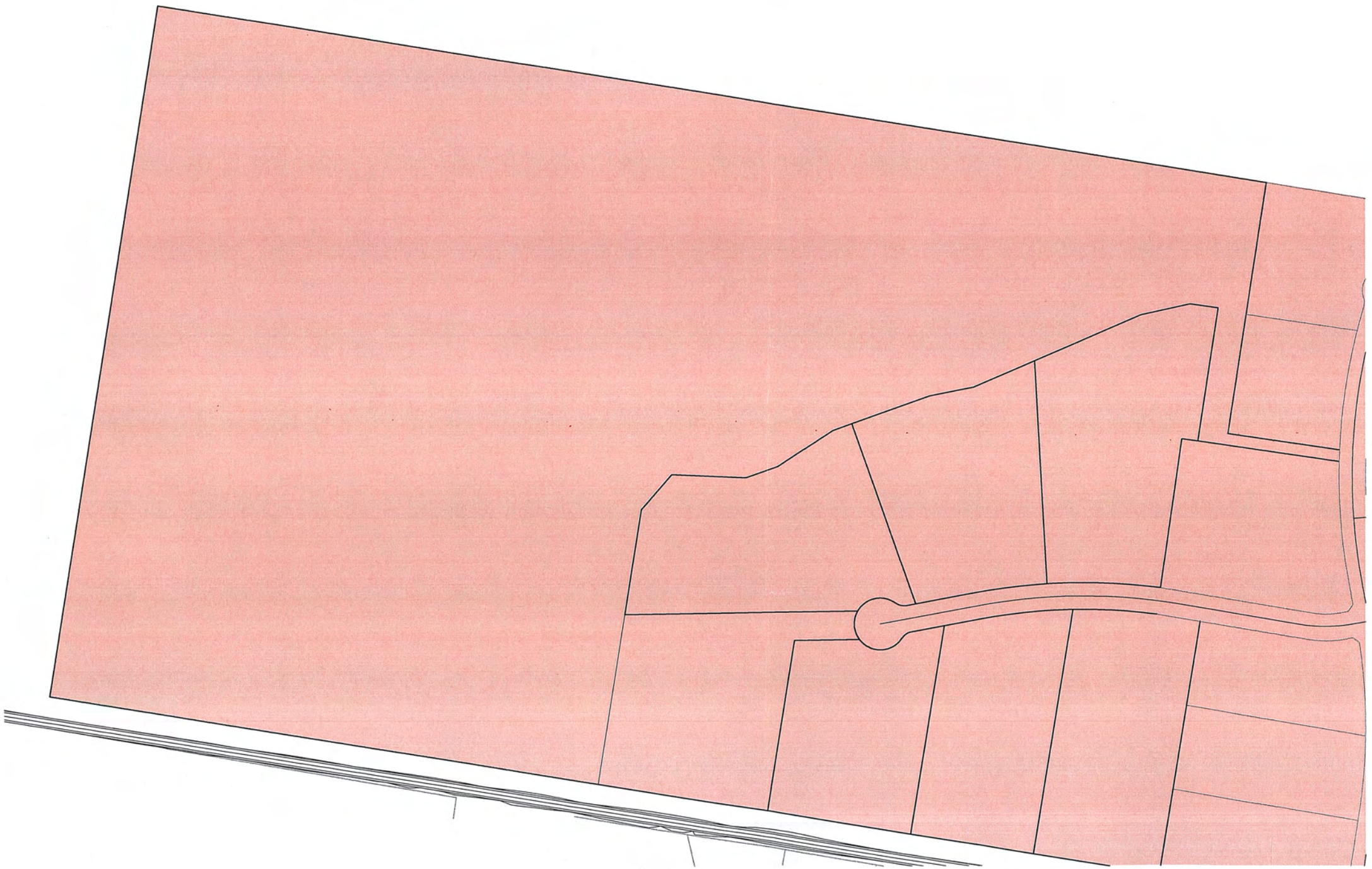
I HEREBY CERTIFY THAT ENGINEERING WORKS AS SHOWN ON THIS PLAN ARE WORK AS EXECUTED AND HAVE BEEN CONSTRUCTED GENERALLY IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS APPROVED BY THE DIRECTOR. IN ACCORDANCE WITH THE GENERAL REQUIREMENTS OF THE LOCAL COUNCIL

NAME: Michael J. McFeeters

SIGNATURE:

CAPACITY: Director

DATE:



LEGEND

R5 LARGE LOT RESIDENTIAL

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NORTHPOINT

No.	DATE	AMENDMENTS	BY
A	01/05/2020	ISSUED FOR COMMENT	MJ

Filename: C_170514_Plan_02.dwg

PROJECT
PROPOSED SUBDIVISION
25 PEPPERMINT DRIVE
SPRINGVALE, NSW

SHEET SUBJECT
PROPOSED ZONING PLAN

CLIENT

PROJECT NO.	SHEET NO.	ISSUE	DATE
170514	10	A	Apr 2020
COUNCIL REF.	SCALE		
DESIGNED CHECKED		DRAWN CHECKED	
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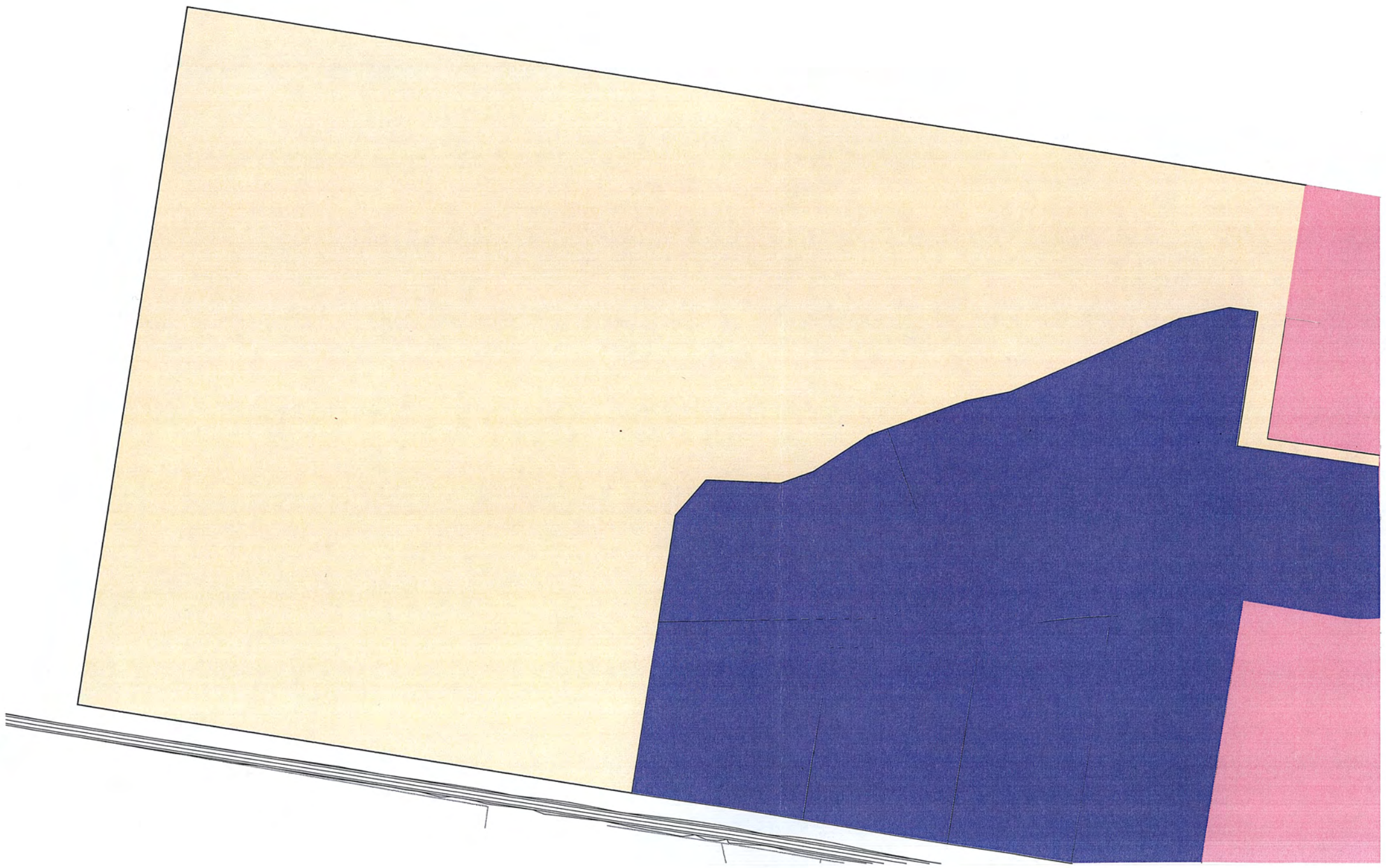
NAME: Michael J. McFeeters

SIGNATURE:

CAPACITY: Director

DATE:

Appendix B. Current and proposed minimum lot size plans



LEGEND

- MINIMUM 2 HA LOTS
- MINIMUM 8 HA LOTS
- MINIMUM 200 HA LOTS

N
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NORTHPOINT

No.	DATE	AMENDMENTS	BY
A	01/05/2020	ISSUED FOR COMMENT	MJ

Filename: C_170514_Plan_02.dwg

PROJECT
PROPOSED SUBDIVISION
25 PEPPERMINT DRIVE
SPRINGVALE, NSW

SHEET SUBJECT
CURRENT MINIMUM
LOT SIZE PLAN

CLIENT

PROJECT NO.	SHEET NO.	ISSUE	DATE
170514	11	A	Apr 2020
COUNCIL REF.	SCALE		
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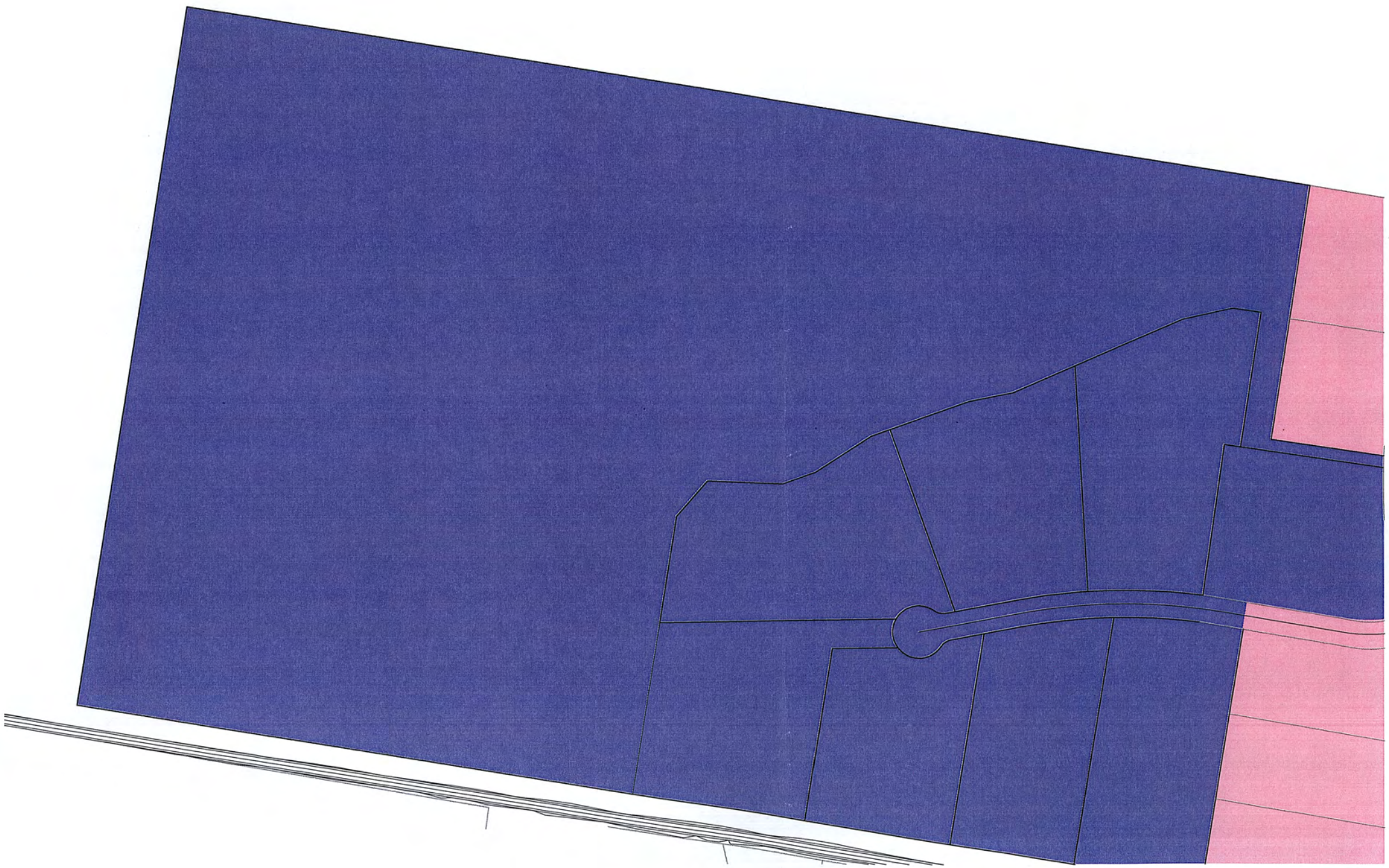

LEGEND

- MINIMUM 2 HA LOTS
- MINIMUM 8 HA LOTS

N
W E
S
NORTHPOINT

No.	DATE	AMENDMENTS	BY
A	01/05/2020	ISSUED FOR COMMENT	MJ

Filename: C_170514_Plan_02.dwg

PROJECT
PROPOSED SUBDIVISION
25 PEPPERMINT DRIVE
SPRINGVALE, NSW

SHEET SUBJECT
PROPOSED MINIMUM
LOT SIZE PLAN

CLIENT

PROJECT NO.	SHEET NO.	ISSUE	DATE
170514	9	A	Apr 2020
COUNCIL REF.	SCALE		

DESIGNED	CHECKED	DRAWN	CHECKED
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NAME: Michael J. McFeeters

SIGNATURE:

CAPACITY: Director

DATE:

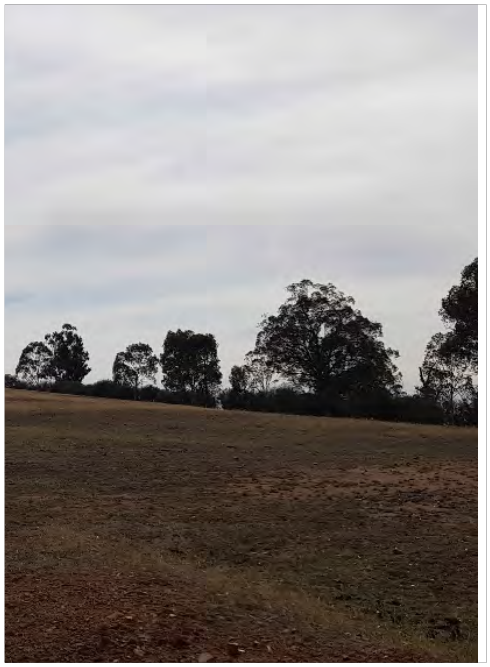
NGH

INITIAL BIODIVERSITY ASSESSMENT

Currawang Drive Planning Proposal

July 2020

Project Number: 20-029



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DOCUMENT VERIFICATION

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Revision	Date	Prepared by	Reviewed by	Approved by
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ACRONYMS AND ABBREVIATIONS

ASL	Above sea level
BAM	Biodiversity Assessment Method
BC Act	*Biodiversity Conservation Act 2016* (NSW)
BDAR	Biodiversity Development Assessment Report
Biosecurity Act	*Biosecurity Act 2015* (NSW)
BOM	Australian Bureau of Meteorology
BOS	Biodiversity Offsets Scheme
CEMP	Construction environmental management plan
Cwth	Commonwealth
DECCW	Refer to OEH
DoEE	(Cwth) Department of the Environment and Energy
DP&I	(NSW) Department of Planning and Infrastructure (now DPIE)
DPIE	(NSW) Department of Planning, Industry and Environment
EEC	Endangered ecological community – as defined under relevant law applying to the proposal
EIA	Environmental impact assessment
EPBC Act	(Cwth) *Environment Protection and Biodiversity Conservation Act 1999*
EP&A Act	(NSW) *Environmental Planning and Assessment Act 1979*
ESD	Ecologically Sustainable Development
FM Act	(NSW) *Fisheries Management Act 1994*
LGA	Local Government Area
ha	hectares
Heritage Act	(NSW) *Heritage Act 1977*
ISEPP	(NSW) *State Environmental Planning Policy (Infrastructure) 2007*
KFH	Key Fish Habitat

km	kilometres
LEP	Local Environment Plan
m	Metres
NES	Matters of National environmental significance under the EPBC Act (*c.f.*)
NPW Act	*National Parks and Wildlife Act 1974* (NSW)
NSW	New South Wales
OEH	(NSW) Office of Environment and Heritage, formerly Department of Environment, Climate Change and Water
REF	Review of Environmental Factors
REP	Regional Environmental Plan
SEPP	(NSW) State Environmental Planning Policy
SIS	Species Impact Statement
sp/spp	Species/multiple species

1. INTRODUCTION

1.1. BACKGROUND

MJM Consulting Engineers has prepared a Planning Proposal for the proposed rezoning of a parcel of land known as 39 Currawang Drive, Springvale (Lot 21 DP1218487). The land is intended to be rezoned from RU1 Primary Production to R5 Large Lot Residential.

Part of the land was previously included in the Wagga Wagga Biodiversity Certification Order 2010. This status has been amended by the OEH 2017 Order in respect of the Wagga Wagga Local Environmental Plan, which had the effect of limiting the provisions of the certification to exclude land within Rural and Environmental zones. The entire of Lot 21 is zoned RU1 and therefore is no longer considered biodiversity certified land under Part 8 of the *Biodiversity Conservation Act 2016* (BC Act).

For the purpose of this assessment the proposal area is defined by the entire area of Lot 21 DP1218487.

1.2. PROJECT DESCRIPTION

The proposal is located in western NSW in the locality of Springvale. It falls within the City of Wagga Wagga Local Government Area (LGA). A map of the proposal location is shown in Figure 1-1.

MJM Consulting Engineers has prepared a Planning Proposal for the proposed rezoning of a parcel of land known as 39 Currawang Drive, Springvale (Lot 21 DP1218487). The land is intended to be rezoned from RU1 Primary Production to R5 Large Lot Residential.

Should the Planning Proposal proceed, and the land be rezoned, MJM Consulting Engineers would submit a Development Application to Wagga Wagga City Council (WWCC) for the proposed subdivision of the land. The proponent intends to subdivide the land for large residential lots, as indicated by the Concept Plan (Figure 5-1). Lots would range from approximately 2 hectares to 3 hectares.

The DA would be assessed and determined under Part 4 of the *Environmental Planning & Assessment Act* 1979 (EP&A Act) and the BC Act 2016.

1.3. SCOPE OF THE REPORT

NGH has proposed a site and proposal-specific approach based on our knowledge of the area and complexity of the proposed rezoning. The report would assist the relevant authority for the planning proposal to determine how the rezoning could be supported and biodiversity values maintained.

This Initial Biodiversity Assessment has been prepared to consider:

- The relevant requirements of the *BC Act* the *Environment Protection and Biodiversity Conservation Act 1999 (*EPBC Act).
- The nature, extent and condition of the flora and fauna at the site,
- The likelihood of any threatened species, communities and populations being present,
- The Biodiversity Offset Scheme (BOS) thresholds assessment,
- Any threatened biota to which a significant effect could occur and propose design or ongoing management measures that could mitigate this.

For the purpose of this report:

Proposal Area: All land within Lot 21 DP1218487.

Development footprint: Area of land directly impacted by the proposal, including the proposal area.

Study Area: Encompasses the proposal area as well as all areas surveyed for the purposes of this assessment.

Locality: The area within a 10 km radius of the development footprint.

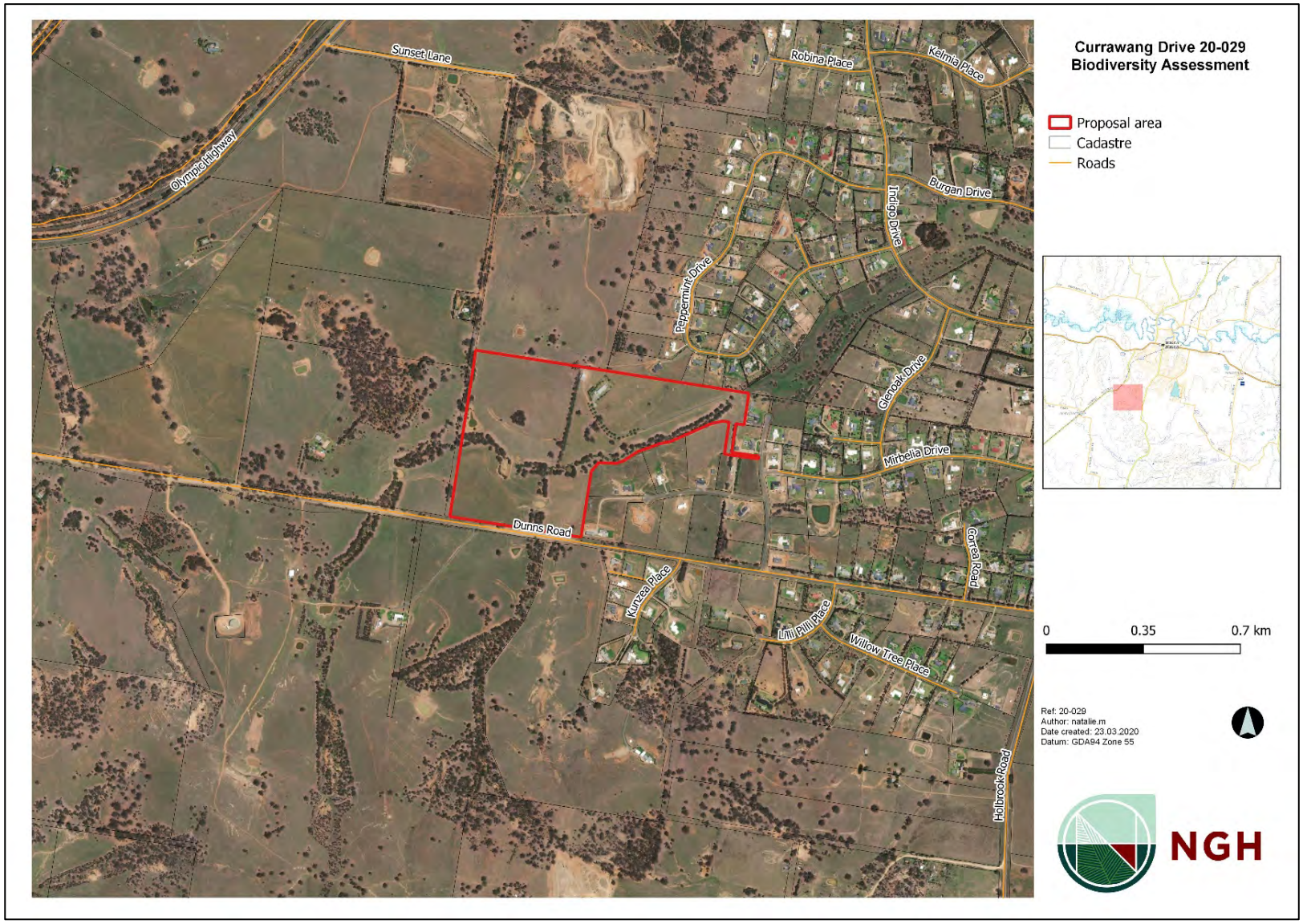

Figure 1-1 Proposal Location

2. STATUTORY CONSIDERATIONS

2.1. NSW ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

The *Environmental Planning & Assessment Act 1979* (EP&A Act) provides the framework for the assessment of development activities.

MJM Consulting Engineers has prepared a Planning Proposal for the proposed rezoning of a parcel of land known as 39 Currawang Drive, Springvale (Lot 21 DP1218487). The land is intended to be rezoned from RU1 Primary Production to R5 Large Lot Residential. The Planning Proposal would be assessed under Part 3 Division 3.4 of the EP&A Act.

Should the Planning Proposal proceed, and the land be rezoned, it is understood MJM Consulting Engineers would submit a Development Application to Wagga Wagga City Council for the proposed subdivision of the land. The proposal would be assessed and determined under Part 4 of the EP&A Act.

2.2. NSW BIODIVERSITY CONSERVATION ACT 2016

The BC Act aims to maintain a healthy, productive and resilient environment for the greatest well-being of the community, now and into the future, consistent with the principles of ecologically sustainable development. The BC Act contains lists of critically endangered, endangered, and vulnerable species, populations and ecological communities, as well as a list of key threatening processes in NSW.

The primary requirement under the BC Act, is to determine whether a development is likely to significantly affect threatened species. According to clause 7.7(2) of the BC Act, if a proposed development is likely to significantly affect threatened species, the development application is to be accompanied by a biodiversity development assessment report (BDAR). According to this clause, development is considered likely to significantly affect threatened species if:

> ***(a) it is likely to significantly affect threatened species or ecological communities, or their habitats, according to the test in section 7.3 (5-part Test) or***
>
> ***(b) the development exceeds the biodiversity offsets scheme threshold if the biodiversity offsets scheme applies to the impacts of the development on biodiversity values, or***
>
> ***(c) it is carried out in a declared area of outstanding biodiversity value.***

This assessment considers the potential for the future subdivision proposal to significantly affect threatened species.

2.3. CWTH ENVIRONMENTAL PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999

The EPBC Act protects nationally and internationally important flora, fauna, ecological communities and heritage places, which are defined in the EPBC Act as matters of national environmental significance. Matters of national environmental significance relevant to biodiversity are:

- Wetlands of international importance.
- Nationally threatened species and ecological communities.
- Migratory species.
- Commonwealth marine areas.

Significance of impacts is determined in accordance with the Significance impact guidelines 1.1 – matters of national environmental significance (DoE 2013).

Where a proposal is likely to have a significant impact on a matter of national environmental significance, the proposal is referred to the Commonwealth Environment Minister via the Department of the Environment (DoE). The Minister then determines whether the proposal is a 'controlled action'. If a proposal is declared a controlled action, an assessment of the action is carried out and the Minister makes a decision to approve, approve with conditions, or not approve the proposed action.

This assessment considers the potential for the future subdivision proposal to impact on matters of national environmental significance relevant to biodiversity.

3. METHODOLOGY

3.1. BACKGROUND REVIEW

3.1.1. Database searches

Background searches were undertaken prior to carrying out field investigations to determine whether any threatened flora or fauna species, communities or populations were likely to occur in the study area. These background searches are listed in Table 3-1. The results of the database searches are shown in Appendix A.

Table 3-1 Background Searches undertaken for the proposal

Resource	*Target*	*Search date NGH*	*Search area*
NSW Office of Environment and Heritage (OEH) Wildlife Atlas Database	Threatened flora and fauna, populations and endangered ecological communities	17/02/2020	10 km buffer around the proposal area
NSW Office of Environment and Heritage Threatened Species regional and habitat search	Threatened flora and fauna, populations and endangered ecological communities	17/02/2020	NSW South Western Slopes, Inlands Slopes Subregion
EPBC Act Protected Matters Search	Threatened flora and fauna, endangered populations and ecological communities and migratory species	17/02/2020	10 km buffer around the proposal area
OEH Vegetation Information System	Plant Community Type (PCT) Descriptions	12/02/2020	Study Area
Department of Primary Industries (DPI) Weedwise database	Priority weeds declared in the relevant LGAs.	12/02/2020	Wagga Wagga City Council

3.1.2. Literature review

Documentation and literature relevant to this assessment was reviewed, including:

- NSW OEH Threatened Species Profiles.
- Department of Environment and Energy (DEE) EPBC Act Species Profiles and Threats Database (SPRAT).
- Construction Methodology and concept designs from Proponent.
- NSW OEH Vegetation Information System (VIS) Map Catalogue.
- BioNet Vegetation Classification Database.
- Threatened Species Biodiversity Survey and Assessment: Guidelines for Developments and Activities (Working Draft) (DEC 2004).
- NSW WeedWise database (NSW DPI, 2018).
- Satellite imagery.

3.2. FIELD SURVEY

3.2.1. Survey timing and conditions

A site survey was completed on 21 February 2020 by two ecologists from NGH. Weather recorded at Springvale (Nangus Road, the nearest Bureau of Meteorology station) for the day is shown in Table 3-2.

Table 3-2 Weather conditions during February survey in 2020

Dates	*Temperature (min ^{o}C)*	*Temperature (max ^{o}C)*	*Rainfall (mm)*	*Wind speed (9am km/h)*
21 February 2020	15.6	28	2.0	Moderate

3.2.2. Flora survey methods

The aims of the flora surveys were to:

- Determine the vegetation communities present within the study area, their condition and extent.
- Identify potential Threatened Ecological Communities (TECs) within the study area and determine their condition and extent.
- Identify potential habitat for threatened flora species within the study area.

The study area was surveyed using the 'random meander' method, as documented by Cropper (1993). Species were recorded progressively with abundance recorded within proposal area. Any priority weeds were recorded opportunistically. Based on existing vegetation mapping (OEH_VIS_ID 4469) and the field survey, vegetation in the proposal area was assigned to a Plant Community Type (PCT) in accordance with the Vegetation Information System Classification Database (OEH). No threatened species targeted surveys were conducted.

3.2.3. Fauna survey methods

The aims of the terrestrial fauna surveys were to:

- Assess the fauna habitat types available and their quality and suitability as threatened species habitat (e.g. trees with hollows, ground cover, vegetation structural complexity).

Opportunistic fauna sightings were also recorded during the site visit. No threatened species targeted surveys were conducted.

3.2.4. Limitations

The survey undertaken involved an initial site assessment to determine Plant Community Types (PCTs) and key fauna habitat present on site for the purpose of preparing an Initial Biodiversity Assessment, as outlined in Section 1.3 of this report.

There is potential for some flora species to have not been recorded during the survey due to the timing of the survey and the below average monthly rainfall. Some ephemeral or short-lived species such as grasses, orchids and lilies, have a limited growing season and tend to grow during spring and early summer during favourable conditions.

Site surveys were conducted during the mid-morning and some fauna species may not have been present during this time of the day. Opportunistic fauna surveys were undertaken. No targeted fauna surveys were conducted, and assessment of fauna is based on habitat features present.

4. RESULTS

4.1. FAUNA

Seven fauna species were recorded during the field survey. A complete fauna species list is provided in Appendix B. No threatened fauna species were recorded during the surveys.

4.2. FLORA

The vegetation within the study area comprises patches of River Red Gum (*Eucalyptus camaldulensis*), Red box (*Eucalyptus polyanthemos*), Grey Box (*Eucalyptus microcarpa*), Blakely's Red Gum (*Eucalyptus blakelyi*), White Cypress Pine (*Callitris galucophylla*), Lemon-scented Gum (*Corymbia citriodora*) and Yellow Box (*Eucalyptus melliodora*). The understory species within the study area are sparse, and groundcover is dominated by exotic vegetation. Exotic annual grasses including Barley Grass *(*Hordeum leporinum*), Dandelion (**Taraxacum officinale*), Ryegrass (**Lolium spp.*) and Lovegrass (**Eragrostis spp*) were common in the understory.

A total of 31 flora species were recorded during the site surveys, comprising 15 native and 17 exotic species. No threatened species were observed during the flora surveys. A complete list of all species recorded is provided in Appendix B.

4.3. PLANT COMMUNITY TYPES

Two Plant Community Types were identified in the study area:

- PCT 277 Blakely's Red Gum – Yellow box Grassy Tall Woodland of the NSW south western slopes bioregion.
- PCT 5 River Red Gum shrub/grass - Riparian tall woodland or open forest wetland mainly in the upper slopes sub-region of the NSW South Western Slopes bioregion and western South East Highlands Bioregion.

The condition and extent of these PCTs are described in Table 4-1. The location of the vegetation community within the proposal area are mapped in Figure 4-1.

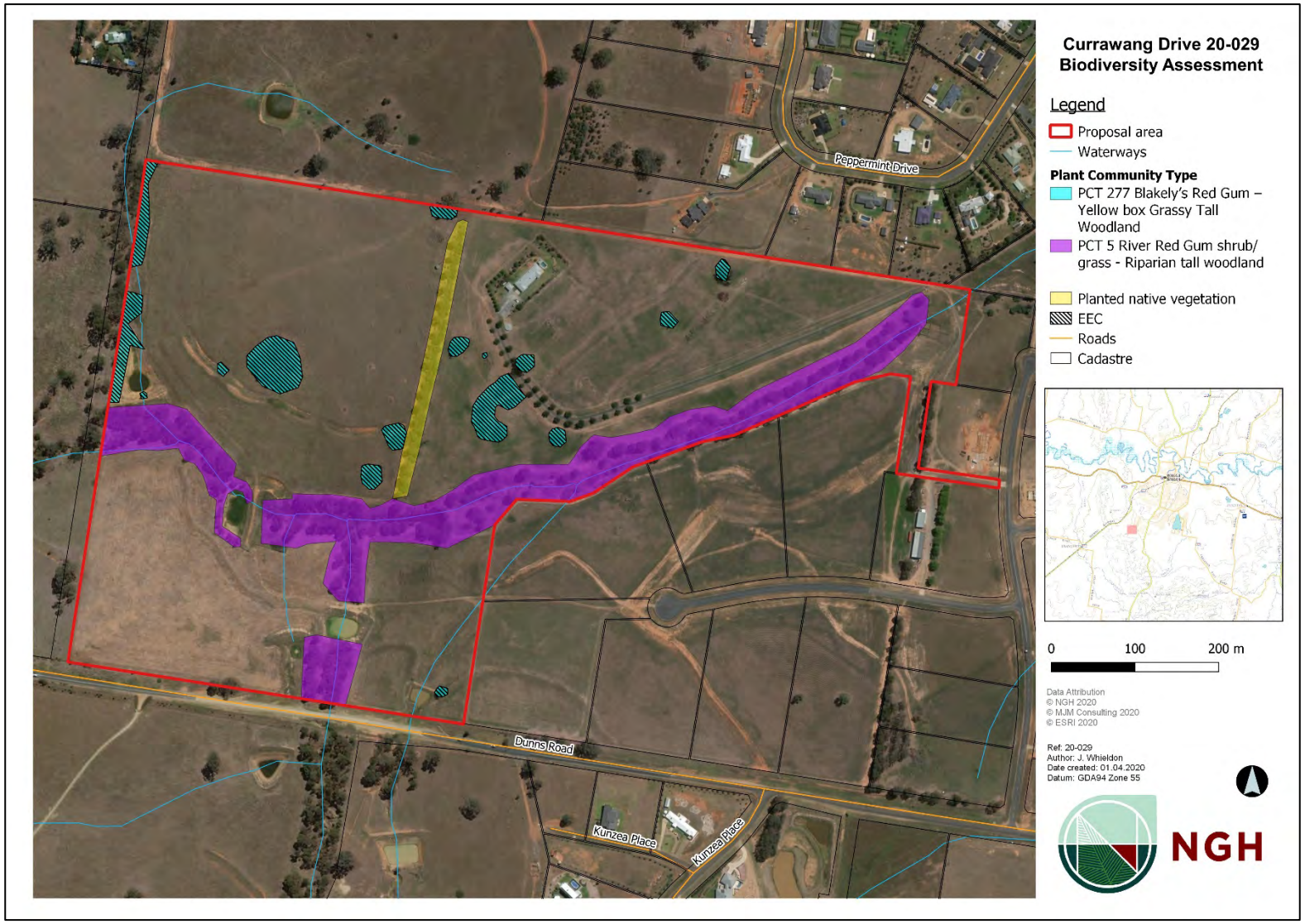

Figure 4-1 Plant Community Types within the study area.

Table 4-1 Description of PCTs within proposal area.

Blakelys Red Gum – Yellow box Grassy Tall Woodland of the NSW south western slopes bioregion. (PCT277)	
Vegetation Formation	Open dry tall grassy woodland
Vegetation Class	Open Grassy Woodland
Description	This vegetation community within the study area is an open woodland lacking any mid storey shrubs. Understory species were sparse and were dominated by exotic species including Barley Grass (**Hordeum leporinum*), Ryegrass (**Lolium spp*.), Common Sowthistle (**Sonchus oleraceus*), Goosegrass (**Galium aparine),* Soft Brome (**Bromus hordeaceus*), Wild Oats (**Avena fatua*), and Lovegrass (**Eragrostis spp*).
Approximate extent within study area	This vegetation community covers approximately 1.38 ha of the 40.62 ha proposal area.
Condition	Low - Moderate
Conservation Status	This vegetation community forms of the NSW Threatened ecological community (TEC) *White Box Yellow Box Blakely's Red Gum Woodland* (Box Gum Woodland). This community is listed as an Endangered Ecological Community (EEC) under the *Biodiversity Conservation Act 2016*. The vegetation is does not conform to the Commonwealth listed *White Box Yellow Box Blakely's Red Gum Grassy Woodland and Derived Native Grassland* under the EPBC Act, due to the ground layer containing less than 50 % of native perennial species.
Image	 Figure 4-2 Example of PCT 277

River Red Gum herbaceous-grassy very tall open forest wetland on inner floodplains in the lower slopes sub-region of the NSW South Western Slopes Bioregion and the eastern Riverina Bioregion. (PCT5)	
Vegetation Formation	Forested Wetlands
Vegetation Class	Eastern Riverine Forests
Description	This vegetation community within the study area is an open woodland lacking any mid storey shrubs. Understory species were sparse and were dominated by exotic species including Barley Grass (**Hordeum leporinum*), Ryegrass (**Lolium spp*.), Common Sowthistle (**Sonchus oleraceus*), Goosegrass (**Galium aparine*), Soft Brome (**Bromus hordeaceus*), Wild Oats (**Avena fatua*), and Lovegrass (**Eragrostis spp*).
Approximate extent within study area	This vegetation community covers approximately 5.73 ha of 40.62 ha of the proposal area.
Condition	Moderate
Conservation Status	This vegetation community does not form part of an threatened ecological community under the BC or EPBC Acts.
Image	 Figure 4-3 Example of PCT 5

4.3.1. Exotic vegetation

The study area has been highly disturbed (cropping and cattle grazing) therefore a prevalence of exotic vegetation was found during the site surveys. Barley Grass *(*Hordeum leporinum*), Ryegrass (**Lolium spp.*) and Lovegrass (**Eragrostis spp*) were noted as a component of all vegetation communities. The cleared paddocks and understory of woodland vegetation were dominated by these exotic species (Figure 4-4).

Figure 4-4 Example of exotic vegetation in the proposal area.

4.3.2. Planted Vegetation

A row of planted native vegetation occurs in the centre of the proposal area. This vegetation is dominated by Lemon Scented Gum (*Corymbia citriodora)* (Figure 4-5). 0.64 ha of planted vegetation occurs within the proposal area.

Figure 4-5 Example of planted vegetation within the proposal area.

4.4. THREATENED SPECIES

4.4.1. Threatened ecological communities

One TEC was identified in the proposal area:

- White Box Yellow Box Blakely's Red Gum Woodland (Box Gum Woodland) – EEC under the NSW BC Act

4.4.2. Endangered populations

No endangered populations are recorded within the proposal area. The nearest population, Squirrel Glider, is recorded about 2 km from the proposal area. Based on the habitat evaluation in Appendix C the Squirrel glider was considered unlikley to occur in the proposal area.

4.4.3. Listed threatened fauna species

The Atlas of NSW Wildlife database search found 14 threatened flora species known from within a 10km radius of the proposal site:

- Little Eagle (*Hieraaetus morphnoides*).
- Swift Parrot (*Lathamus discolour*).
- Turquoise Parrot (*Neophema pulchella*).
- Superb Parrot (*Polytelis swainsonii*).
- Brown Treecreeper (*Climacteris picumnus victoriae*).
- Grey-crowned Babbler (*Pomatostomus temporalis temporalis*).
- Dusky Woodswallow (*Artamus cyanopterus syanopterus*).
- Koala (*Phascolarctos cinereus*).
- Squirrel Glider (*Petaurus norfolcensis*).

A threatened species profile search was also undertaken indicating 73 threatened fauna species could potentially occur within the locality (Appendix A).

A habitat evaluation was undertaken for these species (Appendix C). Based on this assessment, 28 of these species were identified as having the potential to occur or utilise habitat in the study area.

4.4.4. Listed threatened flora species

The Atlas of NSW Wildlife database search indicated there were no threatened flora species known from within a 10km radius of the proposal area.

A threatened species profile search was also undertaken indicating 37 threatened flora species could potentially occur within the locality (Appendix A).

A habitat evaluation was undertaken for these species (Appendix C). Based on this assessment, 5 of these species were identified as having the potential to occur in the study area.

4.4.5. Fauna habitat

The proposal area supports foraging habitat for grassland and open woodland fauna species. In general, the fauna habitat quality within the study area is considered to be moderate. Habitat features include juvenile non hollow bearing trees, mature hollow bearing trees,shrubs and open exotic grassland for foraging. Fallen timber is limited and there are no partially bedded rocks or rocky outcrops. The landscape has a history of disturbance from clearing vegetation for livestock.

4.5. EPBC MATTERS OF NATIONAL SIGNIFICANCE

An EPBC Act protected matters search indicated that 3 Threatened Ecological Communities, 8 threatened flora, 8 threatened birds species, 3 threatened fish species, 2 threatened frog, 5 threatened mammal species, 1 insect, 2 reptiles and11 migratory species could potentially occur within the locality (Appendix A).

A habitat evaluation was undertaken for these species (Appendix C). Based on this assessment, none of these species were identified as having the potential to occur or be impacted by the proposal. This is due to the development site being previously disturbed and dominated by exotic vegetation. The proposal would have only limited vegetation clearing including no removal of hollow bearing trees.

4.5.1. Threatened Ecological Communities

One TEC was identified in the proposal area:

- White Box Yellow Box Blakely's Red Gum Grassy Woodland and Derived Native Grassland (Box Gum Woodland) – EEC under the EPBC Act

The community does not conform to the EPBC Listed community due to the ground layer containing less than 50 % of native perennial species.

4.5.2. Threatened Flora Species

Based on the habitat assessment (Appendix C) two flora species listed under the EPBC Act were identified as having the potential to occur or be impacted by the proposal.

4.5.3. Threatened Fauna Species

Based on the habitat assessment (Appendix C) seven of the fauna species listed under the EPBC Act were identified as having the potential to occur or be impacted by the proposal.

5. PREDICTED IMPACTS

5.1. VEGETATION LOSS

Dependent on further assessments and final design, the potential future subdivision could have a direct impact on vegetation communities and fauna habitat in the proposal area. Preliminary design concepts (Figure 5-1 and Figure 5-2) provided by MJM Consulting Engineers indicate there may be opportunity to preserve most of the native vegetation within the proposal area.

It is understood through MJM Consulting Engineers that WWCC may not support the intended access onto Sunset Lane. Accordingly, MJM has developed several alternative design concepts in support of the planning proposal to be considered by Council and DPIE. NGH has reviewed three alternative design concepts (Concept E, F and G) provided by MJM Consulting Engineers. Concept G (Figure 5-2) would likely involve the largest area of native vegetation clearing and is assessed in Table 5-1.

The original design (Figure 5-1) concept would require the least clearing of native vegetation. Dependent on further assessments and final design, between 0.38 ha and 0.64 ha of native vegetation may be impacted by infrastructure required for the proposal (Table 5-1). For the purpose of this initial assessment, the impact area includes areas used for construction of the road, utilities, future building envelopes and anticipated boundary fencing. A 2 m wide impact are has been included for boundary fence clearing. Detailed design plans would be required to determine the full extent of impacts to native vegetation. This should include provisions to protect retained vegetation. A detailed impact assessment would be prepared to support a future DA.

Areas not mapped in Figure 5-1 as a PCT type are considered non-native vegetation at this stage. Any native grasses that may be present should be surveyed during the relevant seasonal period with the further detailed assessment to be conducted at DA stage. These areas would be defined through the completion of a Land Category Assessment in accordance with the *Local Land Services Act 2013.* These areas are not included in the calculations below and would require further assessment as part of the DA.

Table 5-1 Potential impact to native vegetation communities from the proposal

Native Vegetation Community	Condition	Area within Proposal Area (ha)	Potential area to be removed – original design (ha)	Potential area to be removed – option G (ha)
PCT 5 River Red Gum herbaceous-grassy very tall open forest wetland on inner floodplains in the lower slopes sub-region of the NSW South Western Slopes Bioregion and the eastern Riverina Bioregion.	Moderate	5.73	0.17	0.30
PCT 277 Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	Low-Moderate	1.38	0.16	0.29
Planted Native Vegetation	Low-Moderate	0.64	0.05	0.05
	Total	**7.75**	**0.38**	**0.64**

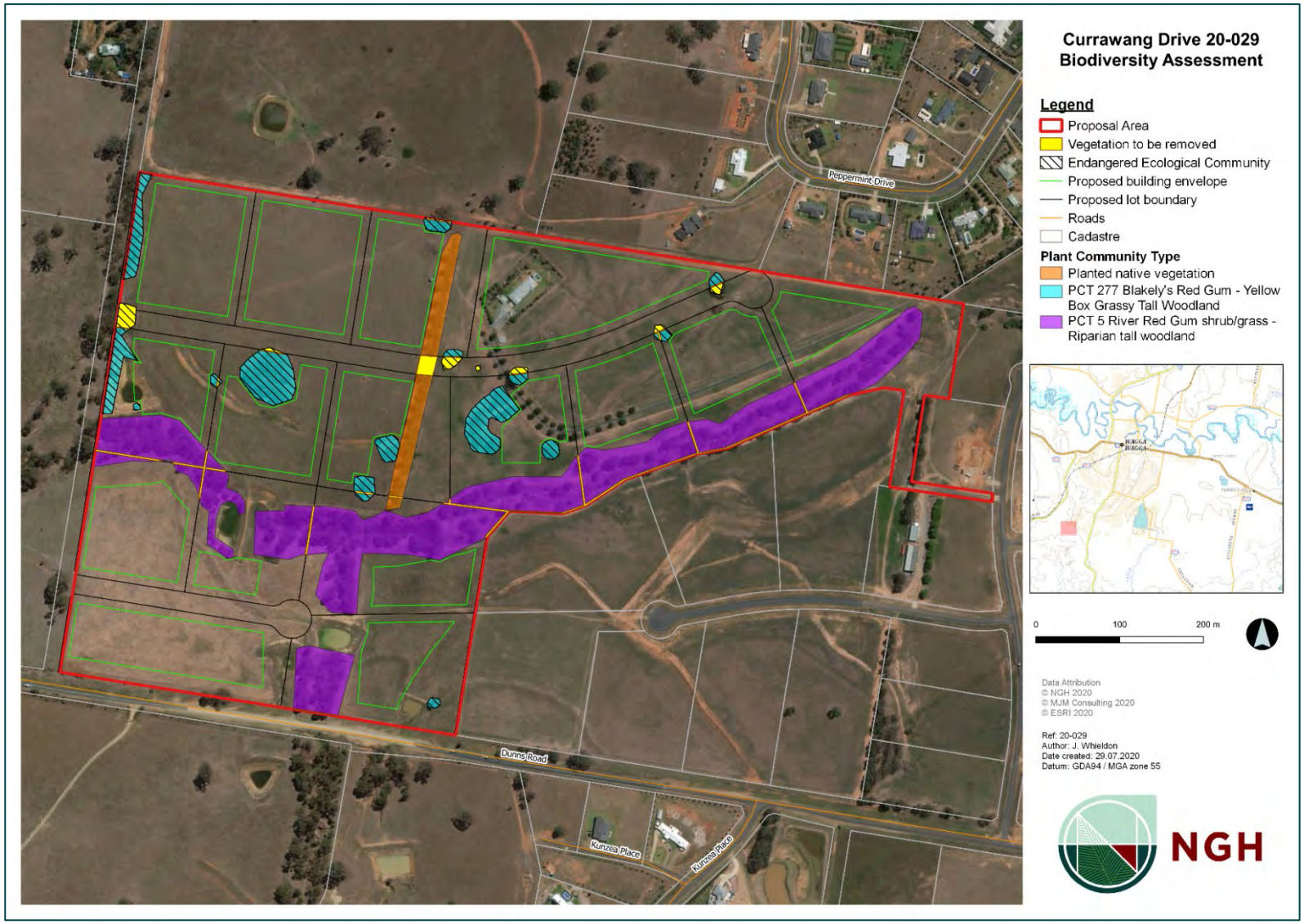

Figure 5-1 Vegetation loss (original design). Areas not mapped as a PCT type are considered non-native vegetation.

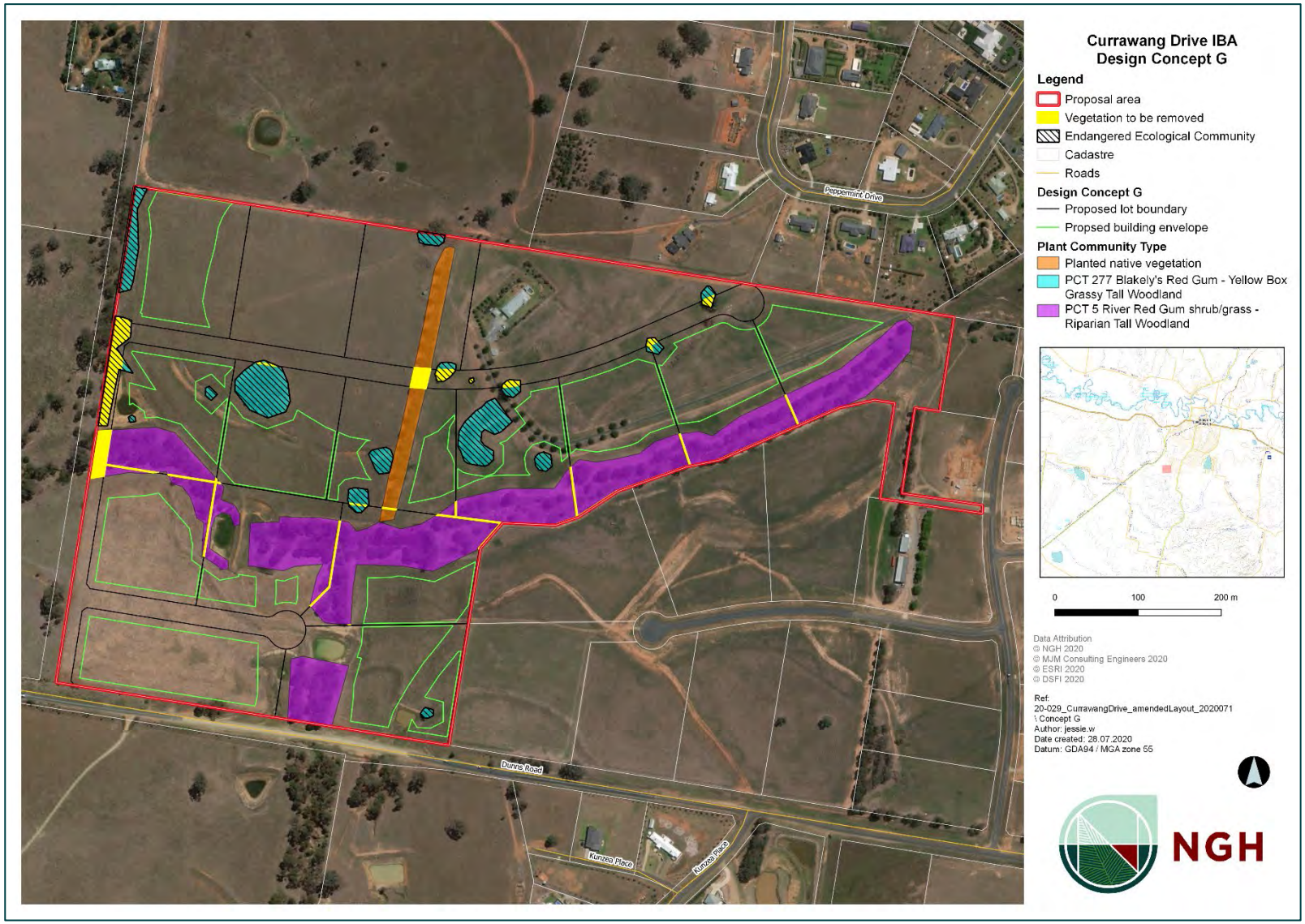

Figure 5-2 Vegetation loss (Concept G). Areas not mapped as a PCT type are considered non-native vegetation.

5.2. THREATENED ECOLOGICAL COMMUNITIES

Dependent on further assessments and final design, the proposal may disturb up to 0.29 ha of low - moderate condition Box Gum Woodland EEC (PCT 277 *Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion*). The majority of this EEC has been disturbed and modified by previous agricultural activities which has led to the spread of exotic species within the understorey. The proposal would avoid impacts to native vegetation where practicable, however some removal of mature and juvenile Eucalypts would likely be required for the provision of infrastructure.

5.3. THREATENED FLORA SPECIES

No threatened flora species were recorded during the field surveys. Four species were identified as potentially occurring in the proposal area. Given the species were not identified during the field survey and the limited clearing of habitat required within the study area, a significant impact to threatened flora species listed under the BC Act or EPBC Act is considered unlikely.

5.4. LOSS OF FAUNA HABITAT

The vegetation within the proposal area provides nesting/roosting and foraging habitat for a number of fauna species. The fauna habitat quality within the proposal area is moderate, given the area has a water body on site and the presence of hollow bearing trees.

Dependent on further assessments and final design, the proposal may disturb up to 0.64 ha of native vegetation. The future proposal has been designed to avoid impacts to native vegetation and habitat. Minimal tree clearing would occur, and no disturbance to aquatic habitat would occur. Most habitat including hollow bearing trees would be left undisturbed. The habitat to be removed is not considered to impact the long-term survival of identified threatened fauna species in the locality.

5.5. THREATENED FAUNA SPECIES

No threatened fauna species were observed during the site survey. Threatened species have been assessed via a threatened species evaluation (Appendix C). Species were assessed based on the presence of suitable habitat with the study area. 28 fauna species were assessed as having potential to occur in or utilise habitat with the proposal area.

No significant impact on these species is considered likely to occur due to the limited vegetation clearing, based on the preliminary design provided (0.64 ha), and avoidance of hollow bearing trees.

6. BIODIVERSITY CONSERVATION ACT THRESHOLDS

A summary of the potential impacts from the proposal against the BC Act thresholds is provided in Table 6-1.

According to the provisions of the BC Act, a subdivision assessment must also account for any *future* clearing necessary to enable the future development of the lots.

Table 6-1 Impact assessment against the BC Act Thresholds.

<table>
<tr><th>Threshold</th><th>Application to the Proposal</th><th>Threshold Exceeded ?</th></tr>
<tr><td>The development is likely to significantly affect threatened species, populations or ecological communities (clause 7.2(1)(a))</td><td>No significant effects on threatened species, populations or ecological communities is considered likely, based on the preliminary design concept (refer to Section 5.2). However, post detailed design an impact assessment at the DA stage is required to confirm this.</td><td>No</td></tr>
<tr><td colspan="3">The development exceeds the biodiversity offsets scheme threshold (clause 7.2(1)(b))
Note; there are two potential BOS thresholds, pursuant to clause 7.1(1) of the BC Regulation.</td></tr>
<tr><td><table><tr><th>Minimum lot size associated with the property</th><th>Threshold for clearing of native vegetation</th></tr><tr><td>1 ha to less than 40 ha</td><td>0.5 ha or more</td></tr></table></td><td>The proponent intends to reduce the minimum lot size of the land to 2 hectares, through the planning proposal.

In that instance, the clearing threshold would be 0.5 ha of native vegetation.

Based on the preliminary design concepts provided, between 0.38 ha and 0.64 ha of native vegetation could potentially be cleared for the purpose of infrastructure (roads, utilities, boundary fences and building envelopes).

Should native vegetation clearing exceed 0.5 ha, a BDAR would be required.

Any additional clearing of native vegetation identified in detailed design needs to be considered to ensure the cumulative impact does not exceed 0.5 ha and trigger the BOS.</td><td>No</td></tr>
<tr><td>The clearing of native vegetation, or other action prescribed by clause 6.1, on land identified on the Biodiversity Values map;</td><td>The land is not identified on the Biodiversity Values map.</td><td>No</td></tr>
<tr><td>The development is in an area of Outstanding Biodiversity Value (clause 7.2(1)(c))</td><td>None occur in the proposal area.</td><td>No</td></tr>
</table>

According to clause 7.7(2) of the BC Act, if a proposed development is likely to significantly affect threatened species, the development application is to be accompanied by a Biodiversity Development Assessment Report (BDAR).

The preliminary design concept (Figure 5-1) provided by MJM Consulting Engineers indicates that up to 0.38 ha of native vegetation may be cleared as a result of the proposal. This includes 0.16 ha of PCT 277, 0.17 ha of PCT 5 and 0.05 of planted native vegetation. Based on this concept, the future subdivision could potentially avoid triggering the BC Act thresholds, as outlined in Section 5.

The alternative design concept (Figure 5-2) provided by MJM Consulting Engineers indicates that up to 0.64 ha of native vegetation may be cleared as a result of the proposal. This includes 0.29 ha of PCT 277, 0.30 ha of PCT 5 and 0.05 ha of planted native vegetation. This amount of clearing exceeds the 0.5 ha clearing threshold (Table 6-1). As a result, the BOS would be triggered and a BDAR required to accompany the development application (DA).

As part of the BDAR, full floristic plots using the Biodiversity Assessment Methodology (BAM) would need to be undertaken in areas of native vegetation. Targeted surveys for candidate threatened species would need be undertaken to exclude presence. Data collected would be added to the BAM Calculator to determine any offset obligation for the proposal. An offset obligation is generated where threatened species are present on the site or are assumed present (if surveys are not undertaken or conditions are unsatisfactory). The obligation is typically met through payment of a financial contribution to the Biodiversity Conservation Trust (BCT). Prices are subject to market forces and can substantially fluctuate.

7. CONCLUSION

MJM Consulting Engineers has prepared a Planning Proposal for the proposed rezoning of Lot 21 DP1218487. The land is intended to be rezoned from RU1 Primary Production to R5 Large Lot Residential. The minimum lot size applying to the land is intended to be reduced from 200 hectares to 2 hectares, through the Planning Proposal.

Should the Planning Proposal proceed, and the land be rezoned, MJM Consulting Engineers would submit a DA to Wagga Wagga City Council for the proposed subdivision of the land. The proposal would be assessed and determined under Part 4 of the EP&A Act and the BC Act. The proponent intends to subdivide the land for large residential lots, as indicated by the Concept Plan. Lots would range from approximately 2 hectares to 3 hectares.

This report is intended as an initial assessment only, to assist the proponent and the relevant authority for the planning proposal to determine how the rezoning could be supported and biodiversity values maintained. It has been prepared to consider preliminary matters only, including:

- The relevant requirements of the *Biodiversity Conservation Act 2016* (BC Act) and the *Environment Protection and Biodiversity Conservation Act 1999 (*EPBC Act).
- The nature, extent and condition of the flora and fauna at the site,
- The likelihood of any threatened species, communities and populations being present,
- The Biodiversity Offset Scheme (BOS) thresholds assessment,
- Any threatened biota to which a significant effect could occur and propose design or ongoing management measures that could mitigate this.

One EEC occurs within the proposal area. A number of threatened species may potentially occur within the proposal area. (Appendix C). based on the preliminary design concept provided, a significant impact to threatened species or ecological communities, or their habitats, is considered unlikely. A detailed impact assessment would to be prepared to support a future DA.

The preliminary design concepts indicate there may be opportunity to preserve most of the native vegetation within the proposal area. This initial assessment identified that between 0.38 ha and 0.64 ha of native vegetation may be impacted for the construction of roads, utilities and establishment of adequate building envelopes and boundary fencing. Detailed designs are required to determine the full extent of impacts to native vegetation, with further assessment to be undertaken at DA stage.

According to the BC Act, if a proposed development is likely to significantly affect threatened species, the development application is to be accompanied by a BDAR.

It is anticipated that the potential future subdivision may trigger the BC Act thresholds, as outlined in Section 6, requiring a BDAR to be prepared. However, further detailed assessment would be undertaken at DA stage. Reducing impacts to native vegetation including avoidance of wooded vegetation including paddock trees could avoid triggering the BOS thresholds and requirement for a BDAR.

8. REFERENCES

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NSW Scientific Committee (2001) Clearing of native vegetation – key threatening process listing. NSW Scientific Committee – final determination. Accessed http://www.environment.nsw.gov.au/determinations/ClearingNativeVegKTPListing.htm

Office of Environment and Heritage (2016) *Riverina Bioregion.* Accessed at http://www.environment.nsw.gov.au/bioregions.htm

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OEH (2018) NSW BioNet Species Sightings Search. Accessed at http://www.environment.nsw.gov.au/atlaspublicapp/UI_Modules/ATLAS_/AtlasSearch.aspx

APPENDIX A BACKGROUND SEARCHES

A.1 MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	4
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	3
Listed Threatened Species:	29
Listed Migratory Species:	11

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	1
Commonwealth Heritage Places:	None
Listed Marine Species:	18
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

State and Territory Reserves:	None
Regional Forest Agreements:	1
Invasive Species:	30
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar)	[Resource Information]
Name	Proximity
Banrock station wetland complex	700 - 800km upstream
Hattah-kulkyne lakes	500 - 600km upstream
Riverland	600 - 700km upstream
The coorong, and lakes alexandrina and albert wetland	700 - 800km upstream

Listed Threatened Ecological Communities		[Resource Information]
For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.		
Name	Status	Type of Presence
Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	Endangered	Community likely to occur within area
Natural Temperate Grassland of the South Eastern Highlands	Critically Endangered	Community may occur within area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community likely to occur within area

Listed Threatened Species		[Resource Information]
Name	Status	Type of Presence
Birds		
Anthochaera phrygia		
Regent Honeyeater [82338]	Critically Endangered	Foraging, feeding or related behaviour likely to occur within area
Botaurus poiciloptilus		
Australasian Bittern [1001]	Endangered	Species or species habitat may occur within area
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Grantiella picta		
Painted Honeyeater [470]	Vulnerable	Species or species habitat known to occur within area
Lathamus discolor		
Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area
Numenius madagascariensis		
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Polytelis swainsonii		
Superb Parrot [738]	Vulnerable	Species or species habitat known to occur within area
Rostratula australis		
Australian Painted-snipe, Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area

Name	Status	Type of Presence
Fish		
Maccullochella macquariensis Trout Cod [26171]	Endangered	Species or species habitat may occur within area
Maccullochella peelii Murray Cod [66633]	Vulnerable	Species or species habitat known to occur within area
Macquaria australasica Macquarie Perch [66632]	Endangered	Species or species habitat may occur within area
Frogs		
Litoria booroolongensis Booroolong Frog [1844]	Endangered	Species or species habitat likely to occur within area
Litoria raniformis Growling Grass Frog, Southern Bell Frog, Green and Golden Frog, Warty Swamp Frog [1828]	Vulnerable	Species or species habitat may occur within area
Insects		
Synemon plana Golden Sun Moth [25234]	Critically Endangered	Species or species habitat may occur within area
Mammals		
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat may occur within area
Nyctophilus corbeni Corben's Long-eared Bat, South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat likely to occur within area
Petauroides volans Greater Glider [254]	Vulnerable	Species or species habitat may occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat may occur within area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Plants		
Ammobium craspedioides Yass Daisy [20758]	Vulnerable	Species or species habitat likely to occur within area
Amphibromus fluitans River Swamp Wallaby-grass, Floating Swamp Wallaby-grass [19215]	Vulnerable	Species or species habitat may occur within area
Caladenia arenaria Sand-hill Spider-orchid [9275]	Endangered	Species or species habitat may occur within area
Caladenia concolor Crimson Spider-orchid, Maroon Spider-orchid [5505]	Vulnerable	Species or species habitat likely to occur within area
Grevillea wilkinsonii Tumut Grevillea [56396]	Endangered	Species or species habitat known to occur within area
Prasophyllum petilum Tarengo Leek Orchid [55144]	Endangered	Species or species habitat may occur within area

Name	Status	Type of Presence
Swainsona recta		
Small Purple-pea, Mountain Swainson-pea, Small Purple Pea [7580]	Endangered	Species or species habitat may occur within area
Thesium australe		
Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat may occur within area
Reptiles		
Aprasia parapulchella		
Pink-tailed Worm-lizard, Pink-tailed Legless Lizard [1665]	Vulnerable	Species or species habitat likely to occur within area
Delma impar		
Striped Legless Lizard [1649]	Vulnerable	Species or species habitat may occur within area

Listed Migratory Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Hirundapus caudacutus		
White-throated Needletail [682]		Species or species habitat likely to occur within area
Motacilla flava		
Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca		
Satin Flycatcher [612]		Species or species habitat likely to occur within area
Rhipidura rufifrons		
Rufous Fantail [592]		Species or species habitat may occur within area
Migratory Wetlands Species		
Actitis hypoleucos		
Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata		
Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos		
Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii		
Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Numenius madagascariensis		
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Commonwealth Land [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Name

Commonwealth Land - Australian Telecommunications Commission

Listed Marine Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat likely to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Chrysococcyx osculans Black-eared Cuckoo [705]		Species or species habitat likely to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Hirundapus caudacutus White-throated Needletail [682]		Species or species habitat likely to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Myiagra cyanoleuca		
Satin Flycatcher [612]		Species or species habitat likely to occur within area
Numenius madagascariensis		
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Rhipidura rufifrons		
Rufous Fantail [592]		Species or species habitat may occur within area
Rostratula benghalensis (sensu lato)		
Painted Snipe [889]	Endangered*	Species or species habitat may occur within area

Extra Information

Regional Forest Agreements [Resource Information]

Note that all areas with completed RFAs have been included.

Name	State
Southern RFA	New South Wales

Invasive Species [Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
Birds		
Alauda arvensis		
Skylark [656]		Species or species habitat likely to occur within area
Anas platyrhynchos		
Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis		
European Goldfinch [403]		Species or species habitat likely to occur within area
Columba livia		
Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Passer domesticus		
House Sparrow [405]		Species or species habitat likely to occur within area
Passer montanus		
Eurasian Tree Sparrow [406]		Species or species habitat likely to occur within area
Streptopelia chinensis		
Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Turdus merula Common Blackbird, Eurasian Blackbird [596]		Species or species habitat likely to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Capra hircus Goat [2]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Feral deer Feral deer species in Australia [85733]		Species or species habitat likely to occur within area
Lepus capensis Brown Hare [127]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
Genista linifolia Flax-leaved Broom, Mediterranean Broom, Flax Broom [2800]		Species or species habitat likely to occur within area
Nassella neesiana Chilean Needle grass [67699]		Species or species habitat likely to occur within area
Nassella trichotoma Serrated Tussock, Yass River Tussock, Yass Tussock, Nassella Tussock (NZ) [18884]		Species or species habitat likely to occur within area
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within

Name	Status	Type of Presence
		area
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Senecio madagascariensis Fireweed, Madagascar Ragwort, Madagascar Groundsel [2624]		Species or species habitat likely to occur within area
Solanum elaeagnifolium Silver Nightshade, Silver-leaved Nightshade, White Horse Nettle, Silver-leaf Nightshade, Tomato Weed, White Nightshade, Bull-nettle, Prairie-berry, Satansbos, Silver-leaf Bitter-apple, Silverleaf-nettle, Trompillo [12323]		Species or species habitat likely to occur within area
Ulex europaeus Gorse, Furze [7693]		Species or species habitat likely to occur within area

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Coordinates

-35.06309 148.095689,-35.06871 148.108907,-35.076507 148.1041,-35.070887 148.091397,-35.06309 148.095689

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-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
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-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact Us page.

A.2 BIONET RECORDS WITHIN A 10 KM RADIUS OF THE PROPOSAL AREA

Common Name	Scientific Name
Little Eagle	*Hieraaetus morphnoides*
Swift Parrot	*^^Lathamus discolor*
Turquoise Parrot	*^^Neophema pulchella*
Superb Parrot	*^^Polytelis swainsonii*
Brown Treecreeper (eastern subspecies)	*Climacteris picumnus victoriae*
Dusky Woodswallow	*Artamus cyanopterus cyanopterus*
Koala	*Phascolarctos cinereus*
Squirrel Glider in the Wagga Wagga Local Government Area	*Petaurus norfolcensis*
Squirrel Glider	*Petaurus norfolcensis*
Brush-tailed Rock-wallaby	*Petrogale penicillata*
Grey-headed Flying-fox	*Pteropus poliocephalus*
Yellow-bellied Sheathtail-bat	*Saccolaimus flaviventris*
Southern Myotis	*Myotis macropus*
Large Bent-winged Bat	*Miniopterus orianae oceanensis*

A.3 IBRA SUBREGION THREATENED SPECIES SEARCH

Office of Environment & Heritage

Home > Topics > Animals and plants > Search for threatened species > Find by region

Threatened Species found in Inland Slopes IBRA sub-region

Search using criteria below or filter existing results

Status

Show nationally listed species only

Search

Matching records: 148 Save to CSV

Click on column headers to sort

Scientific name ▲	Common name	Conservation project	Type of species	NSW status	Occurrence	Vegetation class
Caladenia arenaria	Sand-hill Spider Orchid	Caladenia arenaria conservation project	Plant > Orchids	Endangered	Known	Show 2 linked vegetation classes
Carex raleighii	Raleigh Sedge	Carex raleighii conservation project	Plant > Herbs and Forbs	Endangered	Known	Show 2 linked vegetation classes
Chalinolobus dwyeri	Large-eared Pied Bat	Chalinolobus dwyeri conservation project	Animal > Bats	Vulnerable	Known	Show 57 linked vegetation classes
Dichanthium setosum	Bluegrass	Dichanthium setosum conservation project	Plant > Herbs and Forbs	Vulnerable	Known	Show 26 linked vegetation classes
Diuris tricolor	Pine Donkey Orchid	Diuris tricolor conservation project	Plant > Orchids	Vulnerable	Known	Show 15 linked vegetation classes
Falco hypoleucos	Grey Falcon	Falco hypoleucos conservation project	Animal > Birds	Endangered	Known	Show 32 linked vegetation classes
Grevillea wilkinsonii	Tumut Grevillea	Grevillea wilkinsonii	Plant >	Endan		

		conservation project	Shrubs	gered	Known	Show 2 linked vegetation classes
Hamirostra melanosternon	Black-breasted Buzzard	Hamirostra melanosternon conservation project	Animal > Birds	Vulnerable	Known	Show 25 linked vegetation classes
Ixobrychus flavicollis	Black Bittern	Ixobrychus flavicollis conservation project	Animal > Birds	Vulnerable	Known	Show 16 linked vegetation classes
Limosa limosa	Black-tailed Godwit	Limosa limosa conservation project	Animal > Birds	Vulnerable	Predicted	Show 15 linked vegetation classes
Litoria raniformis	Southern Bell Frog	Litoria raniformis conservation project	Animal > Amphibians	Endangered	Known	Show 11 linked vegetation classes
Lophoictinia isura	Square-tailed Kite	Lophoictinia isura conservation project	Animal > Birds	Vulnerable	Known	Show 70 linked vegetation classes
Myotis macropus	Southern Myotis	Myotis macropus conservation project	Animal > Bats	Vulnerable	Known	Show 68 linked vegetation classes
Ninox connivens	Barking Owl	Ninox connivens conservation project	Animal > Birds	Vulnerable	Known	Show 67 linked vegetation classes
Pachycephala inornata	Gilbert's Whistler	Pachycephala inornata conservation project	Animal > Birds	Vulnerable	Known	Show 14 linked vegetation classes
Petaurus norfolcensis - endangered population	Squirrel Glider in the Wagga Wagga Local Government Area	Petaurus norfolcensis - endangered population conservation project	Animal > Marsupials	Endangered Population	Known	Show 8 linked vegetation classes

Phascolarctos cinereus	**Koala**	**Phascolarctos cinereus conservation project**	Animal > Marsupials	Vulnerable	Known	**Show 62 linked vegetation classes**
Pomaderris queenslandica	**Scant Pomaderris**	**Pomaderris queenslandica conservation project**	Plant > Shrubs	Endangered	Known	**Show 20 linked vegetation classes**
Competition from feral honey bees, Apis mellifera L.	**Competition from feral honeybees**	**Competition from feral honey bees, Apis mellifera L. conservation project**	Threat > Pest Animal	Key Threatening Process	Predicted	
Bushrock removal	**Bushrock Removal**	**Bushrock removal conservation project**	Threat > Habitat Loss/Change	Key Threatening Process	Predicted	
Invasion of the Yellow Crazy Ant, Anoplolepis gracilipes (Fr. Smith) into NSW	**Invasion of the yellow crazy ant (*Anoplolepis gracilipes*) into NSW**	**Invasion of the Yellow Crazy Ant, Anoplolepis gracilipes (Fr. Smith) into NSW conservation project**	Threat > Pest Animal	Key Threatening Process	Predicted	
Predation by Gambusia holbrooki Girard, 1859 (Plague Minnow or Mosquito Fish)	**Predation by the Plague Minnow (*Gambusia holbrooki*)**	**Predation by Gambusia holbrooki Girard, 1859 (Plague Minnow or Mosquito Fish) conservation project**	Threat > Pest Animal	Key Threatening Process	Predicted	
Competition and habitat degradation by Feral Goats, Capra hircus Linnaeus 1758	**Competition and habitat degradation by Feral Goats, *Capra hircus* Linnaeus 1758**	**Competition and habitat degradation by Feral Goats, Capra hircus Linnaeus 1758 conservation project**	Threat > Pest Animal	Key Threatening Process	Predicted	
Invasion of native plant communities by exotic perennial grasses	**Invasion of native plant communities by exotic perennial grasses**	**Invasion of native plant communities by exotic perennial grasses conservation project**	Threat > Weed	Key Threatening Process	Predicted	
Infection of native plants by Phytophthora cinnamomi	**Infection of native plants by *Phytophthora cinnamomi***	**Infection of native plants by Phytophthora cinnamomi conservation project**	Threat > Disease	Key Threatening Process	Predicted	
Invasion, establishment and spread of Lantana	**Invasion, establishment and spread of Lantana**	**Invasion, establishment and spread of Lantana**	Threat >	Key Threatening	Predicted	

(Lantana camara L. sens. Lat)	(*Lantana camara* L. *sens. lat*)	(Lantana camara L. sens. Lat) conservation project	Weed	Process		
Forest eucalypt dieback associated with over-abundant psyllids and Bell Miners	Forest eucalypt dieback associated with over-abundant psyllids and Bell Miners	Forest eucalypt dieback associated with over-abundant psyllids and Bell Miners conservation project	Threat > Other Threat	Key Threatening Process	Predicted	
Predation and hybridisation by Feral Dogs, Canis lupus familiaris	Predation and hybridisation by Feral Dogs, Canis lupus familiaris	Predation and hybridisation by Feral Dogs, Canis lupus familiaris conservation project	Threat > Pest Animal	Key Threatening Process	Predicted	
Bossiaea fragrans	*Bossiaea fragrans*	Bossiaea fragrans conservation project	Plant > Shrubs	Critically Endangered	Known	Show 2 linked vegetation classes
Hieraaetus morphnoides	Little Eagle	Hieraaetus morphnoides conservation project	Animal > Birds	Vulnerable	Known	Show 99 linked vegetation classes
Circus assimilis	Spotted Harrier	Circus assimilis conservation project	Animal > Birds	Vulnerable	Known	Show 58 linked vegetation classes
Daphoenositta chrysoptera	Varied Sittella	Daphoenositta chrysoptera conservation project	Animal > Birds	Vulnerable	Known	Show 80 linked vegetation classes
Invasion of native plant communities by African Olive Olea europaea subsp. cuspidata (Wall. ex G. Don) Cif.	Invasion of native plant communities by African Olive Olea europaea subsp. cuspidata (Wall. ex G. Don) Cif.	Invasion of native plant communities by African Olive Olea europaea subsp. cuspidata (Wall. ex G. Don) Cif. conservation project	Threat > Weed	Key Threatening Process	Predicted	
Aggressive exclusion of birds from woodland and forest habitat by abundant Noisy Miners, Manorina melanocephala (Latham, 1802)	Aggressive exclusion of birds from woodland and forest habitat by abundant Noisy Miners *Manorina melanocephala*.	Aggressive exclusion of birds from woodland and forest habitat by abundant Noisy Miners, Manorina melanocephala (Latham, 1802) conservation project	Threat > Pest Animal	Key Threatening Process	Predicted	

Acacia meiantha	*Acacia meiantha*	Acacia meiantha conservation project	Plant > Shrubs	Endangered	Predicted	Show 3 linked vegetation classes
Ammobium craspedioides	Yass Daisy	Ammobium craspedioides conservation project	Plant > Herbs and Forbs	Vulnerable	Known	Show 6 linked vegetation classes
Amphibromus fluitans	Floating Swamp Wallaby-grass	Amphibromus fluitans conservation project	Plant > Herbs and Forbs	Vulnerable	Known	Show 6 linked vegetation classes
Ardeotis australis	Australian Bustard	Ardeotis australis conservation project	Animal > Birds	Endangered	Known	Show 29 linked vegetation classes
Austrostipa wakoolica	A spear-grass	Austrostipa wakoolica conservation project	Plant > Herbs and Forbs	Endangered	Predicted	Show 10 linked vegetation classes
Caladenia rosella	Rosella Spider Orchid	Caladenia rosella conservation project	Plant > Orchids	Presumed Extinct	Predicted	Upper Riverina Dry Sclerophyll Forests
Cercartetus nanus	Eastern Pygmy-possum	Cercartetus nanus conservation project	Animal > Marsupials	Vulnerable	Known	Show 62 linked vegetation classes
Certhionyx variegatus	Pied Honeyeater	Certhionyx variegatus conservation project	Animal > Birds	Vulnerable	Known	Show 23 linked vegetation classes
Chalinolobus picatus	Little Pied Bat	Chalinolobus picatus conservation project	Animal > Bats	Vulnerable	Known	Show 40 linked vegetation classes
Delma impar	Striped Legless Lizard	Delma impar conservation project	Animal > Reptiles	Vulnerable	Known	Show 7 linked vegetation classes

Ephippiorhynchus asiaticus	Black-necked Stork	Ephippiorhynchus asiaticus conservation project	Animal > Birds	Endangered	Known	Show 15 linked vegetation classes
Eucalyptus alligatrix subsp. alligatrix	*Eucalyptus alligatrix* subsp. *alligatrix*	Eucalyptus alligatrix subsp. alligatrix conservation project	Plant > Trees	Vulnerable	Known	Show 2 linked vegetation classes
Eucalyptus cannonii	Capertee Stringybark	Eucalyptus cannonii conservation project	Plant > Trees	Vulnerable	Known	Show 10 linked vegetation classes
Grantiella picta	Painted Honeyeater	Grantiella picta conservation project	Animal > Birds	Vulnerable	Known	Show 51 linked vegetation classes
Litoria booroolongensis	Booroolong Frog	Litoria booroolongensis conservation project	Animal > Amphibians	Endangered	Known	Show 35 linked vegetation classes
Melanodryas cucullata cucullata	Hooded Robin (south-eastern form)	Melanodryas cucullata cucullata conservation project	Animal > Birds	Vulnerable	Known	Show 60 linked vegetation classes
Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)	Melithreptus gularis gularis conservation project	Animal > Birds	Vulnerable	Known	Show 39 linked vegetation classes
Oxyura australis	Blue-billed Duck	Oxyura australis conservation project	Animal > Birds	Vulnerable	Known	Show 10 linked vegetation classes
Pandion cristatus	Eastern Osprey	Pandion cristatus conservation project	Animal > Birds	Vulnerable	Known	Show 32 linked vegetation classes
Chthonicola sagittata	Speckled Warbler	Chthonicola sagittata conservation project	Animal > Birds	Vulnerable	Known	Show 50 linked

						vegetation classes
Senecio garlandii	Woolly Ragwort	Senecio garlandii conservation project	Plant > Herbs and Forbs	Vulnerable	Known	Show 5 linked vegetation classes
Stagonopleura guttata	Diamond Firetail	Stagonopleura guttata conservation project	Animal > Birds	Vulnerable	Known	Show 54 linked vegetation classes
Stictonetta naevosa	Freckled Duck	Stictonetta naevosa conservation project	Animal > Birds	Vulnerable	Known	Show 14 linked vegetation classes
Swainsona recta	Small Purple-pea	Swainsona recta conservation project	Plant > Herbs and Forbs	Endangered	Known	Show 6 linked vegetation classes
Tylophora linearis	*Tylophora linearis*	Tylophora linearis conservation project	Plant > Epiphytes and Climbers	Vulnerable	Known	Show 6 linked vegetation classes
Introduction of the Large Earth Bumblebee Bombus terrestris (L.)	Introduction of the large earth bumblebee (*Bombus terrestris*)	Introduction of the Large Earth Bumblebee Bombus terrestris (L.) conservation project	Threat > Pest Animal	Key Threatening Process	Predicted	
High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition	Ecological consequences of high frequency fires	High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition conservation project	Threat > Habitat Loss/Change	Key Threatening Process	Predicted	
Predation by the European Red Fox Vulpes Vulpes (Linnaeus, 1758)	Predation by the European Red Fox	Predation by the European Red Fox Vulpes Vulpes (Linnaeus, 1758) conservation project	Threat > Pest Animal	Key Threatening Process	Predicted	
Importation of Red Imported Fire Ants Solenopsis invicta Buren 1972	Importation of red imported fire ants into NSW	Importation of Red Imported Fire Ants Solenopsis invicta Buren 1972	Threat >	Key Threatening	Predicted	

		conservation project	Pest Animal	Process		
Clearing of native vegetation	Clearing of native vegetation	Clearing of native vegetation conservation project	Threat > Habitat Loss/Change	Key Threatening Process	Predicted	
Competition and grazing by the feral European Rabbit, Oryctolagus cuniculus (L.)	Competition and grazing by the feral European rabbit	Competition and grazing by the feral European Rabbit, Oryctolagus cuniculus (L.) conservation project	Threat > Pest Animal	Key Threatening Process	Predicted	
Invasion and establishment of exotic vines and scramblers	Invasion and establishment of exotic vines and scramblers	Invasion and establishment of exotic vines and scramblers conservation project	Threat > Weed	Key Threatening Process	Predicted	
Loss of Hollow-bearing Trees	Loss of Hollow-bearing Trees	Loss of Hollow-bearing Trees conservation project	Threat > Habitat Loss/Change	Key Threatening Process	Predicted	
Crinia sloanei	Sloane's Froglet	Crinia sloanei conservation project	Animal > Amphibians	Vulnerable	Known	Show 8 linked vegetation classes
Acacia phasmoides	Phantom Wattle	Acacia phasmoides conservation project	Plant > Shrubs	Vulnerable	Known	Western Slopes Dry Sclerophyll Forests
Anseranas semipalmata	Magpie Goose	Anseranas semipalmata conservation project	Animal > Birds	Vulnerable	Known	Show 17 linked vegetation classes
Lophochroa leadbeateri	Major Mitchell's Cockatoo	Lophochroa leadbeateri conservation project	Animal > Birds	Vulnerable	Known	Show 33 linked vegetation classes
Caladenia concolor	Crimson Spider Orchid	Caladenia concolor conservation project	Plant > Orchids	Endangered	Known	Show 2 linked vegetation classes
Calyptorhynchus lathami	Glossy Black-Cockatoo	Calyptorhynchus lathami	Animal >	Vulnerable		Show 63 linked

		conservation project	Birds		Known	vegetation classes
Dasyurus maculatus	Spotted-tailed Quoll	Dasyurus maculatus conservation project	Animal > Marsupials	Vulnerable	Known	Show 70 linked vegetation classes
Eucalyptus robertsonii subsp. hemisphaerica	Robertson's Peppermint	Eucalyptus robertsonii subsp. hemisphaerica conservation project	Plant > Trees	Vulnerable	Predicted	Show 2 linked vegetation classes
Falsistrellus tasmaniensis	Eastern False Pipistrelle	Falsistrellus tasmaniensis conservation project	Animal > Bats	Vulnerable	Known	Show 53 linked vegetation classes
Grus rubicunda	Brolga	Grus rubicunda conservation project	Animal > Birds	Vulnerable	Known	Show 18 linked vegetation classes
Homoranthus darwinioides	*Homoranthus darwinioides*	Homoranthus darwinioides conservation project	Plant > Shrubs	Vulnerable	Predicted	Show 5 linked vegetation classes
Indigofera efoliata	Leafless Indigo	Indigofera efoliata conservation project	Plant > Shrubs	Endangered	Known	Show 4 linked vegetation classes
Leipoa ocellata	Malleefowl	Leipoa ocellata conservation project	Animal > Birds	Endangered	Known	Show 6 linked vegetation classes
Petaurus norfolcensis	Squirrel Glider	Petaurus norfolcensis conservation project	Animal > Marsupials	Vulnerable	Known	Show 52 linked vegetation classes
Petrogale penicillata	Brush-tailed Rock-wallaby	Petrogale penicillata conservation project	Animal > Marsupials	Endangered	Known	Show 48 linked vegetation classes
Phascogale tapoatafa	Brush-tailed	Phascogale	Animal	Vulner		

	Phascogale	tapoatafa conservation project	> Marsupials	able	Predicted	Show 45 linked vegetation classes
Rostratula australis	Australian Painted Snipe	Rostratula australis conservation project	Animal > Birds	Endangered	Known	Show 16 linked vegetation classes
Swainsona sericea	Silky Swainson-pea	Swainsona sericea conservation project	Plant > Herbs and Forbs	Vulnerable	Known	Show 25 linked vegetation classes
Synemon plana	Golden Sun Moth	Synemon plana conservation project	Animal > Invertebrates	Endangered	Known	Show 3 linked vegetation classes
Tyto novaehollandiae	Masked Owl	Tyto novaehollandiae conservation project	Animal > Birds	Vulnerable	Known	Show 66 linked vegetation classes
Anthochaera phrygia	Regent Honeyeater	Anthochaera phrygia conservation project	Animal > Birds	Critically Endangered	Known	Show 50 linked vegetation classes
Zieria ingramii	Keith's Zieria	Zieria ingramii conservation project	Plant > Shrubs	Endangered	Known	Show 2 linked vegetation classes
Zieria obcordata	Granite Zieria	Zieria obcordata conservation project	Plant > Shrubs	Endangered	Known	Show 4 linked vegetation classes
Callocephalon fimbriatum	Gang-gang Cockatoo	Callocephalon fimbriatum conservation project	Animal > Birds	Vulnerable	Known	Show 51 linked vegetation classes
Alteration of habitat following subsidence due to longwall mining	Alteration of habitat following subsidence due to longwall mining	Alteration of habitat following subsidence due to longwall mining conservation project	Threat > Habitat Loss/Change	Key Threatening Process	Predicted	

Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands	Alteration to the natural flow regimes of rivers, streams, floodplains & wetlands.	Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands conservation project	Threat > Habitat Loss/Change	Key Threatening Process	Predicted	
Loss or degradation (or both) of sites used for hill-topping by butterflies	Loss and/or degradation of sites used for hill-topping by butterflies	Loss or degradation (or both) of sites used for hill-topping by butterflies conservation project	Threat > Habitat Loss/Change	Key Threatening Process	Predicted	
Aprasia parapulchella	Pink-tailed Legless Lizard	Aprasia parapulchella conservation project	Animal > Reptiles	Vulnerable	Known	Show 12 linked vegetation classes
Botaurus poiciloptilus	Australasian Bittern	Botaurus poiciloptilus conservation project	Animal > Birds	Endangered	Known	Show 18 linked vegetation classes
Burhinus grallarius	Bush Stone-curlew	Burhinus grallarius conservation project	Animal > Birds	Endangered	Known	Show 60 linked vegetation classes
Caesia parviflora var. minor	Small Pale Grass-lily	Caesia parviflora var. minor conservation project	Plant > Herbs and Forbs	Endangered	Known	Show 15 linked vegetation classes
Caladenia tessellata	Thick Lip Spider Orchid	Caladenia tessellata conservation project	Plant > Orchids	Endangered	Known	Show 26 linked vegetation classes
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	Climacteris picumnus victoriae conservation project	Animal > Birds	Vulnerable	Known	Show 45 linked vegetation classes
Cullen parvum	Small Scurf-pea	Cullen parvum conservation project	Plant > Herbs and Forbs	Endangered	Known	Show 4 linked vegetation classes
Euphrasia collina subsp. muelleri	Mueller's Eyebright	Euphrasia collina subsp. muelleri	Plant >	Endangered		

		conservation project	Herbs and Forbs		Predicted	Show 5 linked vegetation classes
Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions	Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions	Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions conservation project	Community > Threatened Ecological Communities	Endangered Ecological Community	Known	Show 2 linked vegetation classes
Glossopsitta porphyrocephala	Purple-crowned Lorikeet	Glossopsitta porphyrocephala conservation project	Animal > Birds	Vulnerable	Known	Show 14 linked vegetation classes
Hoplocephalus bitorquatus	Pale-headed Snake	Hoplocephalus bitorquatus conservation project	Animal > Reptiles	Vulnerable	Predicted	Show 46 linked vegetation classes
Lathamus discolor	Swift Parrot	Lathamus discolor conservation project	Animal > Birds	Endangered	Known	Show 51 linked vegetation classes
Miniopterus schreibersii oceanensis	Eastern Bentwing-bat	Miniopterus schreibersii oceanensis conservation project	Animal > Bats	Vulnerable	Known	Show 74 linked vegetation classes
Neophema pulchella	Turquoise Parrot	Neophema pulchella conservation project	Animal > Birds	Vulnerable	Known	Show 53 linked vegetation classes
Ninox strenua	Powerful Owl	Ninox strenua conservation project	Animal > Birds	Vulnerable	Known	Show 50 linked vegetation classes
Nyctophilus corbeni	Corben's Long-eared Bat	Nyctophilus corbeni conservation project	Animal > Bats	Vulnerable	Known	Show 41 linked vegetation classes
Persoonia marginata	Clandulla Geebung	Persoonia marginata conservation project	Plant > Shrubs	Vulnerable	Predicted	Show 8 linked

						vegetation classes
Petaurus australis	Yellow-bellied Glider	Petaurus australis conservation project	Animal > Marsupials	Vulnerable	Known	Show 41 linked vegetation classes
Petroica rodinogaster	Pink Robin	Petroica rodinogaster conservation project	Animal > Birds	Vulnerable	Known	Show 11 linked vegetation classes
Pilularia novae-hollandiae	Austral Pillwort	Pilularia novae-hollandiae conservation project	Plant > Ferns and Cycads	Endangered	Known	Show 11 linked vegetation classes
Polytelis swainsonii	Superb Parrot	Polytelis swainsonii conservation project	Animal > Birds	Vulnerable	Known	Show 27 linked vegetation classes
Pomaderris cotoneaster	Cotoneaster Pomaderris	Pomaderris cotoneaster conservation project	Plant > Shrubs	Endangered	Predicted	Show 8 linked vegetation classes
Pomatostomus temporalis temporalis	Grey-crowned Babbler (eastern subspecies)	Pomatostomus temporalis temporalis conservation project	Animal > Birds	Vulnerable	Known	Show 47 linked vegetation classes
Prasophyllum petilum	Tarengo Leek Orchid	Prasophyllum petilum conservation project	Plant > Orchids	Endangered	Known	Show 5 linked vegetation classes
Pteropus poliocephalus	Grey-headed Flying-fox	Pteropus poliocephalus conservation project	Animal > Bats	Vulnerable	Known	Show 66 linked vegetation classes
Predation by the Feral Cat Felis catus (Linnaeus, 1758)	Predation by feral cats	Predation by the Feral Cat Felis catus (Linnaeus, 1758) conservation project	Threat > Pest Animal	Key Threatening Process	Predicted	
Infection of frogs by amphibian chytrid	Infection of frogs by amphibian	Infection of frogs by amphibian chytrid	Threat >	Key Threat		

causing the disease chytridiomycosis	chytrid causing the disease chytridiomycosis	causing the disease chytridiomycosis conservation project	Disease	ening Proces s	Predicted	
Herbivory and environmental degradation caused by feral deer	Herbivory and environmental degradation caused by feral deer	Herbivory and environmental degradation caused by feral deer conservation project	Threat > Pest Animal	Key Threat ening Proces s	Predicted	
Invasion of native plant communities by Chrysanthemoides monilifera	Invasion of native plant communities by bitou bush & boneseed	Invasion of native plant communities by Chrysanthemoides monilifera conservation project	Threat > Weed	Key Threat ening Proces s	Predicted	
Invasion and establishment of Scotch Broom (Cytisus scoparius)	Invasion and establishment of Scotch Broom (*Cytisus scoparius*)	Invasion and establishment of Scotch Broom (Cytisus scoparius) conservation project	Threat > Weed	Key Threat ening Proces s	Predicted	
Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions conservation project	Commu nity > Threate ned Ecologic al Commu nities	Endan gered Ecolog ical Comm unity	Known	Show 3 linked vegetation classes
Glossopsitta pusilla	Little Lorikeet	Glossopsitta pusilla conservation project	Animal > Birds	Vulner able	Known	Show 54 linked vegetation classes
Eucalyptus aggregata	Black Gum	Eucalyptus aggregata conservation project	Plant > Trees	Vulner able	Predicted	Show 12 linked vegetation classes
Petroica phoenicea	Flame Robin	Petroica phoenicea conservation project	Animal > Birds	Vulner able	Known	Show 47 linked vegetation classes
Petroica boodang	Scarlet Robin	Petroica boodang conservation project	Animal > Birds	Vulner able	Known	Show 56 linked vegetation classes
Epthianura albifrons	White-fronted Chat	Epthianura albifrons conservation project	Animal >	Vulner able		Show 24 linked

			Birds		Known	vegetation classes
Euphrasia arguta	*Euphrasia arguta*	Euphrasia arguta conservation project	Plant > Herbs and Forbs	Critically Endangered	Known	Show 16 linked vegetation classes
Calidris ferruginea	Curlew Sandpiper	Calidris ferruginea conservation project	Animal > Birds	Endangered	Known	Show 11 linked vegetation classes
Tablelands Snow Gum, Black Sallee, Candlebark and Ribbon Gum Grassy Woodland in the South Eastern Highlands, Sydney Basin, South East Corner and NSW South Western Slopes Bioregions	Tablelands Snow Gum, Black Sallee, Candlebark and Ribbon Gum Grassy Woodland in the South Eastern Highlands, Sydney Basin, South East Corner and NSW South Western Slopes Bioregions	Tablelands Snow Gum, Black Sallee, Candlebark and Ribbon Gum Grassy Woodland in the South Eastern Highlands, Sydney Basin, South East Corner and NSW South Western Slopes Bioregions conservation project	Community > Threatened Ecological Communities	Endangered Ecological Community	Predicted	Show 10 linked vegetation classes
Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants	Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants	Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants conservation project	Threat > Weed	Key Threatening Process	Predicted	
Falco subniger	Black Falcon	Falco subniger conservation project	Animal > Birds	Vulnerable	Known	
Coolac-Tumut Serpentinite Shrubby Woodland in the NSW South Western Slopes and South Eastern Highlands Bioregions	Coolac-Tumut Serpentinite Shrubby Woodland in the NSW South Western Slopes and South Eastern Highlands Bioregions	Coolac-Tumut Serpentinite Shrubby Woodland in the NSW South Western Slopes and South Eastern Highlands Bioregions conservation project	Community > Threatened Ecological Communities	Endangered Ecological Community	Known	
Artamus cyanopterus cyanopterus	Dusky Woodswallow	Artamus cyanopterus cyanopterus conservation project	Animal > Birds	Vulnerable	Known	Show 104 linked vegetation classes
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	Saccolaimus flaviventris	Animal >	Vulnerable		Show 87 linked

		conservation project	Bats		Known	**vegetation classes**
Varanus rosenbergi	**Rosenberg's Goanna**	**Varanus rosenbergi conservation project**	Animal > Reptiles	Vulnerable	Known	**Show 37 linked vegetation classes**
White Box Yellow Box Blakely's Red Gum Woodland	**White Box Yellow Box Blakely's Red Gum Woodland**	**White Box Yellow Box Blakely's Red Gum Woodland conservation project**	Community > Threatened Ecological Communities	Endangered Ecological Community	Known	**Show 9 linked vegetation classes**
Infection by Psittacine Circoviral (beak and feather) Disease affecting endangered psittacine species and populations	**Infection by Psittacine circoviral (beak and feather) disease affecting endangered psittacine species**	**Infection by Psittacine Circoviral (beak and feather) Disease affecting endangered psittacine species and populations conservation project**	Threat > Disease	Key Threatening Process	Predicted	
Removal of dead wood and dead trees	**Removal of dead wood and dead trees**	**Removal of dead wood and dead trees conservation project**	Threat > Habitat Loss/Change	Key Threatening Process	Predicted	
Predation, habitat degradation, competition and disease transmission by Feral Pigs, Sus scrofa Linnaeus 1758	**Predation, habitat degradation, competition and disease transmission by Feral Pigs (*Sus scrofa*)**	**Predation, habitat degradation, competition and disease transmission by Feral Pigs, Sus scrofa Linnaeus 1758 conservation project**	Threat > Pest Animal	Key Threatening Process	Predicted	
Anthropogenic Climate Change	**Human-caused Climate Change**	**Anthropogenic Climate Change conservation project**	Threat > Habitat Loss/Change	Key Threatening Process	Predicted	
Invasion and establishment of the Cane Toad (Bufo marinus)	**Invasion and establishment of the Cane Toad**	**Invasion and establishment of the Cane Toad (Bufo marinus) conservation project**	Threat > Pest Animal	Key Threatening Process	Predicted	
Acacia ausfeldii	**Ausfeld's Wattle**	**Acacia ausfeldii conservation project**	Plant > Shrubs	Vulnerable	Known	**Show 6 linked vegetation classes**

Pultenaea humilis	**Dwarf Bush-pea**	**Pultenaea humilis conservation project**	Plant > Shrubs	Vulnerable	Known	**Show 3 linked vegetation classes**
Haliaeetus leucogaster	White-bellied Sea-Eagle	**Haliaeetus leucogaster conservation project**	Animal > Birds	Vulnerable	Known	**Show 68 linked vegetation classes**

APPENDIX B SURVEY SPECIES LIST

B.1 FLORA SPECIES LIST

Scientific name	Common name	Family	Exotic
TREES			
Callitris glaucophylla	White Cypress Pine	Cupressaceae	
Eucalyptus camaldulensis	River Red Gum	Myrtaceae	
Eucalyptus melliodora	Yellow Box	Myrtaceae	
Eucalyptus blakelyi	Blakely's Red Gum	Myrtaceae	
Corymbia citiodora	Lemon-scented Gum	Myrtaceae	*
Callistemon spp.	Callistemon spp.	Myrtaceae	
Schinus mole var. areira	Pepper Tree	Anacrdiaceae	*
Eucalyptus polyanthemos	Red Box	Myrtaceae	
SHRUBS, SUB-SHRUBS			
Rubus fruticosus	Blackberry	Rosaceae	*
FORBS			
Mepidioum Spp.	A Peppercress	Brassicaceae	*
Heliotropium europaeum	Potato Weed	Booraginaceae	*
Taraxacum officinale	Dandelion	Asteraceae	*
Xanthium spinosum	Bathurst Burr	Asteraceae	*
Trifolium spp.	A Clover	Fabaceae - Faboideae	*
Hypochaeris radicata	Catsear	Asteraceae	*
Sida Spp.	Sida spp.	Malvaceae	
Portulaca oleracea	Pigeweed	Portulacaceae	
Echium plantagineum	Patterson's Curse	Boraginaceae	*
Euphorbia drummondii	Caustic Weed	Euphorbiaceae	
Citrullus amarus	Camel Melon	Cucurbitaceae	*
Oxalis spp.	Oxalis Spp.	Oxalidaceae	
GRASSES			
Hordeum leporinum	Barley Grass	Poaceae	*
Bromus hordeaceus	Soft Brome	Poaceae	*
Bromus diandrus	Great Brome	Poaceae	*

Scientific name	Common name	Family	Exotic
Elymus scaber	Common wheat grass	Poaceae	
Panicum Spp.	Panicum Spp.	Poaceae	
Avena fatua	Wild Oats	Poaceae	*
Austrostipa	Austrostipa	Poaceae	
Chloris truncate	Windmill Grass	Poaceae	
Cynodon dactylon	Common Couch	Poaceae	
Eragrostis Spp.	A Lovegrass	Poaceae	*

B.2 FAUNA SPECIES LIST

Scientific name	*Common name*	*Observation type*
BIRDS		
Cracticus tibicen	Magpie	Seen
Eolophus roseicapilla	Galah	Seen
Cacatua galerita	Sulphur-crested Cockatoo	Seen
Chenonetta jubata	Australian Wood Duck	Seen
Platycercus eximius	Eastern Rosella	Seen
Manorina melanocephala	Noisy Miner	Seen

APPENDIX C THREATENED SPECIES EVALUATIONS

The tables in this appendix present the habitat evaluation for threatened species, ecological communities and endangered populations listed in a 10km radius from the proposal area in the *Atlas of NSW Wildlife*[1] and those identified as potentially occurring in the area according to the Commonwealth EPBC *Protected Matters Search Tool*[2].

The likelihood of occurrence is based on presence of habitat, proximity of nearest records and mobility of the species (where relevant). The assessment of potential impact is based on the nature of the proposal, the ecology of the species and its likelihood of occurrence. The following classifications are used:

Presence of habitat:

Present: Potential or known habitat is present within the study area

Absent: No potential or known habitat is present within the study area

Likelihood of occurrence

Unlikely: Species known or predicted within the locality but unlikely to occur in the study area

Possible: Species could occur in the study area

Present: Species was recorded during the field investigations

Possible to be impacted

No: The proposal would not impact this species or its habitats. No Assessment of Significance (AoS) is necessary for this species

Yes: The proposal could impact this species or its habitats. An AOS has been applied to these entities.

[1] The *Atlas of NSW Wildlife* is administered by the NSW Department of Environment& Heritage (OEH) and is an online database of fauna and flora records that contains over four million recorded sightings.

[2] This online tool is designed for the public to search for matters protected under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). It is managed by the Commonwealth Department of the Environment and Energy.

C.1 EVALUATION OF THE PRESENCE AND LIKELIHOOD OF THREATENED FLORA SPECIES

Species	Description of habitat[3]	Presence of habitat	Likelihood of occurrence
Grasses			
Austrostipa wakoolica **A spear-grass** **BC- E, EPBC-E**	Confined to the floodplains of the Murray River tributaries of central-western and south-western NSW, with localities including Manna State Forest, Matong, Lake Tooim, Merran Creek, Tulla, Cunninyeuk and Mairjimmy State Forest. Grows on floodplains of the Murray River tributaries, in open woodland on grey, silty clay or sandy loam soils. Habitats include the edges of a lignum swamp with box and mallee; creek banks in grey, silty clay; mallee and lignum sandy-loam flat; open Cypress Pine forest on low sandy range; and a low, rocky rise. Associated species include Callitris glaucophylla, Eucalyptus microcarpa, E. populnea and Austrostipa eremophila.	**Absent** No Murray River tributaries in study area.	**Unlikely** Suitable habitat not present.

[3] Information sourced from species profiles on NSW OEH's threatened species database or the Australian Government's Species Profiles and Threats database (SPRAT) unless otherwise stated.

OEH threatened species database: http://www.threatenedspecies.environment.nsw.gov.au/index.aspx
SPRAT: http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl

Species	Description of habitat[3]	Presence of habitat	Likelihood of occurrence
Amphibromus fluitans **Floating Swamp Wallaby-grass** **BC-V, EPBC - V**	There are many historic collections in the City of Greater Albury. It has been recorded recently in lagoons beside the Murray River near Cooks Lagoon (Shire of Greater Hume), Mungabarina Reserve, East Albury, at Ettamogah, Thurgoona, near Narranderra, and also further west along the Murray River (near Mathoura) and in Victoria. *Amphibromus fluitans* grows mostly in permanent swamps. The species needs wetlands which are at least moderately fertile, and which have some bare ground, conditions which are produced by seasonally-fluctuating water levels. Habitats in south-western NSW include swamp margins in mud, dam and tank beds in hard clay and in semi-dry mud of lagoons with Potamogeton and Chamaeraphis species. Wetlands inhabited by this species that are converted to deep, permanent dams are unsuitable for continued habitation by this species.	**Absent** No fertile wetlands in study area.	**Unlikely** Suitable habitat not present.
Austral Toadflax *Thesium austral* EPBC - V	It occurs in shrubland, grassland or woodland, often on damp sites (George 1984; Harden 1992). Vegetation types include open grassy heath dominated by Swamp Myrtle (Leptospermum myrtifolium), Small-fruit Hakea (Hakea microcarpa), Alpine Bottlebrush (Callistemon sieberi), Woolly Grevillea (Grevillea lanigera), Coral Heath (Epacris microphylla) and Poa spp. (Griffith 1991); Kangaroo Grass grassland surrounded by Eucalyptus woodland; and grassland dominated by Barbed-wire Grass (Cymbopogon refractus) (Leigh et al. 1984; Hunter et al. 1999). At a NSW coastal site, associated plants included Coastal Wattle (Acacia sophorae), Coast Banksia (Banksia integrifolia), Zieria prostrata and Bitou Bush (Chrysanthemoides monilifera) (Cohn 2004).	**Absent** Characteristic species not present in study area.	**Unlikely** Suitable habitat not present.
Herbs & Forbs			
Ammobium craspedioides **Yass Daisy** **BC-V, EPBC- V**	This species is found from near Crookwell on the Southern Tablelands to near Wagga Wagga on the South Western Slopes. It is primarily found in the Yass region. Mostly found in moist or dry forests, Box-Gum Woodland and secondary grassland created from clearing these communities. Appears to be resistant to grazing.	**Present** Occurs in Box Gum Woodland	**Unlikely** Not identified during the field survey

Species	Description of habitat[3]	Presence of habitat	Likelihood of occurrence
Austrostipa metatoris **A spear-grass** **BC-V, EPBC-V**	This species grows in sandy areas of the Murray Valley. It occurs on sandhills, sandridges, undulating plains and flat open mallee country. It grows on red to re-brown clay-loam to sandy-loam soils. Associated species include *Eucalyptus populnea, E. intertexta, Callitris glaucophylla, Casuarina cristata, Santalum acuminatum* and *Dodonaea viscosa*.	**Absent** Characteristics species not present in study area.	**Unlikely** Suitable habitat not present.
Brachyscome muelleroides **Claypan Daisy, Mueller Daisy** **BC-V, EPBC-V**	Occurs in the Wagga Wagga, Narranderra, Tocumwal and Walbundrie areas. Also occurs in north-central Victoria (only along the Murray from Tocumwal to the Ovens River). Only five sites have precise locality details, and four of these are on Morundah Station in NSW. Occurs in seasonally damp situations such as shallow depressions and around the margins of swamps, lagoons and claypans, on heavy grey cracking clays to lighter clay loam soils, in grassland, grassy woodland and open forest habitats, growing in association with various grasses and seasonal aquatic plants such as *Marsilea* species. Associated species include *Pycnosorus globosus, Agrostis avenacea, Austrodanthonia duttoniana*, and *Calotis anthemoides*. Victorian collections have generally come from open positions on the Murray River floodplain, swampy River Red Gum (*Eucalyptus camaldulensis*) Forest and damp depressions.	**Absent** No swamps, lagoons, or cracking clay soils within the study area..	**Unlikely** Suitable habitat not present.
Carex raleighii **Raleigh Sedge** **BC-E**	Raleigh Sedge is confined to areas of over 1000 metres on the Southern Tablelands. It is primarily found in Kosciuzko National Park, the Snowy Plain and on the headwaters of Tantawangalo creek (South East Forests National Park). This species grows in sphagnum bogs, high mountain wetlands and damp grasslands. It is also found along stream-edges in the sub-alpine plains.	**Absent** No sphagnum bogs, high mountain wetlands and damp grasslands in study area.	**Unlikely** Suitable habitat not present.
Cullen Parvum **Small Scurf-pea** **BC- E**	Known NSW populations of the Small Scurf-pea (*Cullen parvum*) are in Jindera, Galong and Young and in and south-west of Wagga Wagga. In Victoria, it has been found in the Red Gum Woodlands in Barmah State Park. This species is found primarily in grassland, River Red Gum Woodland and Box-Gum Woodland. It has also been found on grazed land and next to drainage lines and watercourses. Plants are more easily found in winter or spring because they die back in dry seasons, surviving underground.	**Present** River Red Gum Woodland and Box-Gum Woodland with watercourses in study area.	**Possible** Suitable habitat present

Species	Description of habitat[3]	Presence of habitat	Likelihood of occurrence
Dichanthium setosum **Bluegrass** **BC-V, EPBC- V**	Bluegrass is known to the New England Tablelands, North West Slopes and Plains and the Central Western Slopes in NSW. It frequently occurs on private property. The soils it prefers are basaltic black soils and red-brown loams with clay subsoil. It is associated with disturbed woodland, pasture and grassy roadside vegetation. It is unclear whether this is because it prefers disturbed habitat, or because the habitat type is frequently disturbed. It appears to have a tolerance for a wide range of habitat types.	**Present** Disturbed woodland and pasture with red-brown loams with clay subsoil in study area.	**Possible** Suitable habitat present
Euphrasia arguta **Euphrasia arguta** **BC-CE, EPBC-CE**	This species is predicted in the Inland Slopes. It grows in open forest with grassy and shrubby understoreys and grassland. It has also been found on roadsides. It was thought to be extinct but was rediscovered in 2008 at Nundle State Forest in eucalypt forest. Historical records indicate it occurs mostly in grassy areas near rivers at elevations of up to 700m above sea level.	**Absent** No open forest with grassy and shrubby understoreys in study area.	**Unlikely** Suitable habitat not present.
Euphrasia collina subsp. Meulleri **Mueller's Eyebright** **BC- E, EPBC-E**	This species has not been recorded in NSW in over 100 years. Now, it is now only known in the Mornington Peninsula, near Melbourne. Habitat is in heathy and grassy woodland and in sandy open forests.	**Absent** Study area outside species known distribution, no good quality woodland in study area.	**Unlikely** Suitable habitat not present.
Senecio garlandii **Woolly Ragwort** **BC- V**	It is found between Temora, Bethungra, Albury and Chiltern (Victoria). It may also occur at Burrinjuck. It grows on sheltered slopes of rocky outcrops. It occurs in dry sclerophyll forests, grassy woodlands, semi-arid woodlands and on rocky cliffs.	**Absent** No sheltered slopes or rocky outcrops within development area.	**Unlikely** Suitable habitat not present.

Species	Description of habitat[3]	Presence of habitat	Likelihood of occurrence
Swainsona murrayana **Slender Darling Pea** **BC-V, EPBC-V**	Occurs from South Australia through south-west Victoria and central NSW to south-east Queensland. Found in grassland, herbland, and open Black-box woodland, often in depressions. Has been collected from clay-based soils, ranging from grey, red and brown cracking clays to red-brown earths and loams. Grows in a variety of vegetation types including bladder saltbush, black box and grassland communities on level plains, floodplains and depressions and is often found with Maireana species. Plants have been found in remnant native grasslands or grassy woodlands that have been intermittently grazed or cultivated. Plants produce winter-spring growth, flower in spring to early summer and then die back after flowering. They re-shoot readily and often carpet the landscape after good cool-season rains.	**Absent** No grassland, herbland, or open Black-box woodland in study area.	**Unlikely** Suitable habitat not present.
Swainsona recta **Small Purple-pea** **BC-E, EPBC- E**	It has been recorded previously at Carcoar, Culcairn and Wagga Wagga but is thought to be extinct from these areas. Populations are still present in Queenbeyan, the ACT and Wellington-Mudgee areas. Plants are commonly found on railway easements. It occurs in the grassy understory of woodlands, and open-forests dominated by Blakely's Red Gum *Eucalyptus blakelyi*, Yellow Box *E. melliodora*, Candlebark Gum *E. rubida* and Long-leaf Box *E. goniocalyx.* They are found in dry sclerophyll forests, grasslands, and grassy woodlands.	**Present** Grassy woodland with characteristic species in study area.	**Possible** Suitable habitat present
Swainsona sericea **Silky Swainson-pea** **BC-V**	This species has been found from the Northern Tablelands to the Southern Tablelands and further inland. It is found in Natural Temperate Grassland and Snow Gum *Eucalyptus pauciflora* Woodland, as well as in Box-Gum Woodland and with cypress-pines. It is also found in arid shrublands, Riverine Chenopod Shrublands, dry and wet sclerophyll forests, woodlands and grasslands.	**Present** Box Gum woodland in study area.	**Possible** Suitable habitat present

Species	Description of habitat[3]	Presence of habitat	Likelihood of occurrence
Epiphytes and Climbers			
Tylophora linearis **Tylophora linearis** **BS- V, EPBC-E**	Tylophora linearis grows in dry scrub and open forest. It is found in both grassy and shrubby dry sclerophyll forests. Recorded from low-altitude sedimentary flats in dry woodlands of *Eucalyptus fibrosa, Eucalyptus sideroxylon, Eucalyptus albens, Callitris endlicheri, Callitris glaucophylla* and *Allocasuarina luehmannii*. Also grows in association with *Acacia hakeoides, Acacia lineata, Melaleuca uncinata, Myoporum* species and *Casuarina* species.	**Present** Grassy woodland with characteristic species in study area.	**Unlikely** Groundcover is highly disturbed and dominated by exotic species.
Ferns and cyads			
Pilularia novae-hollandiae **Austral Pillwort** **BC-E, EPBC- not listed**	The Austral Pillwort (*Pilularia novae-hollandiae*) has been found in Sydney, Oolambeyan National Park, Canberra, at Lake Cowal and in parts of Victoria. It is also found in the Riverina between Albury and Urana. It is found in shallow swamps and waterways. It is commonly found in table drains and on the side of the road. It can be difficult to find, given it is most likely ephemeral.	**Present** Waterways present in study area.	**Unlikely** Groundcover is highly disturbed and dominated by exotic species.
Shrubs			
Acacia meiantha **Acacia meiantha** **BC-E, EPBC-E**	It is found in the Central Tablelands. Specifically, they have been found in Clarence, Mullions Range and Aarons Pass. They are predicted in the Inland Slopes to occur in dry sclerophyll forests or woodland with shrubby understorey. They grow on sandy to clayey soil.	**Present** Dry woodland with clayey soils in study area.	**Unlikely** Species not detected during site survey

Species	Description of habitat[3]	Presence of habitat	Likelihood of occurrence
Acacia phasmoides **Phantom Wattle** **BC-V, EPBC-V**	The only known location in NSW is the Woomagarma National Park in Greater Hume Shire. It is also found at Burrowa-Pine Mountain National Park in Victoria. It grows in shrubby woodland on sandy, granitic soil near creeks or in rocky crevices.	**Absent** Outside species known distribution. No shrubby woodland on sandy, granitic soil near creeks or in rocky crevices in study area.	**Unlikely** Species not detected during site survey
Grevillea wilkinsonii **Tumut Grevillea** **BC-E, EPBC-E**	The main location this species is found is in a 6km stretch of Goobarrangandra River, east of Tumut. The only other place it is known is between two private properties at Gundagai. At Goobarrangandra River, plants are found close to the water in open, sunny areas and in rocky, loamy soils. The associated native vegetation in the Goobarragandra sites are typically remnant riverine shrub communities adjacent to open-forest, with the most common tree species being Blakely's Red Gum (*Eucalyptus blakelyi*), Apple Box (*E. bridgesiana*), Yellow Box (*E. melliodora*), and Red Stringybark (*E. macrorhyncha*) and with Kurrajongs (*Brachychiton populneus*) sometimes growing in nearby paddocks.	**Absent** Study area outside species known distribution.	**Unlikely** Species not detected during site survey
Homoranthus darwinioides **Homoranthus darwinioides** **BC-V, EPBC- V**	Occurs in the central tablelands and western slopes of NSW, from Putty to the Dubbo district. It is also found west of Muswellbrook between Merriwa and Bylong and north of Muswellbrook to Goonoo SCA. It grows in woodland habitat with shrubby understoreys, typically in gravely sandy soils. They have been recorded on flat sunny ridge tops with scrubby woodland, sloping ridges, gentle south-facing slopes and on roadsides.	**Absent** No woodland habitat with shrubby understoreys and gravely sandy soils in study area.	**Unlikely** Suitable habitat not present.
Indigofera efoliata **Leafless Indigo** **BC-E, EPBC- E**	This species is extremely rare and may be extinct. It was found near to Dubbo. It can be difficult to identify because it dies back in adverse conditions. It has been found in dry sclerophyll forests and grassy woodlands. It grows on slight rises in stony red-brown sandy loam.	**Absent** Study area outside species known distribution.	**Unlikely** Suitable habitat not present.

Species	Description of habitat[3]	Presence of habitat	Likelihood of occurrence
Persoonia marginata **Clandulla Geebung** **BC-V, EPBC-V**	This species is found in dry sclerophyll forest and woodland. It grows in sandstone and clayey soil and is only found in the Capertee district in central-eastern NSW.	**Absent** Study area outside species known distribution.	**Unlikely** Suitable habitat not present.
Pomaderris cotoneaster **Cotoneaster Pomaderris** **BC-E, EPBC-E**	This species is known from the Nungatta area, northern Kosciusko National Park, the Tantawangalo area (South-East Forests National Park), Badgery's Lookout (Tallong), Bungonia State Conservational Area, Yerranderie, Kanangra- Boyd National Park, Canyonleigh and Ettrema Gorge (Morton National Park). The Cotoneaster Pomaderris is primarily found in forested areas and prefer friable soils. They generally grow amongst rocks adjacent to streams and at the bottom of steep slopes.	**Absent** Study area outside species known distribution. No rocky areas in study area.	**Unlikely** Suitable habitat not present.
Pomaderris queenslandica **Scant Pomaderris** **BC-E**	This species is widely scattered in north-east NSW. It is known on many locations on the north coast and on the New England Tablelands and North West Slopes in NSW. It is mostly found in eucalypt forest and sheltered woodlands with a shrubby understorey, and occasionally along creeks.	**Absent** No sheltered woodlands with a shrubby understorey in study area.	**Unlikely** Suitable habitat not present.
Ziera ingramii **Keith's Ziera** **BC-E, EPBC-E**	It is primarily found in Goonoo SCA, north-east of Dubbo. It is found in dry sclerophyll forests in light sandy soils. It is mostly found in woodland or open forests with a shrubby to heathy understorey on red-brown and yellow-brown sandy loams. It occurs on gentle rocky slopes or near the crests of low rises in undulating terrain, above 390m altitude.	**Absent** Study area outside species known distribution. No sheltered woodlands with a shrubby understorey or rocky slopes in study area.	**Unlikely** Suitable habitat not present.

Species	Description of habitat[3]	Presence of habitat	Likelihood of occurrence
Zieria obcordate **Aieria obcordate** **BC-E, EPBC-E**	This species only occurs in Wuuluman area near Wellington and Crackerjack Rock. It grows in eucalypt woodland or shrubland dominated by species of *Acacia.* It is also found in *Eucalypt* and *Callitris* dominated woodland. It occurs on sites with an altitude of 500-830 metres. This species prefers areas that are shaded and have well-draining soil. It is primarily found in sandy soil and occasionally between granite boulders.	**Absent** Study area outside species known distribution. No eucalypt woodland or shrubland dominated by species of *Acacia* in study area.	**Unlikely** Species not detected during site survey
Orchids			
Diuris tricolor **Pine Donkey Orchid** **BC-V**	It is sporadically distributed on the western slopes of NSW, extending from south of Narrandera all the way to the far north of NSW. Localities include the Condobolin-Nymagee road, Wattamondara towards Cowra, Cooyal, Adelong, Red Hill north of Narrandera, Coolamon, near Darlington Point, Eugowra, Girilambone, Dubbo, Muswellbrook, and several sites west of Wagga Wagga. Associated species include *Callitris glaucophylla, Eucalyptus populnea, Eucalyptus intertexta*, Ironbark and *Acacia* shrubland. The understorey is often grassy with herbaceous plants such as *Bulbine* species. It is found in sandy soils, either on flats or small rises. Also recorded from a red earth soil in a Bimble Box community in western NSW.	**Absent** Characteristic species not present within the study area.	**Unlikely** Suitable habitat not present.
Caladenia arenaria **Sand-hill Spider Orchid** **BC-E, EPBC- E**	The Sand-hill Spider Orchid occurs in the south west planes and western south west slopes of NSW. It has been recorded from Nangus and Adelong and may have been sighted near Cootamundra. It is currently thought to occur only in the Riverina between Urana and Narranderra. This species grows in sandy soil within woodlands and is associated with White Cypress Pine (*Callitris glaucophylla*). It may be difficult to identify because it becomes dormant and survives underground during hot summers.	**Absent** No sandy soil within woodlands with White Cypress Pine in study area.	**Unlikely** Suitable habitat not present.

Species	Description of habitat[3]	Presence of habitat	Likelihood of occurrence
Caladenia concolor **Crimson Spider Orchid** **BC-E, EPBC-V**	The only known South-Western Slopes Inland location of this species is to the west of Jingellic, NSW. It is found in dry sclerophyll forests and grassy woodlands. It is commonly amongst low heathy shrubs and within Box-Ironbark ecosystems. They typically grow in gravelly or stony sand and clay loam, and always in well-draining soil.	**Absent** Study area outside species known distribution. No low heathy shrubs or Box-Ironbark woodlands in study area.	**Unlikely** Suitable habitat not present.
Caladenia tessellate **Thick Lip Spider Orchid** **BC-E, EPBC-V**	The Thick Lip Spider Orchid (*Caladenia tessellate*) has been found in Sydney, Wyong, Ulladulla and Braidwood. It is also found on the east coast of Victoria, from east Melbourne, up to near the NSW boarder. It is primarily found in grassy sclerophyll woodland, but has been found in low woodland, in stony soil. In Victoria, it is found in healthlands, grassy or heathy woodlands and grassy or sedgy open forests. Typically, this species occurs on clay loam or sandy soils.	**Absent** Study area outside species known distribution.	**Unlikely** Suitable habitat not present.
Diuris pedunculata **Small Snake Orchid** **BC-E, EPBC-E**	This species is found in north east NSW. It grows on grassy slopes or flats, in peaty or clayey or stony loam soils in moist areas. It is also found on shale and trap soils, fine granite and among boulders. It has been found in open areas of dry sclerophyll forests with grassy understories, in riparian forests, swap forests, sub-alpine grasslands and herbfields.	**Absent** Study area outside species known distribution.	**Unlikely** Suitable habitat not present.
Prasophyllum petilum **Tarengo Leek Orchid** **BC-E. EPBC-E**	The Tarengo Leek Orchid is known to occur in Boorowa, Queanbeyan, Ilford, Delegate and west of Muswellbrook. This species has been found in open grassy woodland and grassland and prefers moist environments. It is found primarily in loam, clay or sandy soils.	**Absent** Study area outside species known distribution.	**Unlikely** Suitable habitat not present.

Species	Description of habitat[3]	Presence of habitat	Likelihood of occurrence
Trees			
Eucalyptus aggregate **Black Gum** **BC-V, EPBC-V**	This species is found in the NSW Central and Southern Tablelands, and small numbers occur in Victoria and the ACT. It typically occurs in the cooler, higher, wetter areas of the tablelands. They grow on alluvial soils on cold, poorly-drained flats and hollows next to creeks and rivers. Often found in open, grassy woodland with other Eucalypt species and few shrubs.	**Absent** Study area outside species known distribution.	**Unlikely** Species not detected during site survey.
Eucalyptus alligatrix subsp. Alligatrix **BC-V, EPBC- V**	Only known at a single location south-west of Rylston. It grows in dry sclerophyll woodland on shallow relatively infertile soils (grey brown loam with ironstone). It may have been part of a more-extensive open woodland community prior to the commencement of clearing and grazing.	**Absent** Study area outside species known distribution.	**Unlikely** Species not detected during site survey.
Eucalyptus cannonii **Capertree Stringybark** **BC-V**	The Capertee Stringybark is predominantly restricted to the central tablelands and slopes of NSW between the Golden Highway and the Mitchell Highway. The species' distribution is bounded from east of Bathurst, to Wallerwang near Lithgow, north along the western edge of Wollemi National Park and north-west to Mudgee; isolated occurrences are known from a short way north of Goulburn River National Park between Dunedoo and Merriwa.	**Absent** Study area outside species known distribution.	**Unlikely** Species not detected during site survey.
Eucalyptus robertsonii subsp. Hemisphaerica **Robertson's Peppermint** **BC-V, EPBC- V**	It is only known in the central tablelands in NSW, from Orange to Burraga. This species occurs in grassy or dry sclerophyll forest or woodland, in sheltered locations. It grows on quartzite ridges, upper slopes and on shallow clay.	**Absent** Study area outside species known distribution.	**Unlikely** Species not detected during site survey.

Species	Description of habitat[3]	Presence of habitat	Likelihood of occurrence
EECs			
Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions **BC – E**	Tall woodland or open forest dominated by Fuzzy Box Eucalyptus conica, often with Grey Box Eucalyptus microcarpa, Yellow Box Eucalyptus melliodora, or Kurrajong Brachychiton populneus. Buloke Allocasuarina luehmannii is common in places. Shrubs are generally sparse, and the groundcover moderately dense, but varies with season. Found on alluvial soils of the South West Slopes, Brigalow Belt South and Darling Riverine Plains Bioregions. Mainly found in the Dubbo-Narromine-Parkes-Forbes area. Community occurs on brown loam or clay, alluvial or colluvial soils on prior streams and abandoned channels or slight depressions on undulating plains or flats of the western slopes. Community often occurs upslope from River Red Gum communities above frequently inundated areas of the floodplain. It also occurs on colluvium soils on lower slopes and valley flats. Shrubs include Wilga, Deane's Wattle, Hop Bush, Cassia, Water Bush and Sifton Bush.	**Absent** No associated species within the development site.	**Unlikely-** not identified during site survey.

Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia **EPBC- E**	Predominantly occurs on the drier edge of the temperate grassy eucalypt woodland belt and ranges from central New South Wales through northern and central Victoria into South Australia. In NSW it can be transitional between the temperate lower slopes and tablelands occupied by, e.g. the EPBC Act-listed White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland ecological community, and the semi-arid floodplain communities. Generally occurs in landscapes of low-relief such as flat to undulating plains, low slopes and rises and, to a lesser extent, drainage depressions and flats. The ecological community may extend to more elevated hillslopes on the fringes of its range where it intergrades with other woodland or dry sclerophyll forest communities. Often occurs on productive soils derived from alluvial or colluvial materials but may occur on a range of substrates. Soils include: duplex soils; red-brown earths; gradational soils; non-calceric and calceric browns with variable textures including sandy clay loam, clay loam, sandy loam, loam, heavy clay; and loams with quartzite surface stones and rocky outcroppings in the Mount Lofty Ranges. Gilgai topography may be present. The ecological community tends to occupy drier sites within the belt of grassy woodlands in south-eastern Australia (Prober and Thiele, 1993). The mean annual rainfall associated with the distribution of the ecological community lies in the range 375-700 mm/year. The typical structure of ecological community is a woodland to open forest with a canopy dominated by eucalypts and an understorey with a moderately dense to sparse shrub layer and a ground layer of perennial and annual native forbs and graminoids. Tussock grasses dominate the ground layer vegetation, though other graminoids or forbs may be common. Chenopods also may be present in the ground layer. The tree canopy is dominated (≥ 50% canopy crown cover) by Eucalyptus microcarpa (Grey Box). Widespread associated tree species that may be present include: Allocasuarina luehmannii (Buloke), Brachychiton populneus (Kurrajong), Callitris glaucophylla (White Cypress Pine), Eucalyptus albens (White Box), E. camaldulensis (River Red Gum), E. conica (Fuzzy Box), E. leucoxylon (Yellow Gum, SA Blue Gum), E. melliodora (Yellow Box) and E. populnea (Bimble Box, Poplar Box). The ground layer also is highly variable in development and composition, ranging from almost absent to mostly grassy to forb-rich. Ground layer flora commonly present include one or more of the graminoid genera: Austrodanthonia, Austrostipa, Elymus, Enteropogon, Dianella and Lomandra; and one or	**Absent** No associated species within the development site.	**Unlikely-** not identified during site survey.

Species	Description of habitat[3]	Presence of habitat	Likelihood of occurrence
	more of the chenopod genera: Atriplex, Chenopodium, Einadia, Enchylaena, Maireana, Salsola and Sclerolaena. Derived grasslands are a special state of the ecological community, whereby the canopy and mid layers have been mostly removed to <10% crown cover but the native ground layer remains largely intact, with 50% or more of the total vegetation cover being native.		
Mallee and Mallee-Broombush dominated Woodland and Shrubland, lacking Triodia, in the NSW South Western Slopes Bioregion **BC-CEEC**	A low woodland that occurs in the West Wyalong area. The trees are *Eucalyptus polybractea* (Blue Mallee), *Eucalyptus behriana* (Bull Mallee), *Eucalyptus viridis* (Green Mallee), *Eucalyptus dumosa* (White Mallee) which may occur in varying proportions and not necessarily together. Understorey shrubs and groundcovers can be present in varying densities, from sparse to dense depending on site management history and substrate. *Melaleuca uncinata* (Broombush) may or may not occur. Mainly occurs on red loamy soils. Has been recorded from the local government areas of Bland and Temora, within the NSW South Western Slopes Bioregion, but may occur elsewhere in the Bioregion. Has a very highly restricted distribution, with known occurrences falling within a region of less than 4000 km2 bounded by Lake Cowal - Temora - Ardlethan - Ungarie. Occurs mainly on private lands and roadside easements.	**Absent** No associated species within the development site.	**Unlikely-** not identified during site survey.

Species	Description of habitat[3]	Presence of habitat	Likelihood of occurrence
Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions **BC-EEC, EPBC-EEC**	Scattered across the eastern parts of the alluvial plains of the Murray-Darling river system. Typically, it occurs on red-brown earths and heavy textured grey and brown alluvial soils within a climatic belt receiving between 375 and 500 mm mean annual rainfall. The structure of the community varies from low woodland and low open woodland to low sparse woodland or open shrubland, depending on site quality and disturbance history. The tree layer grows up to a height of about 10 metres and invariably includes Acacia pendula (Weeping Myall or Boree) as one of the dominant species or the only tree species present. The understorey includes an open layer of chenopod shrubs and other woody plant species and an open to continuous groundcover of grasses and herbs. The structure and composition of the community varies, particularly with latitude, as chenopod shrubs are more prominent south of the Lachlan River district, while other woody species and summer grasses are more common further north. In some areas the shrub and canopy stratum may have been reduced or eliminated by clearing or heavy grazing, leaving derived grassland that may still constitute this community. This EEC is known from parts of the Local Government Areas of Berrigan, Bland, Bogan, Carrathool, Conargo, Coolamon, Coonamble, Corowa, Forbes, Gilgandra, Griffith, Gwydir, Inverell, Jerilderee, Lachlan, Leeton, Lockhart, Moree Plains, Murray, Murrumbidgee, Narrabri, Narranderra, Narromine, Parkes, Urana, Wagga Wagga and Warren, and but may occur elsewhere in these bioregions.	**Absent** No associated species within the development site.	**Unlikely-** not identified during site survey.

Species	Description of habitat[3]	Presence of habitat	Likelihood of occurrence
Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions **BC - EEC**	Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions is the name given to the ecological community dominated by White Cypress Pine (*Callitris glaucophylla*). Sandhill Pine Woodland is characterised by an open tree stratum, which may be reduced to isolated individuals or may be absent as a result of past clearing. The tree layer is dominated by *C. glaucophylla*, either in pure stands or with a range of other less abundant trees or tall shrubs. In the Riverina bioregion and the far south-western portion of the NSW South Western Slopes bioregion, the community is typically associated with prior streams and aeolian source-bordering dunes, which are scattered within an extensive alluvial clay plain dominated by chenopod shrublands. Sandhill Pine Woodland typically occupies red-brown loamy sands with alkaline sub-soils on the alluvial plain of the Murray River and its tributaries, and on parts of the sandplain in south-western NSW. The structure of the community varies depending on past and current disturbances, particularly clearing, logging, grazing and soil erosion, with species composition of sites being influenced by their size, recent rainfall or drought conditions and by their disturbance history, including grazing, land clearing and fire.	**Absent** No associated species within the development site.	**Unlikely-** not identified during site survey.

Species	Description of habitat[3]	Presence of habitat	Likelihood of occurrence
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland **BC – E** **EPBC - CE**	Characterised by the presence or prior occurrence of White Box, Yellow Box and/or Blakely's Red Gum. The trees may occur as pure stands, mixtures of the three species or in mixtures with other trees, including wattles. Commonly co-occurring eucalypts include Apple Box (E. bridgesiana), Red Box (E. polyanthemos), Candlebark (E. rubida), Snow Gum (E. pauciflora), Argyle Apple (E. cinerea), Brittle Gum (E. mannifera), Red Stringybark (E. macrorhyncha), Grey Box (E. microcarpa), Cabbage Gum (E. amplifolia) and others. The understorey in intact sites is characterised by native grasses and a high diversity of herbs; the most commonly encountered include Kangaroo Grass (Themeda australis), Poa Tussock (Poa sieberiana), wallaby grasses (Austrodanthonia spp.), spear-grasses (Austrostipa spp.), Common Everlasting (Chrysocephalum apiculatum), Scrambled Eggs (Goodenia pinnatifida), Small St John's Wort (Hypericum gramineum), Narrow-leafed New Holland Daisy (Vittadinia muelleri) and blue-bells (Wahlenbergia spp.). Shrubs are generally sparse or absent, though they may be locally common. Remnants generally occur on fertile lower parts of the landscape where resources such as water and nutrients are abundant. Some of the component species (e.g. wattles, she-oaks, native legumes) fix nitrogen that is made available to other species in the community, while fallen timber and leaves recycle their nutrients. Disturbed remnants are considered to form part of the community, including where the vegetation would respond to assisted natural regeneration.	**Present** Yellow Box and Blakely's Red Gum does occur within the study area.	**Present** Characteristic species identified during site survey.
Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions BC-E, EPBC-E	This community includes woodlands where *Eucalyptus macrocarpa* (Inland Grey Box) is found with *E. populnea spp. Bimbil* (Bimble Box), C*allitris glaucophylla* (White Cypress Pine), *Brachychiton populneus* (Kurrajong), *Allocasuarina luehmannii* (Bulloak) or *E. melliodora* (Yellow Box), and sometimes with *E. albens* (White Box). Shrubs are usually few or absent. Groundcover is typically grass or and herbaceous species. At an uncleared site, trees are in an open woodland formation, typically 15-25m tall. At times there is no overstorey because of clearing. This community occurs in the Riverina and South West Slopes and plains. Rainfall is typically 375-800mm pa and the mean maximum diurnal temperature is 22-26ºC. Soils are fertile and are commonly Teriary and Quanternary alluvial origin.	**Absent** No associated species within the development site.	**Unlikely-** not identified during site survey.

Species	Description of habitat[3]	Presence of habitat	Likelihood of occurrence
Coolac-Tumut Serpentinite Shrubby Woodland in the NSW South Western Slopes and South Eastern Highlands Bioregions BC-EEC	A low woodland that occurs in the West Wyalong area. The trees are Eucalyptus polybractea (Blue Mallee), Eucalyptus behriana (Bull Mallee), Eucalyptus viridis (Green Mallee), Eucalyptus dumosa (White Mallee) which may occur in varying proportions and not necessarily together. Understorey shrubs and groundcovers can be present in varing densities, from sparse to dense depending on site management history and substrate. Melaleuca uncinata (Broombush) may or may not occur. Mainly occurs on red loamy soils. Has been recorded from the local government areas of Bland and Temora, within the NSW South Western Slopes Bioregion, but may occur elsewhere in the Bioregion. Has a very highly restricted distribution, with known occurrences falling within a region of less than 4000 km2 bounded by Lake Cowal - Temora - Ardlethan - Ungarie. Occurs mainly on private lands and roadside easements and is poorly represented in conservation reserves.	**Absent** No associated species within the development site.	**Unlikely**- not identified during site survey.
Tablelands Snow Gum, Black Sallee, Candlebark and Ribbon Gum Grassy Woodland in the South Eastern Highlands, Sydney Basin, South East Corner and NSW South Western Slopes Bioregions **BC - EEC**	This community, commonly referred to as Tablelands Snow Gum Grassy Woodland, occurs as an open-forest, woodland or open woodland. This community may also occur as a secondary grassland where the trees have been removed, but the groundlayer remains. The the main tree species are Eucalyptus pauciflora (Snow Gum), E. rubida (Candlebark), E. stellulata (Back Sallee) and E. viminalis (Ribbon Gum), either alone or in various combinations. Other eucalypt species may occur. A shrub layer may be present and sub-shrubs are common. The most common shrubs include Melicytus sp. 'Snowfileds' (Gruggly-bush) and Melichrus urceolatus (Urn Heath). The ground layer is grassy, with the most common species including Themeda australis (Kangaroo Grass), Poa spp. (snow-grasses), Austrostipa spp. (spear-grasses) and Rytidosperma spp. (wallaby-grasses). Sites in high condition have a range of forb (wildlfower) species, including Leptorhynchos squamatus (Scaly-buttons), Chrysocephalum apiculatum (Common Everlastings) and Asperula conferta (Native Woodlruff). Many threatened flora and fauna species have been recorded in this community. The community commonly occurs on valley floors, margins of frost hollows and on footslopes and undulating hills. It occurs between approximately 600 and 1400 m in altitude on a variety of substrates, including basalt, sediments, granite, colluvium and alluvium.	**Absent** No associated species within the development site.	**Unlikely-** not identified during site survey.

C.2 EVALUATION OF THE PRESENCE AND LIKELIHOOD OF THREATENED FAUNA

Species and Status	Description of habitat[4]	Presence of habitat	Likelihood of occurrence
Aves			
Anseranas semipalmata **Magpie Goose** **BC-V**	Typically found in shallow wetlands (less than 1m deep) with dense growth of rushes or sedges. Occupies both aquatic and terrestrial habitats. Found in arid and riverine shrublands (Chenopod formation), forested wetlands, freshwater wetlands, dry ephemeral swamps, floodplains, grasslands and semi-arid woodlands. Wetlands are important habitat, particularly those on floodplains and large shallow wetlands created by runoff. Nests are formed in trees over deep water. Breeding can occur in summer and winter, and is dependent on rain and water levels.	**Absent** No wetlands in study area.	**Unlikely-** Suitable habitat not present
Anthochaera phrygia **Regent Honeyeater** **BC - CE** **EPBC – CE**	A semi-nomadic species occurring in temperate eucalypt woodlands and open forests. Most records are from box-ironbark eucalypt forest associations and wet lowland coastal forests (NPWS, 1999 177 /id) (Pizzey, 1997). A semi-nomadic species occurring in temperate eucalypt woodlands and open forests. Most records are from box-ironbark eucalypt forest associations and wet lowland coastal forests (NPWS, 1999 177 /id) (Pizzey, 1997).	**Absent** No box-ironbark eucalypt forest in study area.	**Unlikely-** Suitable habitat not present
Ardeotis australis **Australian Bustard** **BC-E**	This species primarily inhabits inland Australia. Breeding now only occurs in the north-west region of NSW. It mainly occurs in tussock and hummock grasslands (with a preference for tussock). Occasionally they occur on pastoral and cropping land and near dams. They breed on bare ground on low sandy ridges or stony rises between grassland and shrubland cover.	**Absent** No tussock and hummock grasslands in study area.	**Unlikely-** Suitable habitat not present

[4] Information sourced from species profiles on NSW OEH's threatened species database or the Australian Government's *Species Profiles and Threats* database (SPRAT) unless otherwise stated.

OEH threatened species database: http://www.threatenedspecies.environment.nsw.gov.au/index.aspx
SPRAT: http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl

Species and Status	Description of habitat[4]	Presence of habitat	Likelihood of occurrence
Artamus cyanopterus cyanopterus **Dusky Woodswallow** **BC – V**	The dusky woodswallow are widespread in eastern, southern and south western Australia. The species occurs throughout most of New South Wales, but is sparsely scattered in, or largely absent from, much of the upper western region. Most breeding activity occurs on the western slopes of the Great Dividing Range. The species primarily inhabit dry, open eucalypt forests and woodlands, including mallee associations, with an open or sparse understorey of eucalypt saplings, acacias and other shrubs, and ground-cover of grasses or sedges and fallen woody debris. It has also been recorded in shrublands, heathlands and very occasionally in moist forest or rainforest. Also found in farmland, usually at the edges of forest or woodland. Most breeding activity occurs on the western slopes of the Great Dividing Range.	**Present** Open Eucalypt woodland within the study area.	**Possible** Suitable habitat present within proposal area. This species has been recorded within the locality.
Botaurus poiciloptilus **Australasian Bittern** **EPBC – E** **BC - E**	In NSW, this species occurs along the coast and is frequently recorded in the Murray-Darling Basin, notably in floodplain wetlands of the Murrumbidgee, Lachlan, Macquarie and Gwydir Rivers. Favours permanent freshwater wetlands with tall, dense vegetation, particularly bullrushes (Typha spp.) and spikerushes (Eleocharis spp.). Nests are built in secluded places in densely-vegetated wetlands on a platform of reeds.	**Absent** No permanent freshwater wetlands with tall, dense vegetation in study area.	**Unlikely-** Suitable habitat not present
Burhinus grallarius **Bush Stone-curlew** **BC - E**	The Bush Stone-curlew is found throughout Australia except for the central southern coast and inland, the far south-east corner, and Tasmania. Inhabits open forests and woodlands with a sparse grassy groundlayer and fallen timber. Largely nocturnal, being especially active on moonlit nights. Feed on insects and small vertebrates, such as frogs, lizards and snakes. Nest on the ground in a scrape or small bare patch. Two eggs are laid in spring and early summer.	**Present** Open Eucalypt woodland with a sparse grassy groundlayer in study area.	**Unlikely** Limited fallen timber present in the proposal area

Species and Status	Description of habitat[4]	Presence of habitat	Likelihood of occurrence
Calidris ferruginea **Curlew Sandpiper** **EPBC - CE**	Curlew Sandpipers mainly occur on intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms. They are also recorded inland, though less often, including around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand. They occur in both fresh and brackish waters. Curlew Sandpipers generally roost on bare dry shingle, shell or sand beaches, sandspits and islets in or around coastal or near-coastal lagoons and other wetlands, occasionally roosting in dunes during very high tides and sometimes in saltmarsh.	**Absent** No ephemeral and permanent lakes, dams, waterholes and bore drains with mudflats occur within the study area.	**Unlikely-** Suitable habitat not present
Callocephalon fimbriatum **Gang-gang Cockatoo** **BC-V**	In NSW, this species is found from the south-eastern coast to the Hunter region, and west to the Central tablelands and south-west slopes. It is common in the ACT. During spring and summer, it is found in tall mountain forests and woodlands. There is a preference for heavily timbered and mature wet sclerophyll forests. During autumn and winter, species move to lower altitudes and occupy drier, more open eucalypt forests and woodlands, particularly box-gum and box-ironbark assemblages, or in dry forest in coastal areas. It may also occur in sub-alpine Snow Gum woodland and temperate rainforests. Prefers old growth forest and woodlands that have eucalypt hollows (10cm in diameter or larger and 9m above the ground).	**Absent** No old growth forest with suitable hollows within the study area.	**Unlikely-** Suitable habitat not present. No records within 10 km of the proposal area.
Calyptorhynchus lathami **Glossy Black-Cockatoo** **BC-V**	This species is widespread throughout eastern to central NSW. They occur in open forest and woodlands on the coast and the Great Dividing Range. Clack Sheoak and Forest Sheoak are important food sources. Inland birds feed on other Sheoaks including Drooping Sheoak, Allocasuaraina diminuta, A. gymnathera and Belah. They are dependent on large hollow-bearing eucalpyts for nesting. Where food sources are appropriate, they inhabit dry and wet sclerophyll, forests, forested wetlands, grassy woodlands, freshwater wetlands, heathlands, rainforests and semi-arid woodlands.	**Absent** No Sheoak and Forest Sheoak within the study area.	**Unlikely-** Suitable habitat not present. No records within 10 km of the proposal area.

Species and Status	Description of habitat[4]	Presence of habitat	Likelihood of occurrence
Certhionyx variegatrus **Pied Honeyeater** **BC - V**	Inhabits wattle shrub, primarily Mulga (Acacia aneura), mallee, spinifex and eucalypt woodlands, usually when shrubs are flowering; feeds on nectar, predominantly from various species of emu-bushes (Eremophila spp.); also from mistletoes and various other shrubs (e.g. Grevillea spp.); also eats saltbush fruit, berries, seed, flowers and insects.	**Absent** No wattle scrub, malle, spinifex or shrubby woodlands in the study area.	**Unlikely-** Suitable habitat not present. No records within 10 km of the proposal area.
Chthonicola sagittate **Speckled Warbler** **BC - V**	Lives in a wide range of Eucalyptus dominated communities that have a grassy understorey, often on rocky ridges or in gullies. Typical habitat would include scattered native tussock grasses, a sparse shrub layer, some eucalypt regrowth and an open canopy. Large, relatively undisturbed remnants are required for the species to persist in an area.	**Absent** No rocky ridges or gullies in the study area.	**Unlikely-** Suitable habitat not present. No records within 10 km of the proposal area.
Circus assimilis **Spotted Harrier** **BC – V**	Occurs in grassy open woodland including Acacia and mallee remnants, inland riparian woodland, grassland and shrub steppe. It is found most commonly in native grassland, but also occurs in agricultural land, foraging over open habitats including edges of inland wetlands. Builds a stick nest in a tree and lays eggs in spring (or sometimes autumn), with young remaining in the nest for several months.	**Present** Eucalypt community in agricultural land in study area.	**Possible-** Species may occur in the study area.
Climacteris picumnus victoriae **Brown Tree Creeper (Eastern Species)** **BC – V**	Found in eucalypt woodlands (including Box-Gum Woodland) and dry open forest of the inland slopes and plains inland of the Great Dividing Range; mainly inhabits woodlands dominated by stringybarks or other rough-barked eucalypts, usually with an open grassy understorey, sometimes with one or more shrub species; also found in mallee and River Red Gum (Eucalyptus camaldulensis) Forest bordering wetlands with an open understorey of acacias, saltbush, lignum, cumbungi and grasses; usually not found in woodlands with a dense shrub layer; fallen timber is an important habitat component for foraging; also recorded, though less commonly, in similar woodland habitats on the coastal ranges and plains. Hollows in standing dead or live trees and tree stumps are essential for nesting.	**Present** Open Eucalypt woodland within the study area.	**Possible** Suitable habitat present in study area.

Species and Status	Description of habitat[4]	Presence of habitat	Likelihood of occurrence
Daphoenositta chrysoptera **Varied Sittella** **BC - V**	Inhabits eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and Acacia woodland. Builds a cup-shaped nest of plant fibres and cobwebs in an upright tree fork high in the living tree canopy, and often re-uses the same fork or tree in successive years.	**Present** Eucalypt community with rough and smooth barked gums in study area.	**Possible-** Species may occur in the proposal area.
Ephippiorhynchus asiaticus **Black -necked Stork** **BC - E**	Floodplain wetlands (swamps, billabongs, watercourses and dams) of the major coastal rivers are the key habitat in NSW for the Black-necked Stork. Secondary habitat includes minor floodplains, coastal sandplain wetlands and estuaries.	**Absent** Study area does not occur within the coastal area.	**Unlikely-** Suitable habitat not present. No records within 10 km of the proposal area.
Epthianura albifrons **White-fronted Chat** **BC-V**	This species is widespread throughout NSW, mostly in the southern end of the state. Typically found in temperate to arid climates and occasionally sub-tropical areas. Occurs in foothills and lowlands up to 1000m above sea level. It is found in saltmarsh vegetation, open grasslands and sometimes in low shrubs adjacent to wetland areas. Nests are open cut and built in low vegetation (23cm-2.5m above the ground).	**Absent** No saltmarsh vegetation, open grasslands or low shrubs adjacent to wetland areas in study area.	**Unlikely-** Suitable habitat not present. No records within 10 km of the proposal area.
Falco hypoleucos **Grey Falcon** **BC - E**	Usually restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions, although it is occasionally found in open woodlands near the coast. Usually restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions, although it is occasionally found in open woodlands near the coast.	**Present** Wooded watercourses in study area.	**Possible-** Species may occur in study area
Falco subniger **Black Falcon** **BC-V**	The black falcon is widely distributed in NSW, mostly occurring inland. They occur in woodland, shrubland and grassland in the arid and semi-arid zones. They use wetlands and streams for hunting. They also use remnant vegetation occasionally.	**Present** Wooded watercourses in study area.	**Possible** Species may occur in the study area

Species and Status	Description of habitat[4]	Presence of habitat	Likelihood of occurrence
Glossopsitta porphyrocephala **Purple-crowned Lorikeet** **BC - V**	Found in open forests and woodlands, particularly where there are large flowering eucalypts. Also recorded from mallee habitats. Breeds away from feeding areas, utilising hollow branches or holes in trees. Also roosts in dense vegetation up to several kilometres away from feeding areas.	**Present** Study area does contain Large flowering Eucalypts in study area.	**Possible** Species may occur in the study area
Glossopsitta pusilla **Little Lorikeet** **BC-V**	This species is found along the coast and Great Divide regions of eastern Australia and is found as far west as Dubbo and Albury. Primarily found in the canopy of open *Eucaluptus* forest and woodland and also found with *Angophora, Melaleuca* and other tree species. They utilise paddock and other remnant trees as a supplementary food source. Roost in treetops. Nests are in hollows in the limb or trunk of smooth barked Eucalypts. The entrance is approximately 3cm and 2-15m above the ground.	**Present** Open Eucalypt woodland with suitable hollows in study area.	**Possible** Species may occur in the study area
Grantiella picta **Painted Honeyeater** **BC – V** **EPBC – V**	Inhabits Boree/ Weeping Myall (Acacia pendula), Brigalow (A. harpophylla) and Box-Gum Woodlands and Box-Ironbark Forests. A specialist feeder on the fruits of mistletoes growing on woodland eucalypts and acacias. Prefers mistletoes of the genus Amyema.	**Present** Box-Gum woodland in study area.	**Possible** Species may occur in the study area
Grus rubicunda **Brolga** **BC-V**	Brolgas feed in dry grassland and ploughed paddocks and are depended on wetlands, particularly shallow swamps. They are found in arid shrublands, forested wetlands, freshwater wetlands, grasslands, saline wetlands and semi-arid woodlands (grassy and shrub formation)	**Absent** No permanent wetlands in study area.	**Unlikely-** Suitable habitat not present. No records within 10 km of the proposal area.

Species and Status	Description of habitat[4]	Presence of habitat	Likelihood of occurrence
Haliaceetus leucogaster **White-bellied Sea-Eagle** **BC - V**	Habitats are characterised by the presence of large areas of open water including larger rivers, swamps, lakes, and the sea. Occurs at sites near the sea or sea-shore, such as around bays and inlets, beaches, reefs, lagoons, estuaries and mangroves; and at, or in the vicinity of freshwater swamps, lakes, reservoirs, billabongs and saltmarsh. Terrestrial habitats include coastal dunes, tidal flats, grassland, heathland, woodland, and forest (including rainforest). Breeding habitat consists of mature tall open forest, open forest, tall woodland, and swamp sclerophyll forest close to foraging habitat. Nest trees are typically large emergent eucalypts and often have emergent dead branches or large dead trees nearby.	**Absent** No large areas of open water in study area.	**Unlikely-** Suitable habitat not present. Species may fly over the study area. No records within 10 km of the proposal area.
Hamirostra melanosternon **Black-breasted Buzzard** **BC - V**	Lives in a range of inland habitats, especially along timbered watercourses which is the preferred breeding habitat. Also hunts over grasslands and sparsely timbered woodlands. Breeds from August to October near water in a tall tree.	**Present** Timbered watercourses in study area.	**Unlikely-** No records within 10 km of the proposal area.
Hieraaetus morphnoides **Little Eagle** **BC - V**	The Little Eagle occurs as a single population throughout NSW. It occupies open eucalypt forest, woodland or open woodland. Sheoak or acacia woodlands and riparian woodlands of interior NSW are also used. Nests in tall living trees within a remnant patch, where pairs build a large stick nest in winter.	**Present** Open eucalypt woodland within the locality.	**Possible** This species has been recorded within the locality. No stick nests recorded during site survey., however species may be a vagrant visitor.
Ixobrychus flavicollis **Black Bittern** **BC - V**	Inhabits both terrestrial and estuarine wetlands, generally in areas of permanent water and dense vegetation. Where permanent water is present, the species may occur in flooded grassland, forest, woodland, rainforest and mangroves. During the day, roosts in trees or on the ground amongst dense reeds.	**Absent** No permanent wetlands in study area.	**Unlikely-** Suitable habitat not present. No records within 10 km of the proposal area.

Species and Status	Description of habitat[4]	Presence of habitat	Likelihood of occurrence
Leipoa ocellate **Malleefowl** **EPBC-V**	Occurs in NSW in the south west centred on Mallee Cliffs NP and extending east to near Balranald and scattered records as far north as Mungo NP. West of the Darling River a population also occurs in the Scotia mallee including Tarawi NR and Scotia Sanctuary and is part of a larger population north of the Murray River in South Australia. Further east, a population continues to persist in the Goonoo forest near Dubbo. Outside these areas, occasional records have been made in the Pilliga forests (most recently 1999), around Cobar (1991) and Goulburn River NP (1989) though the extent and status of populations in these areas are unknown. Predominantly inhabit mallee communities, preferring the tall, dense and floristically-rich mallee found in higher rainfall (300 - 450 mm mean annual rainfall) areas. Utilises mallee with a spinifex understorey, but usually at lower densities than in areas with a shrub understorey. Less frequently found in other eucalypt woodlands, such as Inland Grey Box, Ironbark or Bimble Box Woodlands with thick understorey, or in other woodlands such dominated by Mulga or native Cypress Pine species. Prefers areas of light sandy to sandy loam soils and habitats with a dense but discontinuous canopy and dense and diverse shrub and herb layers. Mainly forage in open areas on seeds of acacias and other native shrubs (Cassia, Beyeria, Bossiaea), buds, flowers and fruits of herbs and various shrubs, insects (cockroaches, ants, soil invertebrates), and cereals if available. Incubate eggs in large mounds that contain considerable volumes of sandy soil.	**Absent** Box Gum woodland occurs in study area, however the site is outside the known distribution of this species.	**Unlikely-** Suitable habitat not present. No records within 10 km of the proposal area.
Limosa limosa **Black-tailed Godwit** **BC - V**	Primarily a coastal species. Usually found in sheltered bays, estuaries and lagoons with large intertidal mudflats and/or sandflats. Further inland, it can also be found on mudflats and in water less than 10 cm deep, around muddy lakes and swamps. Roosts and loafs on low banks of mud, sand and shell bars.	**Absent** No mudflats, muddy lakes or swamps in study area.	**Unlikely-** Suitable habitat not present. No records within 10 km of the proposal area.

Species and Status	Description of habitat[4]	Presence of habitat	Likelihood of occurrence
Lophoictinia isura **Square-tailed Kite** **BC - V**	Found in a variety of timbered habitats including dry woodlands and open forests. Particularly prefers timbered watercourses. In arid north-western NSW, has been observed in stony country with a ground cover of chenopods and grasses, open acacia scrub and patches of low open eucalypt woodland. Breeding is from July to February, with nest sites generally located along or near watercourses, in a fork or on large horizontal limbs.	**Present** Open eucalypt woodland with timbered watercourse in study area.	**Possible** Species may be a vagrant visitor in the study area
Lophochroa leadbeateri **Major Mitchell's Cockatoo** **BC-V**	In NSW this species occurs commonly as far east as Bourke and Griffith and is scattered further east than that. They are found in treed and treeless inland habitats and are always close to water. Nest in tree hollows in the latter half of the year. Nests are at least 1km apart. They are found in arid shrublands, dry sclerophyll forests, forested woodlands, grasslands and semi-arid woodlands.	**Present** Open eucalypt woodland with timbered watercourse in study area.	**Unlikely** Suitable habitat present, however, there are no records within 10 km of the proposal area. Species may fly over the study area.
Lathamus discolour **Swift Parrot** **BC - E** **EPBC - CE**	Occur in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations. Favoured feed trees include winter flowering species such as Swamp Mahogany *Eucalyptus robusta*, Spotted Gum *Corymbia maculata*, Red Bloodwood *C. gummifera*, Mugga Ironbark *E. sideroxylon*, and White Box *E. albens*. Commonly used lerp infested trees include Grey Box *E. microcarpa*, Grey Box *E. moluccana* and Blackbutt *E. pilularis*. They breed in Tasmania from September to January, nesting in old trees with hollows and feeding in forests dominated by Tasmanian Blue Gum Eucalyptus globulus.	**Present** Open Eucalypt woodland within the study area.	**Possible** Suitable habitat is present within the development site and species has been recorded within the locality.
Melanodryas cucullate cucullate **Hooded Robin** **BC -V**	Prefers lightly wooded country, usually open eucalypt woodland, acacia scrub and mallee, often in or near clearings or open areas. Requires structurally diverse habitats featuring mature eucalypts, saplings, some small shrubs and a ground layer of moderately tall native grasses. Often perches on low dead stumps and fallen timber or on low-hanging branches.	**Absent** Open eucalypt woodland present in study area, however it lacks structural diversity.	**Unlikely** Suitable habitat not present. No records within 10 km of the proposal area.

Species and Status	Description of habitat[4]	Presence of habitat	Likelihood of occurrence
Melithreptus gularis gularis **Black-chinned Honeyeater** **BC - V**	Occupies mostly upper levels of drier open forests or woodlands dominated by box and ironbark eucalypts, especially Mugga Ironbark (Eucalyptus sideroxylon), White Box (E. albens), Inland Grey Box (E. microcarpa), Yellow Box (E. melliodora), Blakely's Red Gum (E. blakelyi) and Forest Red Gum (E. tereticornis). Also inhabits open forests of smooth-barked gums, stringybarks, ironbarks, river sheoaks (nesting habitat) and tea-trees.	**Present** Open eucalypt woodland with characteristic species in study area.	**Possible** Species may occur in the study area
Neophema pulchella **Turquoise Parrot** **BC - V**	Lives on the edges of eucalypt woodland adjoining clearings, timbered ridges and creeks in farmland. Prefers to feed in the shade of a tree and spends most of the day on the ground searching for the seeds or grasses and herbaceous plants, or browsing on vegetable matter. Nests in tree hollows, logs or posts, from August to December. The species breeds and hunts in open or closed sclerophyll forest or woodlands and occasionally hunts in open habitats. It roosts by day in dense vegetation comprising species such as Turpentine Syncarpia glomulifera, Black She-oak Allocasuarina littoralis, Blackwood Acacia melanoxylon, Rough-barked Apple Angophora floribunda, Cherry Ballart Exocarpus cupressiformis and a number of eucalypt species.	**Present** Development site adjoins suitable eucalypt woodland	**Possible** Suitable habitat is present within the development site. This species has been recorded within the locality.
Ninnox connivens **Barking Owl** **BC - V**	Inhabits woodland and open forest, including fragmented remnants and partly cleared farmland. It is flexible in its habitat use, and hunting can extend in to closed forest and more open areas. Sometimes able to successfully breed along timbered watercourses in heavily cleared habitats (e.g. western NSW) due to the higher density of prey on these fertile riparian soils. Roost in shaded portions of tree canopies, including tall midstorey trees with dense foliage such as *Acacia* and *Casuarina* species. Requires very large permanent territories in most habitats due to sparse prey densities. Eggs are laid in hollows of large, old trees. Living eucalypts are preferred though dead trees are also used.	**Present** Open eucalypt woodland on cleared farmland in study area.	**Unlikely** Suitable habitat present, however, there are no records within 10 km of the proposal area.

Species and Status	Description of habitat[4]	Presence of habitat	Likelihood of occurrence
Ninox strenua **Powerful Owl** **BC - V**	The Powerful Owl inhabits a range of vegetation types, from woodland and open sclerophyll forest to tall open wet forest and rainforest. The Powerful Owl requires large tracts of forest or woodland habitat but can occur in fragmented landscapes. The species breeds and hunts in open or closed sclerophyll forest or woodlands and occasionally hunts in open habitats. It roosts by day in dense vegetation comprising species such as Turpentine Syncarpia glomulifera, Black She-oak Allocasuarina littoralis, Blackwood Acacia melanoxylon, Rough-barked Apple Angophora floribunda, Cherry Ballart Exocarpus cupressiformis and a number of eucalypt species. Nests in large tree hollows (at least 0.5 m deep), in large eucalypts (diameter at breast height of 80-240 cm) that are at least 150 years old.	**Present** Open eucalypt woodland in study area.	**Unlikely** Suitable habitat present, however, there are no records within 10 km of the proposal area.
Numenius madagascariensis **Eastern Curlew, Far Eastern Curlew** **EPBC - CE**	The Eastern Curlew is most commonly associated with sheltered coasts, especially estuaries, bays, harbours, inlets and coastal lagoons, with large intertidal mudflats or sandflats, often with beds of seagrass. The Eastern Curlew mainly forages on soft sheltered intertidal sandflats or mudflats, open and without vegetation or covered with seagrass, often near mangroves, on saltflats and in saltmarsh, rockpools and among rubble on coral reefs, and on ocean beaches near the tideline. The Eastern Curlew roosts on sandy spits and islets, especially on dry beach sand near the high-water mark, and among coastal vegetation including low saltmarsh or mangroves. It occasionally roosts on reef-flats, in the shallow water of lagoons and other near-coastal wetlands.	**Absent** No coastal sandflats or mudflats within the study area.	**Unlikely** Suitable habitat not present.
Oxyura australis **Blue-billed Duck** **BC -V**	The Blue-billed Duck prefers deep water in large permanent wetlands and swamps with dense aquatic vegetation. The species is completely aquatic, swimming low in the water along the edge of dense cover. Will feed by day far from the shore, particularly if dense cover is available in the central parts of the wetland. They feed on the bottom of swamps eating seeds, buds, stems, leaves, fruit and small aquatic insects such as the larvae of midges, caddisflies and dragonflies. Usually nest solitarily in Cumbungi over deep water between September and February. They will also nest in trampled vegetation in Lignum, sedges or Spike-rushes.	**Absent** No permanent areas of deep water with dense aquatic vegetation within the study area.	**Unlikely** Suitable habitat not present. No records within 10 km of the proposal area.

Species and Status	Description of habitat[4]	Presence of habitat	Likelihood of occurrence
Pachycephala inornata **Gilberts Whistler** **BC - V**	The Gilbert's Whistler occurs in a range of habitats within NSW, though the shared feature appears to be a dense shrub layer. It is widely recorded in mallee shrublands, but also occurs in box-ironbark woodlands, Cypress Pine and Belah woodlands and River Red Gum forests, though at this stage it is only known to use this habitat along the Murray, Edwards and Wakool Rivers. Within the mallee the species is often found in association with an understorey of spinifex and low shrubs including wattles, hakeas, sennas and hop-bushes. In woodland habitats, the understorey comprises dense patches of shrubs, particularly thickets of regrowth Callitris pine. Parasitic 'cherries' (Exocarpus species) appear to be an important habitat component in Belah and Red Gum communities, though in the latter case other dense shrubs, such as Lignum and wattles, are also utilised.	**Absent** No woodland with suitable shrub layer within the study area.	**Unlikely** Suitable habitat not present. No records within 10 km of the proposal area.
Pandion cristatus **Eastern Osprey** **BC - V**	Favour coastal areas, especially the mouths of large rivers, lagoons and lakes. Feed on fish over clear, open water. Nests are made high up in dead trees or in dead crowns of live trees, usually within one kilometre of the sea.	**Absent** Study area does not occur on the coast..	**Unlikely** Suitable habitat not present. No records within 10 km of the proposal area.

Species and Status	Description of habitat[4]	Presence of habitat	Likelihood of occurrence
Petroica boodang **Scarlet Robin** **BC – V**	The Scarlet Robin is found from SE Queensland to SE South Australia and also in Tasmania and SW Western Australia. In NSW, it occurs from the coast to the inland slopes. After breeding, some Scarlet Robins disperse to the lower valleys and plains of the tablelands and slopes. The Scarlet Robin lives in dry eucalypt forests and woodlands. The understorey is usually open and grassy with few scattered shrubs. This species lives in both mature and regrowth vegetation. It occasionally occurs in mallee or wet forest communities, or in wetlands and tea-tree swamps. Scarlet Robin habitat usually contains abundant logs and fallen timber: these are important components of its habitat. The Scarlet Robin breeds on ridges, hills and foothills of the western slopes, the Great Dividing Range and eastern coastal regions; this species is occasionally found up to 1000 metres in altitude. The Scarlet Robin is primarily a resident in forests and woodlands, but some adults and young birds disperse to more open habitats after breeding. In autumn and winter many Scarlet Robins live in open grassy woodlands, and grasslands or grazed paddocks with scattered trees.	**Absent** Riverine woodland present in study area, however the site lacks fallen timber.	**Unlikely** Suitable habitat not present. No records within 10 km of the proposal area.
Petroica phoenicea **Flame Robin** **BC – V**	The Flame Robin is endemic to SE Australia, and ranges from near the Queensland border to SE South Australia and also in Tasmania. In NSW, it breeds in upland areas and in winter, many birds move to the inland slopes and plains. It is likely that there are two separate populations in NSW, one in the Northern Tablelands, and another ranging from the Central to Southern Tablelands. Breeds in upland tall moist eucalypt forests and woodlands, often on ridges and slopes. Prefers clearings or areas with open understoreys. The ground layer of the breeding habitat is dominated by native grasses and the shrub layer may be either sparse or dense. In winter, birds migrate to drier more open habitats in the lowlands (i.e. valleys below the ranges, and to the western slopes and plains).	**Present** Eucalypt woodland present in study area.	**Possible** Species may occur in the study area.

Species and Status	Description of habitat[4]	Presence of habitat	Likelihood of occurrence
Petroica rodinogaster **Pink Robin** **BC - V**	Inhabits rainforest and tall, open eucalypt forest, particularly in densely vegetated gullies. Nests are situated in an upright or oblique fork, from 30cm to 6m above the ground, in deep undergrowth.	**Absent** Eucalypt woodland present in study area, however the site has no densely vegetated gullies.	**Unlikely** Suitable habitat not present. No records within 10 km of the proposal area.
Polytelis swainsonii **Superb Parrot** **EPBC – V, BC - V**	Inhabit Box-Gum, Box-Cypress-pine and Boree Woodlands and River Red Gum Forest. In the Riverina the birds nest in the hollows of large trees (dead or alive) mainly in tall riparian River Red Gum Forest or Woodland. On the South West Slopes nest trees can be in open Box-Gum Woodland or isolated paddock trees. Species known to be used are Blakely's Red Gum, Yellow Box, Apple Box and Red Box.	**Present** Open grassland with scattered eucalypts within the development site.	**Possible** Suitable habitat is present within the development site and this species has been recorded within close vicinity to the development site.

Species and Status	Description of habitat[4]	Presence of habitat	Likelihood of occurrence
Pomatostomus temporalis temporalis **Grey-crowned Babbler (eastern subspecies)** **BC-V**	The eastern subspecies (*temporalis)* occurs from Cape York south through Queensland, NSW and Victoria and formerly to the south east of South Australia. In NSW, the eastern sub-species occurs on the western slopes of the Great Dividing Range, and on the western plains reaching as far as Louth and Balranald. It also occurs in woodlands in the Hunter Valley and in several locations on the north coast of NSW. It may be extinct in the southern, central and New England tablelands. Inhabits open Box-Gum Woodlands on the slopes, and Box-Cypress-pine and open Box Woodlands on alluvial plains. Birds are generally unable to cross large open areas. Feed on invertebrates, either by foraging on the trunks and branches of eucalypts and other woodland trees or on the ground, digging and probing amongst litter and tussock grasses. Build and maintain several conspicuous, dome-shaped stick nests about the size of a football. A nest is used as a dormitory for roosting each night. Nests are usually located in shrubs or sapling eucalypts, although they may be built in the outermost leaves of low branches of large eucalypts. Nests are maintained year round, and old nests are often dismantled to build new ones. Breed between July and February.	**Present** Box Gum woodland within the study area.	**Possible** Suitable habitat present.
Rostratula australis **Australian Painted Snipe** **EPBC - E**	They feed in shallow water or at the waters' edge and on mudflats. Most records of Australian Painted Snipe are from temporary or infrequently filled freshwater wetlands and although they have occurred at many sites. Primarily occurs along the east coast from north Queensland (excluding Cape York) to the Eyre Peninsula in South Australia, including the majority of Victoria and NSW. In NSW, this species has been recorded at the Paroo wetlands, Lake Cowell, Macquarie Marshes and Hexham Swamp. Most common in the Murray-Darling Basin. Inhabits inland and coastal shallow freshwater wetlands. The species occurs in both ephemeral and permanent wetlands, particularly where there is a cover of vegetation, including grasses, Lignum and Samphire. Individuals have also been known to use artificial habitats, such as sewage ponds, dams and waterlogged grassland. Nests on the ground amongst tall vegetation, such as grass tussocks or reeds.	**Absent** No vegetated wetlands, ponds or dams within the proposal site.	**Unlikely** No suitable habitat is present within the proposal site.

Species and Status	Description of habitat[4]	Presence of habitat	Likelihood of occurrence
Stagonopleura guttata **Diamond Firetail** **BC – V**	The Diamond Firetail is widely distributed in NSW, with a concentration of records from the Northern, Central and Southern Tablelands, the Northern, Central and South Western Slopes and the North West Plains and Riverina. Not commonly found in coastal districts, though there are records from near Sydney, the Hunter Valley and the Bega Valley. This species has a scattered distribution over the rest of NSW. Also found in the Australian Capital Territory, Queensland, Victoria and South Australia. Groups separate into small colonies to breed, between August and January. Found in grassy eucalypt woodlands, including Box-Gum Woodlands and Snow Gum Eucalyptus pauciflora Woodlands. Also occurs in open forest, mallee, Natural Temperate Grassland, and in secondary grassland derived from other communities. Often found in riparian areas (rivers and creeks), and sometimes in lightly wooded farmland. Feeds exclusively on the ground, on ripe and partly-ripe grass and herb seeds and green leaves, and on insects (especially in the breeding season).	**Present** Box Gum woodland present in study area.	**Possible** Species may occur in the study area.
Stictonetta naevosa **Freckled Duck** **BC-V**	This species breeds in large temporary swamps created by floods in the Bulloo and Lake Eyre basins and the Murray-Darling system. It typically occurs in south-eastern and south-western Australia but disperses during drought. In these times it can occur in coastal NSW and Victoria. They prefer permanent freshwater swamps and creeks with heavy growth of Cumbungi, Lignum or Tea-tree. When these areas are dry, the move to other waters such as lakes, reservoirs, farm dams and sewage ponds. Nests are usually found in dense vegetation at or near water level. They usually breed between October and November, but can also at other times.	**Absent** No permanent freshwater swamps and creeks with heavy growth of Cumbungi, Lignum or Tea-tree present in study area.	**Unlikely** Suitable habitat not present No records within 10 km of the proposal area.

Species and Status	Description of habitat[4]	Presence of habitat	Likelihood of occurrence
Tyto novaehollandiae **Masked Owl** **BC – V**	Extends from the coast where it is most abundant to the western plains. Lives in dry eucalypt forests and woodlands from sea level to 1100 m. Habitat for this species is also widespread throughout the dry eucalypt forests of the tablelands, western slopes and the undulating wet-dry forests of the coast. Optimal habitat includes an open understorey and a mosaic of sparse (grassy) and dense (shrubby) ground cover on gentle terrain. Roosts in hollows in live or occasionally dead eucalypts; dense foliage in gullies; and caves. Nest in old hollow eucalypts, live or dead, in a variety of topographic positions, with hollows greater than 40 cm wide and greater than 100 cm deep. Hollow entrances are at least 3 m above ground, in trees of at least 90 cm diameter at breast height. A specialist predator of terrestrial mammals, particularly native rodents. Home range has been estimated as 400-1000 ha according to habitat productivity.	**Absent** Habitat not structurally diverse in study area.	**Unlikely** Suitable habitat not present No records within 10 km of the proposal area.
Fish			
Galaxius rostratus **Flathead Galaxias** **CE EPBC** **CE FM**	Below 150 m in altitude. Billabongs, lakes, swamps, and rivers, with preference for still or slow-flowing waters.	**Absent** No permanent Billabongs, lakes, swamps, or rivers in study area.	**Unlikely-** Suitable habitat not present.
Maccullochella peelii **Murray Cod** **EPBC - V**	Found extensively throughout the Murray Darling Basin in the south-eastern region of Australia. Murray cod are able to live in a wide range of habitats from clear, rocky streams in the upper western slopes regions of New South Wales to the slow flowing, turbid rivers and billabongs of the western plains. Generally, they are found in waters up to 5m deep and in sheltered areas with cover from rocks, timber or overhanging banks. They typically spawn eggs onto firm substrates such as hollow logs, rocks, pipes and clay banks, from spring to early summer.	**Absent** No permanent deep streams in study area.	**Unlikely-** Suitable habitat not present.

Species and Status	Description of habitat[4]	Presence of habitat	Likelihood of occurrence
Macquaria australasica **Macquarie Perch** **EPBC - E**	They are found in the Murray-Darling Basin (particularly upstream reaches) of the Lachlan, Murrumbidgee and Murray rivers, and parts of south-eastern coastal NSW, including the Hawkesbury and Shoalhaven catchments. Macquarie perch are found in both river and lake habitats, especially the upper reaches of rivers and their tributaries. The species spawn in spring or summer in shallow upland streams or flowing parts of rivers where the eggs which settle among stones and gravel of the stream or river bed.	**Absent** No permanent streams in study area.	**Unlikely-** Suitable habitat not present.
Maccullochella macquariensis **Trout Cod** **EPBC - E**	Trout Cod tend to occupy areas which have lots of large in-stream woody debris or 'snags', which provide complex habitats for each stage of the species' life cycle.	**Absent** No permanent streams with large in-stream woody debris in study area.	**Unlikely-** Suitable habitat not present.
Mammals			
Chalinolobus dwyeri **Large-eared Pied Bat** **BC – V** **EPBC - V**	Roosts in caves (near their entrances), crevices in cliffs, old mine workings and in the disused, bottle-shaped mud nests of the Fairy Martin (Petrochelidon ariel), frequenting low to mid-elevation dry open forest and woodland close to these features. Found in well-timbered areas containing gullies.	**Absent** No caves, cliffs, old mine workings or fairy martin nests in study area.	**Unlikely-** Suitable habitat not present.
Chalinolobus picatus **Little Pied Bat** **BC – V**	Occurs in dry open forest, open woodland, mulga woodlands, chenopod shrublands, cypress pine forest and mallee and Bimbil box woodlands. Roosts in caves, rock outcrops, mine shafts, tunnels, tree hollows and buildings.	**Present** Open woodland with hollows in study area.	**Possible-** Suitable habitat present.

Species and Status	Description of habitat[4]	Presence of habitat	Likelihood of occurrence
Cercartetus nanus **Eastern Pygmy-possum** **BC - V**	Found in a broad range of habitats from rainforest through sclerophyll (including Box-Ironbark) forest and woodland to heath, but in most areas woodlands and heath appear to be preferred, except in north-eastern NSW where they are most frequently encountered in rainforest. Feeds largely on nectar and pollen collected from banksias, eucalypts and bottlebrushes. Shelters in tree hollows, rotten stumps, holes in the ground, abandoned bird-nests, Ringtail Possum (Pseudocheirus peregrinus) dreys or thickets of vegetation, (e.g. grass-tree skirts).	**Present** Open woodland with hollows in study area.	**Unlikely -** Suitable habitat present, however there are no records within 10 km of the proposal area.
Dasyurus maculatus **Spotted-tailed Quoll** **BC-V, EPBC-E**	In NSW, this species only known to occur in the east. It occupies a range of habitats including rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline. They use hollow-bearing trees, fallen logs, small caves, rock outcrops and rocky-cliff faces for dens. They use communal waste sites, which typically occur on flat rocks among boulder fields, rocky cliff-faces or along rocky stream beds or banks. They can be identified by characteristic twisted faeces.	**Present** Open woodland with hollows in study area.	**Unlikely -** Suitable habitat present, however there are no records within 10 km of the proposal area.
Falsistrellus tasmaniensis **Eastern False Pipistrelle** **BC-V**	It is found on the south-east coast and ranges of Australia. They prefer moist habitats with trees more than 20m tall. They prefer to roost in eucalypt hollows but have been found under loose bark on trees. They hibernate in winter, and females are pregnant during late spring to early summer. Found in dry sclerophyll forests, forested wetlands, freshwater wetlands, grassy woodlands, heathlands and rainforests.	**Present** Open woodland with hollows in study area.	**Possible-** Suitable habitat present.
Miniopterus schreibersii oceanensis **Eastern Bentwing – bat** **BC - V**	Caves are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures. Cold caves are used for hibernation in southern Australia. Hunt in forested areas, catching moths and other flying insects above the tree tops.	**Present** Open woodland with hollows and man-made structures in study area.	**Possible-** Suitable habitat present.

Species and Status	Description of habitat[4]	Presence of habitat	Likelihood of occurrence
Myotis Macropus **Southern Myotis** **BC - V**	Generally roost in groups of 10 - 15 close to water in caves, mine shafts, hollow-bearing trees, storm water channels, buildings, under bridges and in dense foliage. Forage over streams and pools catching insects and small fish.	**Present** No caves, mine shafts, suitable hollow-bearing trees, storm water channels, or bridges with dense foliage. within the development site. However, there is building and other man-made structures	**Possible** This species may use existing houses as roosting sites. This species has been recorded within the locality.
Nyctophilus corbeni **Corben's Long-eared Bat, South-eastern Long-eared Bat** **BC - V** **EPBC - V**	Inhabits a variety of vegetation types, including mallee, bulloke Allocasuarina leuhmanni and box eucalypt dominated communities, but it is distinctly more common in box/ironbark/cypress-pine vegetation that occurs in a north-south belt along the western slopes and plains of NSW and southern Queensland. Roosts in tree hollows, crevices, and under loose bark.	**Present** Open Box Gum woodland with hollows in study area.	**Possible-** Suitable habitat present.
Petaurus australis **Yellow-bellied Glider** **BC - V**	Occur in tall mature eucalypt forest generally in areas with high rainfall and nutrient rich soils. Forest type preferences vary with latitude and elevation; mixed coastal forests to dry escarpment forests in the north; moist coastal gullies and creek flats to tall montane forests in the south. Roosts in hollows of large trees.	**Absent** No tall mature eucalypt forest in areas with high rainfall and nutrient rich soils in study area.	**Unlikely -** Suitable not habitat present. No records within 10 km of the proposal area.

Species and Status	Description of habitat[4]	Presence of habitat	Likelihood of occurrence
Petaurus norfolcensis **Squirrel Glider** **BC - endangered population**	Inhabits a wide range of open forest, woodland and riverine forest habitats. Utilise remnants of various sizes, including small remnants and even small stands of trees within Travelling Stock Reserves, roadside reserves or private land. Often utilise linear remnant vegetation along roadsides or rivers and streams. Eucalypt species known to provide suitable denning and foraging resources include (but are not restricted to): Blakely's Red Gum (Eucalyptus blakelyi), Grey Box (E. microcarpa), Red Box (E. polyanthemos), Mugga Ironbark (E. sideroxylon), River Red Gum (E. camaldulensis), White Box (E. albens) and Yellow Box (E. melliodora). require abundant tree hollows for refuge and nest sites, so are more likely to inhabit mature or old growth forest.	**Absent**. There is open eucalypt woodland within the development site, however it does not contain a diverse range of flora species and is a predominantly the would not facilitate movement required for this species.	**Unlikely** No suitable habitat present within the development site.
Petrogale penicillate **Brush-tailed Rock-wallaby** **BC-E, EPBC-V**	In NSW this species occurs from the Queensland boarder down to Shoalhaven and as far west as the Warrumbungle Ranges. They habitat rocky escarpments, outcrops and cliffs. They prefer complex structures with fissures, caves and ledges. They are primarily found in North and sometimes South facing slopes. They are heavily associated with sense arboreal cover (especially fig trees). They are found on slopes near dense rainforest, wet and dry sclerophyll forest, vine ticket and open forest.	**Absent** Caves and rocky hills within the development site.	**Unlikely** No suitable habitat is present within the development site.
Phascogale tapoatafa **Brush-tailed Phascogale** **BC-V**	This species is mainly found to the east of the Great Dividing Range, with occasional records to the west. They prefer dry sclerophyll open forest with sparse groundcover of herbs, grasses, shrubs or leaf litter. They are also found in heath, swamps, rainforest and wet sclerophyll forest. They nest and take shelter in tree hollows with entrances 2.5-4cm wide.	**Absent** Suitable habitat not present.	**Unlikely** Suitable habitat not present. No records within 10 km of the proposal area.
Phascolarctos cinereus ***Koala*** **BC - V** **EPBC - V**	In NSW it mainly occurs on the central and north coasts with some populations in the western region. The koala inhabits a range of eucalypt forest and woodland communities, including coastal forests, the woodlands of the tablelands and western slopes, and the riparian communities of the western plains.	**Absent** Open Eucalypt woodland present, however it does not contain primary feed tree species.	**Unlikely** Suitable habitat not present.

Species and Status	Description of habitat[4]	Presence of habitat	Likelihood of occurrence
Pteropus poliocephalus **Grey-headed Flying-fox** **BC – V** **EPBC - V**	Occur in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops. Roosting camps are generally located within 20 km of a regular food source and are commonly found in gullies, close to water, in vegetation with a dense canopy. Feed on the nectar and pollen of native trees, in particular Eucalyptus, Melaleuca and Banksia, and fruits of rainforest trees and vines.	**Present** Gullies close to water, with dense canopy vegetation on development site.	**Possible** Suitable habitat present. Species has been recorded within 10 km of the proposal area.
Saccolaimus flaviventris **Yellow-bellied Sheathtail-bat** **BC – V**	Roosts in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows. Forages in most habitats across its very wide range, with and without trees; appears to defend an aerial territory. Breeding has been recorded from December to mid-March.	**Present** Open woodland with small hollow bearing trees within the development site. There are also building and other man-made structures.	**Possible** This species may use the hollows on the hollow bearing trees on the developing site.
Amphibians			
Crinia sloanei **Sloane's Froglet** **BC-V**	This species is widely distributed in the floodplains of the Murray Darling Basin. It has been found in dry sclerophyll forests (shrub/grass formation), forested wetlands (Blakely's Red Gum x Dirty Gum, River Red Gum herbaceous, River Red Gum swampy woodland wetland), freshwater wetlands, grassy woodlands (floodplain transition woodlands) and water bodies such as rivers, lakes and streams.	**Absent** No suitable permanent wetlands within the study area.	**Unlikely** Suitable habitat not present. No records within 10 km of the proposal area.
Litoria booroolongensis **Booroolong frog** **BC – E** **EPBC - E**	Live along permanent streams with some fringing vegetation cover such as ferns, sedges or grasses. Adults occur on or near cobble banks and other rock structures within stream margins. Shelter under rocks or amongst vegetation near the ground on the stream edge. Eggs are laid in submerged rock crevices and tadpoles grow in slow-flowing connected or isolated pools.	**Absent** No permanent streams in the study area.	**Unlikely** Suitable habitat not present. No records within 10 km of the proposal area.

Species and Status	Description of habitat[4]	Presence of habitat	Likelihood of occurrence
Litoria raniformis **Growling Grass Frog, Southern Bell Frog** **BC - E** **EPBC - V**	Currently, the species is known to exist only in isolated populations in the Coleambally Irrigation Area, the Lowbidgee floodplain and around Lake Victoria. Usually found in or around permanent or ephemeral Black Box/Lignum/Nitre Goosefoot swamps, Lignum/Typha swamps and River Red Gum swamps or billabongs along floodplains and river valleys. They are also found in irrigated rice crops, particularly where there is no available natural habitat. During the breeding season animals are found floating amongst aquatic vegetation (especially cumbungi or Common Reeds) within or at the edge of slow-moving streams, marshes, lagoons, lakes, farm dams and rice crops. Outside the breeding season animals disperse away from the water and take shelter beneath ground debris such as fallen timber and bark, rocks, grass clumps and in deep soil cracks.	**Absent** No suitable permanent swamps within the study area.	**Unlikely** Suitable habitat not present. No records within 10 km of the proposal area.
Reptiles			
Aprasia parapulchella **Pink-tailed Worm-lizard, Pink-tailed Legless Lizard** **EPBC – V** **BC - V**	Inhabits sloping, open woodland areas with predominantly native grassy ground layers, particularly those dominated by Kangaroo Grass (*Themeda australis*). Sites are typically well-drained, with rocky outcrops or scattered, partially-buried rocks. Commonly found beneath small, partially-embedded rocks and appear to spend considerable time in burrows below these rocks.	**Absent** No open woodland dominated by native grasses with rocky outcrops or loose rocks in proposal area.	**Unlikely** No suitable habitat is present within the proposal area.
Delmar impar **Striped Legless Lizard** **BC – V** **EPBC - V**	Found mainly in Natural Temperate Grassland but has also been captured in grasslands that have a high exotic component. Also found in secondary grassland near Natural Temperate Grassland and occasionally in open Box-Gum Woodland. Habitat is where grassland is dominated by perennial, tussock-forming grasses such as Kangaroo Grass Themeda australis, spear-grasses Austrostipa spp. and poa tussocks Poa spp., and occasionally wallaby grasses Austrodanthonia spp. Sometimes found in grasslands with significant amounts of surface rocks, which are used for shelter.	**Absent** No open woodland dominated with suitable loose rocks in proposal area.	**Unlikely** No suitable habitat is present within the proposal area.

Species and Status	Description of habitat[4]	Presence of habitat	Likelihood of occurrence
Hoplocephalus bitorquatus **Pale-headed Snake** **BC -V**	Found mainly in dry eucalypt forests and woodlands, cypress forest and occasionally in rainforest or moist eucalypt forest. In drier environments, it appears to favour habitats close to riparian areas. Shelter during the day between loose bark and tree-trunks, or in hollow trunks and limbs of dead trees.	**Present** Riparian woodland with hollows in study area.	**Possible** Suitable habitat present.
Varanus rosenbergi **Rosenberg's Goanna** **BC - V**	Found in heath, open forest and woodland. Associated with termites, the mounds of which this species nests in; termite mounds are a critical habitat component. Individuals require large areas of habitat. Shelters in hollow logs, rock crevices and in burrows, which they may dig for themselves, or they may use other species' burrows, such as rabbit warrens.	**Absent** No termite mounds in study area.	**Unlikely** Suitable habitat not present.
Invertebrates			
Synemon plana **Golden Sun Moth** **BC-E, EPBC-CE**	This species is found between Queanbeyan, Gunning, Young and Tumut. It is found in Natural Temperate Grasslands and grassy Box-Gum Woodlands only when the groundcover is dominated by wallaby grasses. These areas are typically low and open. Bare ground between tussocks is important habitat.	**Absent** Study area outside species known distribution. Wallaby grass not present.	**Unlikely** Suitable habitat not present. No records within 10 km of the proposal area.
Migratory			

Species and Status	Description of habitat[4]	Presence of habitat	Likelihood of occurrence
Calidris ferruginea **Curlew Sandpiper** **EPBC – CE, M**	Curlew Sandpipers mainly occur on intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms. They are also recorded inland, though less often, including around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand. They occur in both fresh and brackish waters. Curlew Sandpipers generally roost on bare dry shingle, shell or sand beaches, sandspits and islets in or around coastal or near-coastal lagoons and other wetlands, occasionally roosting in dunes during very high tides and sometimes in saltmarsh. This species does not breed in Australia. This species forages mainly on invertebrates, including worms, molluscs, crustaceans, and insects, as well as seeds.	**Absent** No ephemeral and permanent lakes, dams, waterholes and bore drains with mudflats occur within the development area.	**Unlikely** Suitable habitat not present. No records within 10 km of the proposal area.
Calidris acuminate **Sharp-tailed Sandpiper** **EPBC - M**	The Sharp-tailed Sandpiper spends the non-breeding season in Australia with small numbers occurring regularly in New Zealand. In Australasia, the Sharp-tailed Sandpiper prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation. This includes lagoons, swamps, lakes and pools near the coast, and dams, waterholes, soaks, bore drains and bore swamps, saltpans and hypersaline saltlakes inland. They also occur in saltworks and sewage farms. They use flooded paddocks, sedgelands and other ephemeral wetlands, but leave when they dry. They use intertidal mudflats in sheltered bays, inlets, estuaries or seashores, and also swamps and creeks lined with mangroves. They tend to occupy coastal mudflats mainly after ephemeral terrestrial wetlands have dried out, moving back during the wet season. They may be attracted to mats of algae and water weed either floating or washed up around terrestrial wetlands, and coastal areas with much beachcast seaweed. Sometimes they occur on rocky shores and rarely on exposed reefs	**Absent** No ephemeral and permanent wetlands within the development area.	**Unlikely** Suitable habitat not present. No records within 10 km of the proposal area.

Species and Status	Description of habitat[4]	Presence of habitat	Likelihood of occurrence
Actitis hypoleucos **Common Sandpiper** **EPBC - M**	The species utilises a wide range of coastal wetlands and some inland wetlands, with varying levels of salinity, and is mostly found around muddy margins or rocky shores and rarely on mudflats. The Common Sandpiper has been recorded in estuaries and deltas of streams, as well as on banks farther upstream; around lakes, pools, billabongs, reservoirs, dams and claypans, and occasionally piers and jetties. The muddy margins utilised by the species are often narrow, and may be steep. The species is often associated with mangroves, and sometimes found in areas of mud littered with rocks or snags.	**Absent** No ephemeral and permanent wetlands with muddy flats occur within the development area.	**Unlikely** Suitable habitat not present. No records within 10 km of the proposal area..
Calidris melanotos **Pectoral Sandpiper** **EPBC - M**	The species is found at coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands. The species is usually found in coastal or near coastal habitat but occasionally found further inland. It prefers wetlands that have open fringing mudflats and low, emergent or fringing vegetation, such as grass or samphire. The species has also been recorded in swamp overgrown with lignum. They forage in shallow water or soft mud at the edge of wetlands (Higgins & Davies 1996).	**Absent** No ephemeral and permanent wetlands with muddy flats occur within the development area.	**Unlikely** Suitable habitat not present. No records within 10 km of the proposal area..
Apus pacificus **Fork-tailed Swift** **EPBC-M**	The Fork-tailed Swift is almost exclusively aerial, flying from less then 1 m to at least 300 m above ground and probably much higher. In Australia, they mostly occur over inland plains but sometimes above foothills or in coastal areas. They often occur over cliffs and beaches and also over islands and sometimes well out to sea. They also occur over settled areas, including towns, urban areas and cities. They mostly occur over dry or open habitats, including riparian woodland and tea-tree swamps, low scrub, heathland or saltmarsh. They are also found at treeless grassland and sandplains covered with spinifex, open farmland and inland and coastal sand-dunes.	**Present** Agricultural area with patches of open eucalypt woodland within the development area.	**Possible** Suitable habitat present. This species is likely to be a vagrant visitor and may fly over the site.

Species and Status	Description of habitat[4]	Presence of habitat	Likelihood of occurrence
Gallinago hardwickii **Latham's Snipe** **EPBC - M**	In Australia, Latham's Snipe occurs in permanent and ephemeral wetlands up to 2000 m above sea-level. They usually inhabit open, freshwater wetlands with low, dense vegetation. However, they can also occur in habitats with saline or brackish water, in modified or artificial habitats, and in habitats located close to humans or human activity	**Absent** No ephemeral and permanent wetlands occur within the development area.	**Unlikely** Suitable habitat not present. No records within 10 km of the proposal area.
Hirundapus caudacutus **White-throated Needletail** **EPBC - M**	Most White-throated Needletails spend the non-breeding season in Australasia, mainly in Australia, and occasionally in New Guinea and New Zealand. In Australia, the White-throated Needletail is almost exclusively aerial, from heights of less than 1 m up to more than 1000 m above the ground. Although they occur over most types of habitat, they are probably recorded most often above wooded areas, including open forest and rainforest, and may also fly between trees or in clearings, below the canopy, but they are less commonly recorded flying above woodland. They also commonly occur over heathland but less often over treeless areas, such as grassland or swamps.	**Present** Agricultural area with patches of open eucalypt woodland within the development area.	**Possible** Suitable habitat present. This species is likely to be a vagrant visitor and may fly over the site.
Motacilla flava **Yellow Wagtail** **EPBC - M**	The yellow wagtail occurs in a variety of damp or wet habitats with low vegetation, from rushy pastures, meadows, hay fields and marshes to damp steppe and grassy tundra. Outside of the breeding season it is also found in cultivated areas. The yellow wagtail typically forages in damp grassland and on relatively bare open ground at edges of rivers, lakes and wetlands, but also feeds in dry grassland and in fields of cereal crops. This species breeds in the northern hemisphere.	**Absent** No permanent damp habitat within the study area.	**Unlikley** Suitable habitat not present. No records within 10 km of the proposal area..
Myiaqgra cyanoleuca **Satin Flycatcher** **EPBC - M**	Satin Flycatchers inhabit heavily vegetated gullies in eucalypt-dominated forests and taller woodlands, and on migration, occur in coastal forests, woodlands, mangroves and drier woodlands and open forests. They also occur in eucalypt woodlands with open understorey and grass ground cover, and are generally absent from rainforest. In south-eastern Australia, they occur at elevations of up to 1400 m above sea level, and in the ACT, they occur mainly between 800 m above sea level and the tree line.	**Absent** No vegetated gullies within the development area.	**Unlikely** Suitable habitat not present. No records within 10 km of the proposal area..

Species and Status	Description of habitat[4]	Presence of habitat	Likelihood of occurrence
E BC = listed as Endangered under Schedule 1 of the NSW *Biodiversity Conservation Act 2016*			
E EPBC = listed as Endangered under the Commonwealth *Environment Protection & Biodiversity Conservation Act 1999.*			
V BC = listed as Vulnerable under Schedule 2 of the *Biodiversity Conservation Act 2016.*			
V EPBC = listed as Vulnerable under the Commonwealth *Environment Protection & Biodiversity Conservation Act 1999.*			
M EPBC = listed as Migratory under the Commonwealth *Environment Protection & Biodiversity Conservation Act 1999.*			

Office of Environment & Heritage
NSW GOVERNMENT

AHIMS Web Services (AWS)
Search Result

Purchase Order/Reference : 170514

Client Service ID : 477544

MJM Consulting Engineers

Level 1, 37 Johnston Street
Wagga Wagga New South Wales 2650
Attention: Jenna Amos

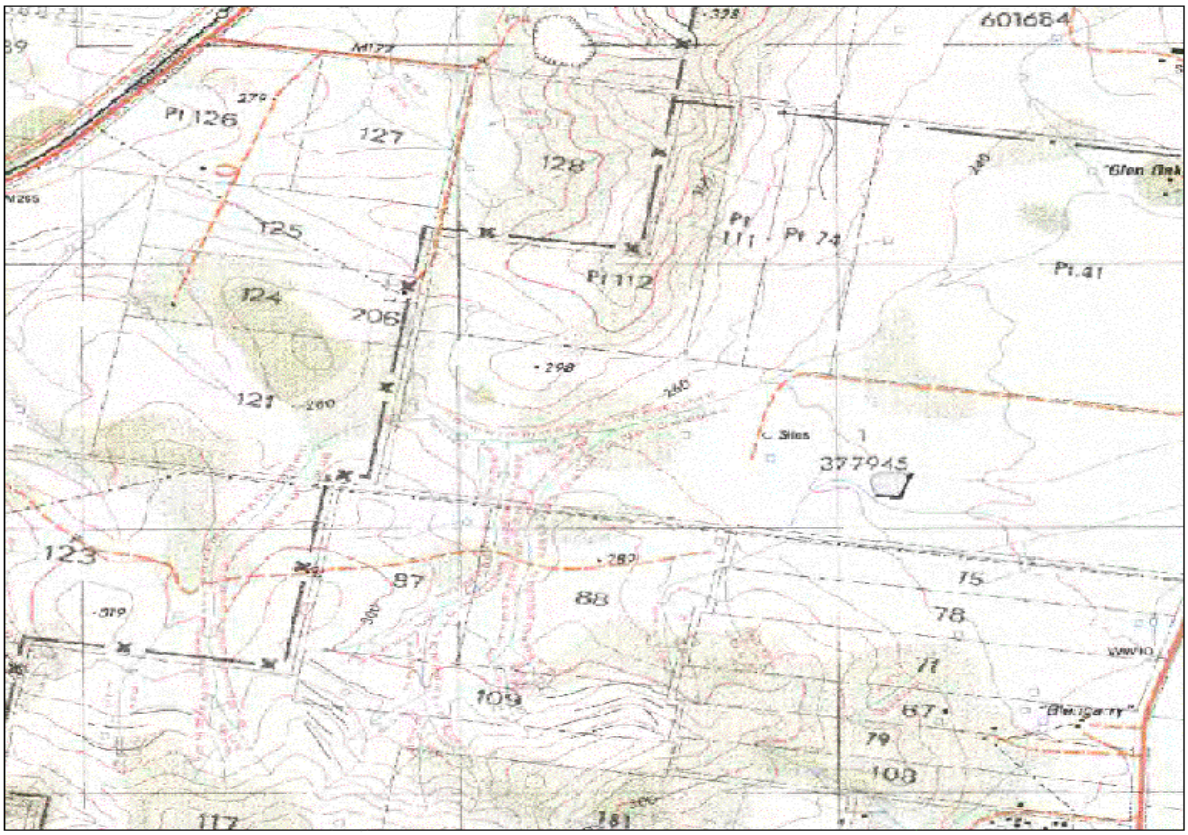
Email: jenna.amos@mjm-solutions.com

Date: 16 January 2020

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lot : 21, DP:DP1218487 with a Buffer of 1000 meters, conducted by Jenna Amos on 16 January 2020.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.



A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

0	**Aboriginal sites are recorded in or near the above location.**
0	**Aboriginal places have been declared in or near the above location. ***

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

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

Important information about your AHIMS search

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

3 Marist Place, Parramatta NSW 2150
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2020

Hydrology Report

39 Currawang Drive, Springvale, NSW 2650

Prepared for Mr. Aaron De Jong

MJM
CONSULTING ENGINEERS
CIVIL-STRUCTURAL-BUILDING DESIGN-PLANNING

REPORT REFERENCE [170514]

Document Verification Schedule

MJM CONSULTING ENGINEERS CIVIL-STRUCTURAL-BUILDING DESIGN-PLANNING	**Project** Hydrology Report 39 Currawang Drive, Springvale, NSW 2650

Revision	Date	Prepared By		Checked By		Approved By	
01	20.04.2020	Babak Shahbazi	Babak	Michael Mcfeeters		Michael Mcfeeters	

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1. Introduction

The project is intended to subdivide approximately 41.7ha land, highlighted in Figure 1, by providing roads, drainage, sewer and associated services for the creation of 16 residential lots as observed in Figure 2. The existing area is located at 39 Currawang Drive, Springvale, Wagga Wagga, NSW 2650.
The drainage design strategy used is intended to maintain the objectives for land subdivisions within the Wagga Wagga City Council (WWCC) as follows:

- provide safety for the public;
- minimise and control, nuisance flooding and to provide for the safe passage of less frequent flood;
- protect property;
- enhance the urban landscape;
- maximise the land area available for dwellings;
- minimise the environmental impact of urban runoff;
- ensure discharge rates from new developments, do not exceed the capacity of the downstream stormwater systems nor result in additional scour and instability of natural creek, river systems and artificial channels;
- conform to natural drainage patterns and discharge to natural drainage paths in the catchment.

Figure 1. Existing Land

2. Drainage System

2.1. Minor Drainage System

The minor drainage system includes underground drainage, junction pits, access chambers and outlet structures designed to fully contain and convey the discharge stormwater from the minor storm (QUDM, 2013). This arrangement also include:
• Inter-allotment drainage pits installed to collect surface runoff from within allotments, as well as the roof-water drainage provisions for buildings.

A 10% Annual Exceedance Probability (AEP) was adopted in the design of the minor system as per Wagga Wagga City Council guidelines.

2.2. Major Drainage System

The major drainage system is that part of the overall drainage system designed to convey a specified major storm flow (QUDM, 2013). This system comprises:

- Floodway channels & road reserves designed to carry flows in excess of the capacity of the minor drainage system
- Constructed waterways and swales.

A 1% AEP was adopted in the design of the major system as per WWCC guidelines.

Figure 2. Proposed Subdivision

2.3. Stormwater catchment areas

Based on topographic information of the project plan, six catchment areas are defined and depicted in Figure 3. The length and land slope of the flow paths in each of catchment areas are presented in Table 1. The calculation of peak flood rate as well as runoff travel time will be calculated for each of these catchment areas separately for two cases of existing and developed land.

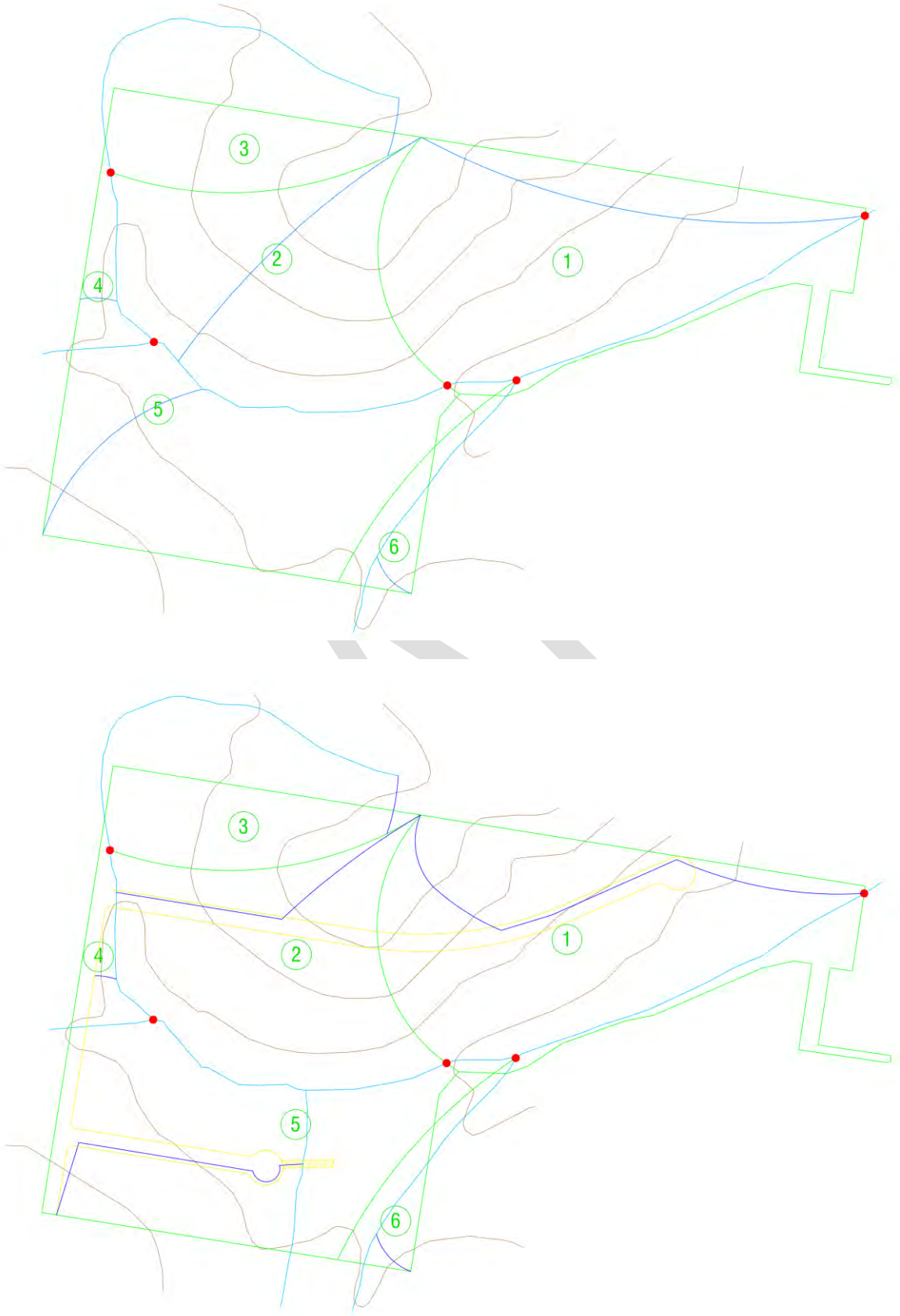


Figure 3. Catchment areas and overland flow paths; (top) existing condition, (bottom) developed condition

Table 1. Catchment details

Land Condition	Catchment area	Area (ha)	Length (m)	Kinematic Length (m)	Slope (%)
Existing	1	14.598	610	100	7.4
	2	10.285	930	100	3.8
	3	3.743	665	80	3.2
	4	1.067	125	50	4
	5	10.919	640	100	3.9
	6	1.1185	370	70	3.2
Developed	1	14.598	720	100	6.3
	2	10.285	1080	100	3.2
	3	3.743	665	80	3.2
	4	1.067	105	30	4
	5	10.919	720	100	3.5
	6	1.118	370	70	3.2

2.4. Estimation of Peak Flood

The maximum or peak flood value generated by rainfall is required for the design of many hydraulic structures such as storage and detention reservoirs, highway and railway culverts, urban sewers lines, and stormwater network. To estimate the magnitude of a flood peak when direct measurements cannot be obtained, the following methods are used:

- Rational method
- Empirical methods
- Unit hydrograph methods

The use of a particular method depends upon the desired objective, the available data and the importance of the project (Rakhecha & Singh, 2009).

2.4.1. Estimation of flowrates by the rational method

This method of estimating the peak flood discharge is based on physical and hydraulic properties of catchments and their effects on storm rainfall. The peak flood discharge value is given as:

$$Q = \frac{CIA}{360} \qquad \text{Equation 1}$$

where Q is peak flood discharge in $^{m^3}/_{s}$, C is runoff coefficient, A is catchment area in ha, and I is rainfall intensity in $^{mm}/_{hr}$ with the selected recurrence interval in years and duration equal to the catchment's time of concentration in minutes. The time of concentration is defined as the longest time which would be required for surface runoff from the remotest part of the catchment to reach the outlet or the point of interest on the water course. The time varies depending on the slope and characteristics of land surfaces. There are a number of empirical equations for the estimation of the time of concentration. Coefficient C represents the integrated effect of catchment losses and therefore depends upon the nature of the surface, surface slope, and rainfall intensity. The rainfall

intensity corresponding to the rainfall duration and the desired recurrence interval for the catchment can be found from rainfall Intensity-Frequency-Duration (IFD) curves.

2.5. Surface Runoff and Travel Times

Overland flow before discharge to stormwater pipe system should be considered in stormwater design. The recommended approach by Australian Rainfall and Runoff (AR&R) and WWCC (WWCC, 2017) to determine time of concentration for overland flow is Kinematic Wave equation shown below.

$$T_1 = \frac{6.94\ (Ln^*)^{0.6}}{{i_1}^{0.4}\ S^{0.8}}$$ Equation 2

Inputs in Kinematic Wave equation are flow path length (L), land slope (S), and surface roughness (n*), whereas overland flow time (t_1) and rainfall intensity (i_1) are outputs.

There is a limitation in application of Kinematic Wave equation which restricts the maximum length of flow path to 100 meters. Since the flow path length in this project is more than the maximum value allowed in the formula, the overall time of concentration is calculated in two stages. In first stage, Kinematic Wave is utilized for the first 100m length of the flow path. Then in second stage, manning's equation for open channel flows are utilized to find out the travel time in second part of flow path. Application of manning's equation is justifiable in this case because it is assumed that a naturally overland flow is generated into an earth lined open channel which flows through the lowest elevation along the flow path in each catchment area. Manning's equation is presented below.

$$Q_2 = \frac{AR^{\frac{2}{3}}S^{0.5}}{n}$$ Equation 3

Where A is cross sectional area of overland flow, R is hydraulic radius, S is longitudinal land slope, and n is manning's roughness coefficient. After realization of manning's flow, section details, and path length, time of concentration can be calculated.

2.5.1. Kinematic Wave equation

In this section, runoff travel time for the first 100m of overland flow is calculated. Length of flow is clearly considered to be 100m. Surface roughness (n*) is assumed to be $n^* = 0.07$ as suggested by Table 4.8.2 (WWCC, 2017) for surface type of bare clay and eroded loam soil. As the contours can be seen in Figure 2, topographic information of the region are used to determine slope of flow pathway in each catchment area which are shown in Table 1. Table 2 presents the results of Kinematic Wave approach including intensity and Kinematic travel time (T_1).

Table 2. Kinematic Wave equation

Catchment area	Kinematic Length (m)	Roughness, n*	Slope (%)	ARI (years)	Intensity, mm/hr	Kinematic travel time, T_1, min
1	100	0.07	7.4	10	91.4	8.5
	100	0.07	7.4	100	166.4	6.8
2	100	0.07	3.8	10	82.78	10.7
	100	0.07	3.8	100	151	8.5
3	80	0.07	3.2	10	86.31	9.7
	80	0.07	3.2	100	157.2	7.7
4 (Existing)	50	0.07	4	10	101.8	6.6
	50	0.07	4	100	185	5.3
4 (Developed)	30	0.07	4	10	116.3	5
	30	0.07	4	100	211.4	5
5	100	0.07	3.9	10	83.1	10.6
	100	0.07	3.9	100	151.6	8.4
6	70	0.07	3.2	10	88.7	8.9
	70	0.07	3.2	100	163.5	7.1

2.5.2. Rational method

According to rational method, three parameters are needed to determine the flow; catchment area, runoff coefficient, and rainfall intensity.

Ratio of impervious area is required to figure out the runoff coefficient. All impervious area including buildings, pools, parking lots, and roadways for the existing and developed land condition are measured through six maps and shown in Table 3. The impervious ratio is then used to find out run off coefficient (C) which is needed in calculation of natural catchment discharge flow (Q). Based on Table 4.13.1 in part 3 of the WWCC engineering guidelines for subdivisions and development standards (WWCC, 2017), runoff coefficient is interpolated and shown in Table 3 and Table 4 for existing and developed land conditions. In addition, the frequency factor for runoff coefficient is determined for annual recurrence intervals of 10 and 100 years.

Table 3. Natural catchment flow calculations for existing land

Catchment area	Total area (ha)	Impervious area	Impervious ratio	ARI	Rounoff coeff. (C)	Frequency factor	Frequency factor coefficient
1	14.598	0.47	0.032	10	0.213	1	0.213
				100	0.256	1.2	0.307
2	10.285	0	0	10	0.190	1	0.19
				100	0.230	1.2	0.276
3	3.743	0	0	10	0.190	1	0.19
				100	0.230	1.2	0.276
4	1.067	0	0	10	0.190	1	0.19
				100	0.230	1.2	0.276
5	10.9195	0	0	10	0.190	1	0.19
				100	0.230	1.2	0.276

6	1.1185	0	0	10	0.190	1	0.19
				100	0.230	1.2	0.276

Table 4. Natural catchment flow calculations for developed land

Catchment area	Total area (ha)	Impervious area	Impervious ratio	ARI	Rounoff coeff. (C)	Frequency factor	Frequency factor coefficient
1	14.598	2.044	0.14	10	0.288	1	0.288
				100	0.346	1.2	0.415
2	10.285	2.571	0.25	10	0.370	1	0.37
				100	0.445	1.2	0.534
3	3.743	0.711	0.19	10	0.323	1	0.323
				100	0.391	1.2	0.469
4	1.067	0.417	0.39	10	0.474	1	0.473
				100	0.572	1.2	0.686
5	10.9195	2.511	0.23	10	0.354	1	0.354
				100	0.427	1.2	0.512
6	1.1185	0.123	0.11	10	0.267	1	0.267
				100	0.319	1.2	0.383

2.5.3. Manning's equation

In this section, runoff travel time for the second part of overland flow is calculated. It is assumed that a naturally overland flow is concentrated and flown through an earth trapezoidal-shape open channel with base width of five meters and bather slopes of 1 in 10 either side. Manning's roughness coefficient (n) is assumed to be $n = 0.035$ according to Table 4.8.3 (WWCC, 2017) for surface type of earth with weeds or gravel. Land slope (S) is considered as calculated in Kinematic Wave section for each catchment areas.

Manning's flow (Q_2) can be calculated for any arbitrary cross sectional area of flow. After the manning's flow (Q_2) is determined, velocity of flow can be simply calculated having the cross sectional area of overland flow (A). Then, runoff travel time (T_2) for second part of overland flow path can be calculated using the flow velocity and path length. Eventually, time of concentration which by definition is the longest time required for overland runoff to reach the outlet from the remotest part of the catchment can be calculated as the summation of travel times calculated for Kinematic Wave (T_1) and manning's equations (T_2).

However, since the cross sectional area of overland flow (A) and consequently the depth of water in the open channel is unknow, trial and error approach is used as the problem solving method to determine overland flow based on trial water depth values. The process starts with calculating manning's flow (Q_2) and manning's travel time with a trail depth of water. Manning's travel time is added to the Kinematic Wave one to work out the time of concentration from which intensity of flow can be measured based on Bureau of Meteorology (BOM) data (BOM, 2016) shown in Figure 4. This intensity is then substituted into Equation 1 to calculate rational method flow (Q) for the whole catchment. Trial continues until manning's flow (Q_2) is very close or equal to the rational method flow (Q) for the whole catchment area. The reason is that the flow of overland stormwater is expected to be constant throughout the whole path length as a steady flow. Results of the trial and error method for all catchments in existing and developed land condition for ARI 10 and 100 years are presented in Table 5.

Table 5. Summary of times of concentration for catchment areas

Pre/post construction	Catchment area	ARI	Depth of water	Rational or Manning's flow (Q= Q_2), m^3/s	Manning's travel time, T_2 (min)	Kinematic travel time, T_1 (min)	Time of Concentration, T (min)
Existing land	1	10	0.087	0.72	6.1	8.5	14.6
		100	0.15	1.91	4.5	6.8	11.3
	2	10	0.066	0.32	16.4	10.7	27.1
		100	0.12	0.9	11.5	8.5	20.0
	3	10	0.04	0.12	17.1	9.7	26.8
		100	0.07	0.32	12.2	7.7	19.9
	4	10	0.03	0.06	2.6	6.6	9.2
		100	0.042	0.15	1.9	5.3	7.2
	5	10	0.075	0.4	9.7	10.6	20.3
		100	0.132	1.07	7.0	8.4	15.4
	6	10	0.02	0.038	13.6	8.9	22.5
		100	0.037	0.108	9.2	7.1	16.3
Developed land	1	10	0.107	0.94	7.1	8.5	15.6
		100	0.181	2.41	5.3	6.8	12.1
	2	10	0.102	0.62	16.3	10.7	27.0
		100	0.179	1.68	11.8	8.5	20.3
	3	10	0.055	0.21	14.0	9.7	23.7
		100	0.1	0.596	9.8	7.7	17.5
	4	10	0.045	0.17	1.8	5	6.8
		100	0.074	0.39	1.3	5	6.3
	5	10	0.111	0.75	9.4	10.6	20.0
		100	0.193	2.02	6.8	8.4	15.2
	6	10	0.13	0.056	11.8	8.9	20.7
		100	0.046	0.156	8.0	7.1	15.1

2.6. Existing and developed land conditions comparison

The existing and developed land conditions are compared in terms of peak flow rate and time of concentration. The results are shown in Table 6. Peak flow rate is higher for the developed case whereas the time of concentration is lower for most of cases. The reason is that impervious ratio increases as a result of construction and land development which leads to higher runoff coefficient and consequently higher flow rate (recall rational method). On the other hand, this higher flow rate means higher velocity of flow in manning's equation and less time of concentration needed for the overland rainfall to flow through the path distance. However, when the flow path distance increases after construction (for instance in catchment 1), a longer time of concentration is likely to occur.

Table 6. Existing and developed land comparison

Pre/post construction	Catchment area	ARI	Overland flow, m^3/s	Change in flow, m3/s	Increase in flow, %	Time of concentration, (min)	Change in time of concentration, min	Change in time of concentration, %
Existing land	1	10	0.72	-	-	14.6	-	-
		100	1.91	-	-	11.3	-	-
	2	10	0.32	-	-	27.1	-	-
		100	0.9	-	-	20	-	-
	3	10	0.12	-	-	26.8	-	-
		100	0.32	-	-	19.9	-	-
	4	10	0.06	-	-	9.2	-	-
		100	0.15	-	-	7.2	-	-
	5	10	0.4	-	-	20.3	-	-
		100	1.07	-	-	15.4	-	-
	6	10	0.038	-	-	22.5	-	-
		100	0.108	-	-	16.3	-	-
Developed land	1	10	0.94	0.22	30	15.6	1	6.8
		100	2.41	0.5	26	12.1	0.8	7.1
	2	10	0.62	0.3	93	27	-0.1	-0.4
		100	1.68	0.78	86	20.3	0.3	1.5
	3	10	0.21	0.09	75	23.7	-3.1	-11.6
		100	0.596	0.27	86	17.5	-2.4	-12.1
	4	10	0.17	0.11	183	6.8	-2.4	-26.1
		100	0.39	0.24	160	6.3	-0.9	-12.5
	5	10	0.75	0.35	87	20	-0.3	-1.5
		100	2.02	0.95	88	15.2	-0.2	-1.3
	6	10	0.056	0.018	47	20.7	-1.8	-8
		100	0.156	0.048	44	15.1	-1.2	-7.4

3. References

NSW Spatial Services. (n.d.). SIX Maps. Retrieved from SIX Maps: https://maps.six.nsw.gov.au/

QUDM. (2013). Queensland Urban Drainage Manual - Third edition. Department of Energy and Water Supply.

Rakhecha, P., & Singh, V. P. (2009). Applied hydrometeorology: Springer Science & Business Media.

WWCC. (2017). Engineering guidelines for subdivisions and development standards.

BOM. (2016). Design Rainfall Data System Retrieved from http://www.bom.gov.au/water/designRainfalls/revised-ifd/

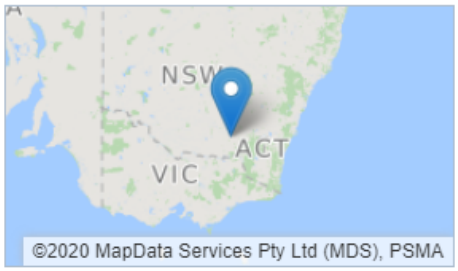
4. Appendix

Location

Label: Wagga Wagga

Latitude: -35.1841 [Nearest grid cell: 35.1875 (S)]

Longitude: 147.3678 [Nearest grid cell: 147.3625 (E)]



IFD Design Rainfall Intensity (mm/h)

Issued: 27 February 2020

Rainfall intensity for Durations, Exceedance per Year (EY), and Annual Exceedance Probabilities (AEP).
FAQ for New ARR probability terminology

Table | Chart

Unit: mm/h

	Annual Exceedance Probability (AEP)						
Duration	**63.2%**	**50%#**	**20%***	**10%**	**5%**	**2%**	**1%**
1 min	104	118	166	200	233	278	314
2 min	88.5	101	141	169	196	234	263
3 min	80.3	91.7	128	153	178	213	239
4 min	74.0	84.5	118	142	165	197	222
5 min	68.9	78.7	110	132	154	184	207
10 min	52.2	59.7	83.8	101	118	141	159
15 min	42.6	48.8	68.6	82.4	96.3	115	130
20 min	36.3	41.6	58.5	70.3	82.1	98.2	111
21 min	35.3	40.4	56.8	68.3	79.8	95.5	108
22 min	34.4	39.3	55.3	66.5	77.7	92.9	105
23 min	33.5	38.3	53.9	64.7	75.7	90.5	102
24 min	32.7	37.4	52.5	63.1	73.7	88.2	99.5
25 min	31.9	36.5	51.2	61.6	71.9	86.0	97.1
26 min	31.1	35.6	50.0	60.1	70.2	83.9	94.7
27 min	30.4	34.8	48.9	58.7	68.6	82.0	92.5
28 min	29.7	34.0	47.8	57.4	67.0	80.1	90.4
29 min	29.1	33.3	46.7	56.1	65.6	78.4	88.4
30 min	28.5	32.6	45.7	55.0	64.2	76.7	86.6
31 min	27.9	31.9	44.8	53.8	62.8	75.1	84.7
32 min	27.3	31.3	43.9	52.7	61.6	73.6	83.0
33 min	26.8	30.7	43.0	51.7	60.4	72.1	81.4
34 min	26.3	30.1	42.2	50.7	59.2	70.7	79.8
35 min	25.8	29.5	41.4	49.8	58.1	69.4	78.3
36 min	25.4	29.0	40.7	48.8	57.0	68.1	76.8
37 min	24.9	28.5	40.0	48.0	56.0	66.9	75.4
38 min	24.5	28.0	39.3	47.1	55.0	65.7	74.1

Figure 4. Design rainfall intensity

Southern Bushfire Solutions

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Bushfire Assessment Report

Residential Subdivision

LOT 21 DP 1218487
39 Currawang Dr
Springvale, NSW.

Executive Summary

The proposal involves the subdivision of a 40.7 Ha lot into sixteen lot rural-residential lots with public road access and associated services. Bushfire hazard vegetation exist in a patch of woodland on the hilltops to the north and west of the development as well as the grassland and remnant vegetation along the riparian zone within the development site. The Eastern end of the development is bounded by similar large lot rural residential blocks and are not considered to represent a bushfire hazard.

The new lots are all greater than 2Ha with large building envelopes and 10m building setbacks from the boundaries. There is sufficient space inside the building entitlements for future construction to achieve and APZ in excess of the minimum requirement of PBP (2019), while also providing room for ancillary buildings, landscaping and other non-residential features that do not require an APZ.

Subject to recommendations, this assessment finds that the proposal can achieve the required specifications of NSW Planning for Bushfire Protection (2019) through use of the acceptable solutions and achieve Bushfire Safety Authority from NSW Rural Fire Service for development consent under S100B of the Rural Fires Act.

Summary of PBP (2019) Compliance

	Performance Criteria	*Compliance*	*Comment*
Asset Protection Zones	• Potential building footprints must not be exposed to radiant heat levels exceeding 29kw/m^2 on each proposed lot • APZs are managed and maintained to prevent the spread of fire towards the building. • APZ is provided in perpetuity. • APZ maintenance is practical, soil stability is not compromised and the potential for crown fires is minimised.	Meets acceptable solutions	There is sufficient space within each lot to provide an APZ that exceeds the requirements of A1.12.3 of PBP (2019) for future construction. There are no steep slopes or riparian zones located within the APZ's.
Landscaping	• Landscaping is designed and managed to minimise flame contact and radiant heat to buildings and the potential for wind driven embers to cause ignitions.	Meets acceptable solutions	Landscaping detail will be addressed at DA for construction of buildings.
Access – General Requirements	• Firefighters are provided with safe all-weather access to structures • The capacity of access roads is adequate for firefighting vehicles • There is appropriate access to water supply • Parking does not obstruct the minimum paved road width	Meets acceptable solutions	All public roads are 2-way bitumen sealed roads in the development. Bridges or causeways are to have a minimum 23 tonne load rating signposted. Reticulated feed hydrants are to be provided in the road verge and there is no on street parking provision.

Access – Perimeter roads	• Access roads are designed to allow safe egress for firefighting vehicles while residents are evacuating as well as providing a safe operational environment for emergency service personnel during firefighting and emergency management on the interface	Meets acceptable solutions	A perimeter road is provided by the existing Dunns Rd to the south and new road to the west. Recommendations are made to continue access provisions road along the road easement on the west of lot 16 to improve firefighting access to the interface.
Access – Non Perimeter roads	• The width and design of fire trails enable safe and ready access for firefighting vehicles • Fire trails are trafficable under all weather conditions. Where fire trails join a public road, access shall be controlled to prevent use by non-authorized persons. • Fire trails are designed to prevent weed infestation, soil erosion	Meets acceptable solutions	Non -perimeter roads are 2 way bitumen sealed roads. A turning circle of >12m is provided for dead end roads and an emergency access is provided to Currawang Drive to provide through access for emergency vehicles. No fire trails are involved in this proposal.
Property Access	• Firefighting vehicles can access the dwelling and exit the property safely	Meets acceptable solutions	Property access will be addressed at DA for construction when the position of the building is confirmed.
Water Supplies	• Adequate water supply is provided for firefighting purposes • Water supply is located at regular intervals • Water supply is accessible and reliable for firefighting operations • Flows and pressures are appropriate • The integrity of the supply is maintained	Meets acceptable solutions	Reticulated supply feed hydrants are to be provided at spacing, pressure and flow to comply with AS2419.1:2005. Where riverina water restrictions apply and the reticulated system is not capable of meeting the pressure/flow requirements, a 20,000L static water supply is to be provided in line with the requirements of PBP (2019) at construction of any residential building.
Electricity services	• Location of electricity services limits the possibility of ignition of the surrounding bushland or the fabric of buildings	Meets acceptable solutions	All electrical transmission lines are to be underground where possible.
Gas Services	• Location and design of gas services will not lead to ignition of surrounding bushland or the fabric of buildings	Meets acceptable solutions	No reticulated gas supply is involved in this proposal. Bottled gas supply will be addressed at DA for construction if required.

Limitations and Disclaimer

This bushfire assessment report is primarily concerned with assessing the capacity of the proposed development to meet the legislated requirements for development consent. Where necessary, bushfire protection measures will be recommended.

The measures prescribed cannot guarantee that the development will survive a bushfire event on every occasion. This is primarily due to the degree of vegetation management, the unpredictable behavior of fire, extreme weather conditions and the actions of occupants and firefighters. In extreme conditions buildings may be considered un-defendable. Early evacuation is recommended as the safest course of action for life safety. A comprehensive bushfire survival plan is recommended for all occupants on bushfire prone lands.

Southern Bushfire Solutions has prepared this report with all reasonable diligence on behalf of the proponent. The information contained in this report has been gathered from field investigations of the site, plans provided and consultation with the client.

No assessment has been made on other aspects of the proposal outside the scope of this report.

Amendment schedule

Version	Date	Reason for issue	Draft
1	Tuesday, April 21, 2020	Initial production	1.1
2	Thursday, July 23, 2020	Addition of layout E, F and G as alternate considerations	2.1
Prepared by	Neil Willis (BPAD31129)		
Signature			

Table of Contents

1. Introduction

1.1 Background and brief

The Environmental Planning and Assessment Act (1979) requires the Commissioner of the NSW Rural Fire Service (RFS) in conjunction with local councils, to identify and map bushfire prone land (BFPL) as a trigger for development to meet a range of planning and construction requirements for bushfire protection. BFPL maps are to be maintained and made publicly available by local councils.

Subdivision of bushfire prone land that could be used for residential or rural residential purposes requires the issue of a Bushfire Safety Authority (BFSA) from NSW RFS under Section 100B of the Rural Fires Act (1997). To obtain a BFSA, the development is required to comply with standards regarding setbacks, water supply and other matters considered necessary for the protection of life, property and the environment from the effects of bushfire.

Clause 44 of the Rural Fires Regulation (2002) sets out the information requirements for the issue of Bushfire Safety Authority and requires assessment against the specifications and performance criteria of NSW Planning for Bushfire Protection (PBP) 2006. This report is an assessment of the proposal against the specific objectives and performance criteria for rural-residential subdivision set out in PBP 2019.

1.2 Aims and Objectives of this Bushfire Assessment

The aim of this assessment is to determine the ability of the proposal to achieve an appropriate level of bushfire protection to satisfy the objectives and performance requirements for residential and rural residential subdivision as per section 5 of PBP (2019). The specific objectives for rural residential subdivision of PBP (2019) are

- Minimise the perimeters of the subdivision exposed to the bushfire hazard
- Minimise vegetated corridors that permit the passage of bushfire towards the buildings
- Provide for the siting of future dwellings away from ridgetops, steep slopes within saddles and narrow ridge crests.
- Ensure that APZ's between the bushfire hazard and future dwellings are effectively designed to address the relevant bushfire attack mechanisms
- Ensure the ongoing maintenance of APZ's
- Provide access from all properties to the wider road network for residents and emergency services
- Provide access to hazard vegetation to facilitate bushfire mitigation work and suppression
- Ensure the provision of an adequate supply of water and other services to facilitate firefighting.

Recommendations are made where appropriate for compliance and to ensure adequate bushfire protection measures for the development.

1.3 Bushfire Assessment Methodology

This bushfire assessment follows the methodology summarized in the following table:

Methodology	Task	Considerations
Desktop analysis to ascertain scope and requirements of the development.	Collate and review available mapping resources, relevant policy documents and development plans.	• NSW SIX Mapping, Google maps. • Development plans provided by client. • NSW Planning for Bushfire Protection (2019) • AS3959-Construction of Buildings in Bushfire Prone Areas (2009)
Site inspection and consultation with the proponent	View the site and bushfire hazard; classify dominant vegetation and measure slope and distances. Detailed discussion with the proponent to establish objectives and limitations of the proposal.	The site inspection enables verification of mapping data and classification of the surrounding vegetation, slope, Asset Protection Zones and environmental constraints. Photographing of relevant features for presentation.
Detailed assessment	Perform assessment of the development proposal against performance requirements of PBP and AS3959.	Assess the ability of the proposal to meet the intent and performance criteria of the relevant sections of PBP and make recommendations to address identified shortfalls.
Report	Preparation of Bushfire Assessment Report.	Produce necessary documentation to demonstrate the proposals ability to achieve the aims and objectives of PBP to accompany the development application.

1.4 Identification of Stakeholders

Company	Position	Name	Contact
MJM Consulting Engineers	Consultant on behalf of proponent	Jenna Amos	**PH:** 69218333 **E:** jenna.amos@mjm-solutions.com
Wagga Wagga Council	Approval Authority		**PH:** (02) 1300 292 442 **E:** council@wagga.nsw.gov.au
NSW Rural Fire Service	Approval Authority		**PH:** 02 8741 5555 **E:** records@rfs.nsw.gov.au
Southern Bushfire Solutions	BPAD Consultant	Neil Willis	**PH:** 0402 604000 **E:** info@southernbushfiresolutions.com.au

2. Scope of the Proposal

2.1 Site Location and Description.

The site is located at lot 21 DP 1218487, 39 Currawang Dr, Springvale, approximately 8km south west of Wagga City. The subject property is approximately 40.7Ha zoned R5-Large Lot Residential and RU1 – Primary Production in the Wagga Wagga LEP (2010). The property is adjacent to an extensive area of large lot residential development.

Figure 1: Location of proposed development

(NSW Land and Property Information, 2020)

Figure 2: Site Image with approximate lot boundary

(Google Earth, 2020)

Wagga Wagga bushfire prone land mapping shows an area of vegetation category 1 to the west of the site with the vegetation buffer extending onto the western portion of the lot, represented as yellow on the bush fire prone land map. Vegetation category 1 has the highest combustibility and likelihood of forming fully developed fires including heavy ember production. Vegetation Category 1 consists of areas of forest, woodlands, heaths (tall and short), forested wetlands and timber plantations. (NSW Rural Fire Service, 2015).

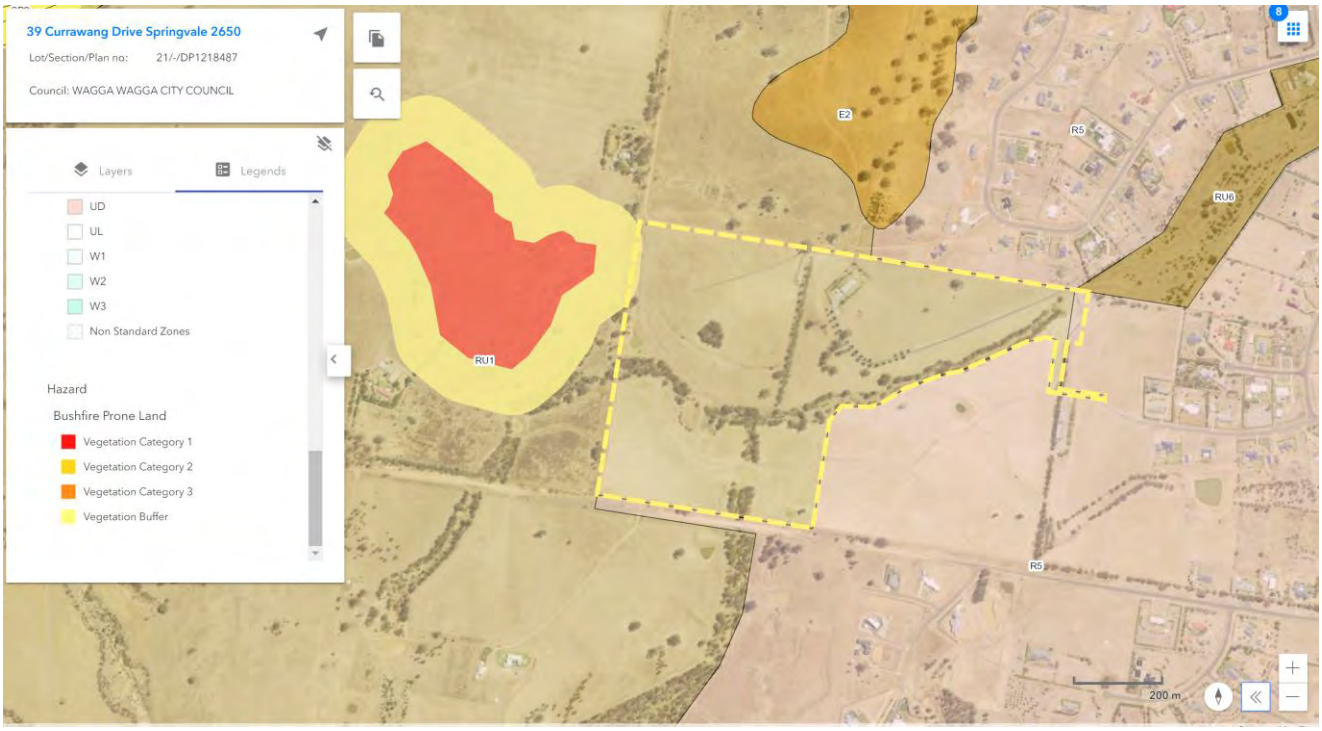

Figure 3: Wagga Wagga Bushfire Prone Land Map
(NSW Planning and Environment, 2020)

2.2 Characteristics and Description of the Proposal

The proposal is initially seeking to rezone the property from RU1 Primary Production to R5 Large Lot Residential with a minimum lot size of 2Ha. Should the planning proposal be successful, then a DA for subdivision of the property consistent with the development plan provided would be prepared and lodged with council.

The plan below details the potential layout of the new lots and public access roads, as well as the buffer area of the category 1 vegetation and the areas of native vegetation identified in the biodiversity assessment.

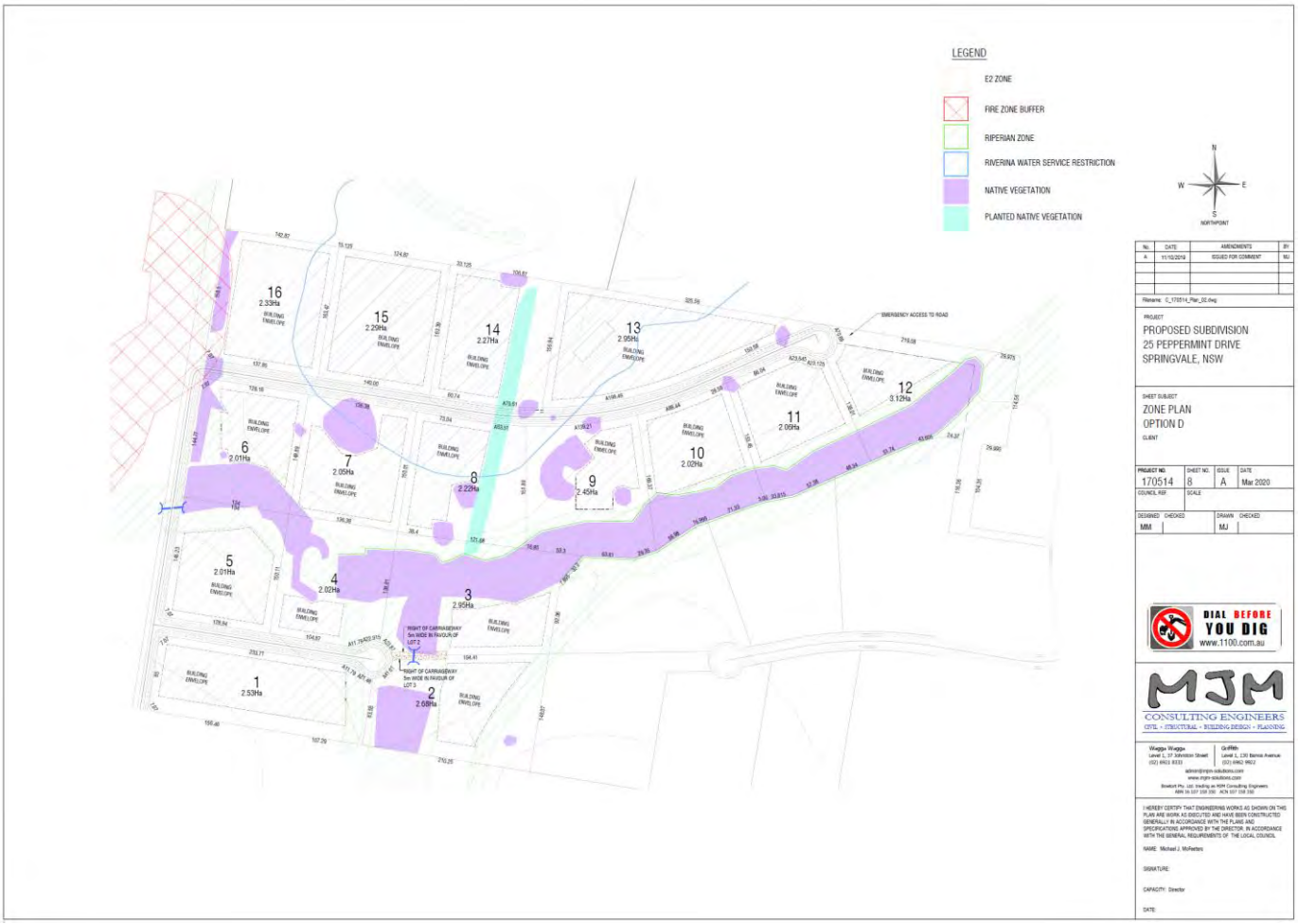

Figure 4: Potential Subdivision Layout

Figure 5: Development plan overlayed on Google earth imagery

3. Bushfire Hazard Assessment

3.1 Vegetation Classification

PBP (2019) requires identification of the vegetation surrounding the proposed development to a distance of 140 meters.

The area has been broken down into areas for assessment and classification as follows:

Figure 6: Bushfire Hazard Identification

Area A and B

Area A and B are areas of hilltop vegetation, outside the development footprint.

These areas have been classified as "Southern Tablelands Grassy Woodlands" in accordance with Ocean Shores to Desert Dunes (Keith, 2004) and are considered a "woodland" for fuel load assessment.

> *"Woodlands"*
> *"Dominated by an open to sparse layer of Eucalypts with the crowns rarely touching. Typically 15-35m high (may be shorter at sub-alpine altitudes). Diverse ground cover of grasses and herbs, Shrubs are sparsely distributed. Usually found on flat to undulating ground."* (NSW Rural Fire Service, 2019)

Figure 7: Woodland vegetation on the hilltop at Area A to the north of the development

Figure 8: Woodland vegetation on the hilltop at Area B to the west of the development

Area C

Area C is the 20 to 30m wide strip of native vegetation along the erosion gully running West to East through the development and the ~0.25Ha pocket of native vegetation in the north west quadrant. These areas are of a size and shape that have less opportunity to support a fully developed bushfire. A simplified approach for remnant vegetation is considered appropriate to assess these areas of vegetation. Setbacks will be considered as per rainforest vegetation in accordance with A1.11.1 of PBP (2019)

Figure 9: remnant vegetation along the riparian zone through eastern end of the development

Figure 10: remnant vegetation along the riparian zone through western end of the development

Figure 11: 0.25Ha patch of remnant vegetation on lot 7.

Area D

Area D is the remaining areas of vegetation in the survey area. The area has generally been pasture improved for grazing. There is a windbreak running north south through the site and occasional paddock trees that are consistent with the low threat vegetation exclusions.

This area is considered consistent with Grassland vegetation for fuel load assessment

> *"Grasslands"*
> *"Dominated by large perennial tussock grasses and the presence of broad-leaved herbs on flat topography. Lack of woody plants. Plants include grasses, daisies, legumes, geraniums, saltbushes and copperburrs."* (NSW Rural Fire Service, 2019)

Figure 12: Grassland vegetation at the western end of the development site.

Figure 13: Grassland vegetation at the Eastern end of the development site.

Figure 14: Grassland vegetation at the Eastern end of the development site with the windbreak running north-south through the site.

3.2 Slope Influencing Bushfire Behaviour

The “effective slope” for the bushfire assessment is the slope under the vegetation that directly influences bushfire behavior. PBP (2019) requires the effective slope to be determined under the dominant vegetation type for a distance of 100m.

(2019)

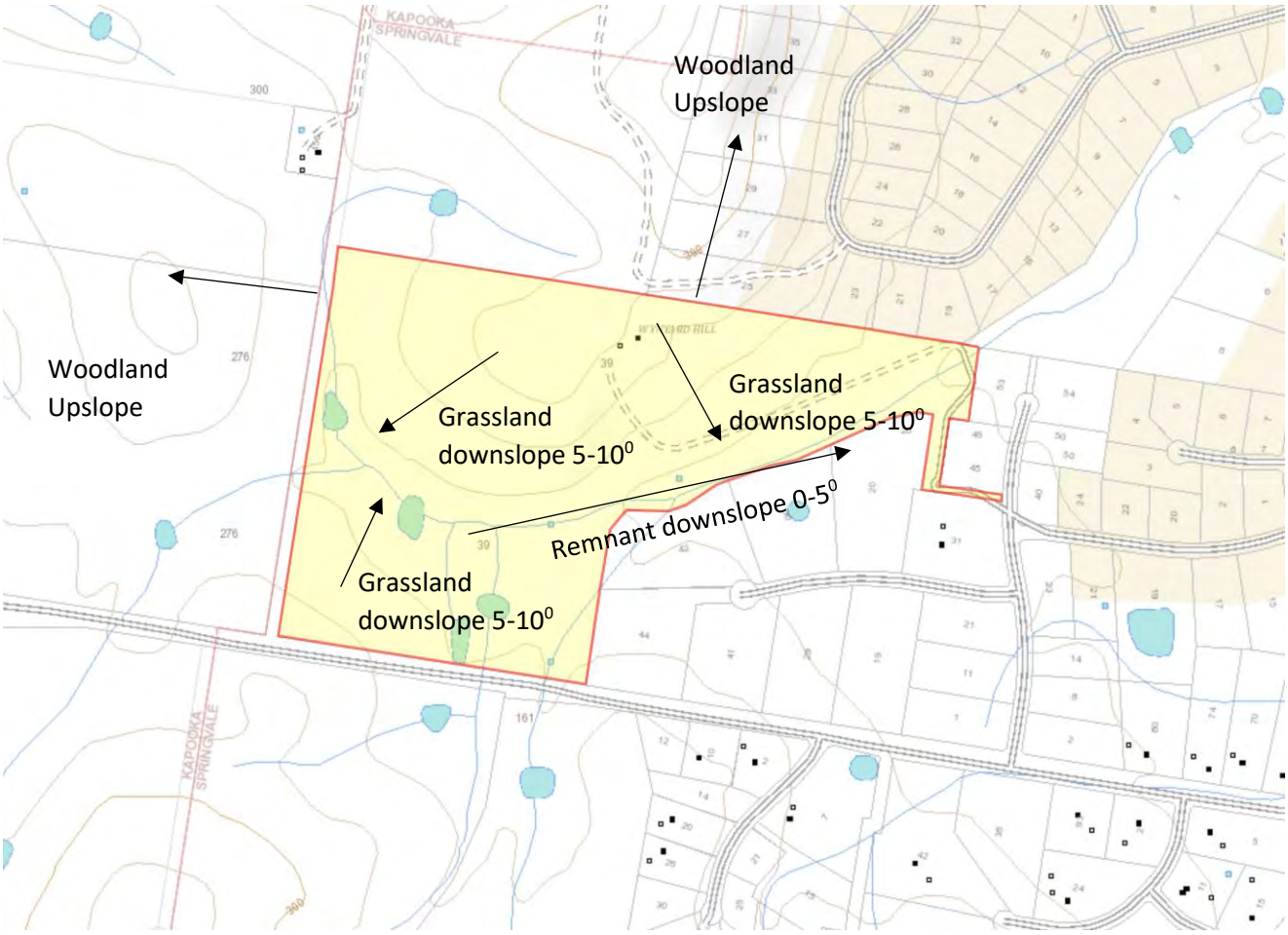

Figure 15: 10m contour map of the development with slope and vegetation categories
(NSW Land and Property Information, 2020).

3.3 Local Fire and Weather Conditions

The fire season for the Eastern Riverina district is typically from November through to March, with hot summer temperatures above 30 degrees and low relative humidity. The wind can be strong and gusty, typically coming from the North to North-West and the potential for rapid changes.

At landscape level, bushfire’s typically come from the North to North-West due to the dominant wind direction. However, localised influences can dramatically alter the fire behaviour and result in bushfire travelling in any direction.

These weather patterns coupled with the potential for dry lightning storms and incidental ignitions from surrounding properties are a significant factor in the overall fire risk for the area.

For bushfire assessment purposes, Wagga Wagga City Council LGA is in the Eastern Riverina Fire Area and has a Fire Danger Index (FDI) of 80 assumed as a 1:50 year event according to NSW RFS.

4. Environmental Features and Considerations

An independent environmental assessment has been undertaken for the development that has identified the areas of native vegetation through the development. These areas are outside the building envelopes and limited impact is expected on the native vegetation

Building setbacks are to minimise impact on the riparian zone of the gully and the remnant vegetation and no steep slopes above 18 degrees were identified in the development site.

5. Detailed Development Assessment

The following sections are a detailed assessment of the proposal against the standards required for bushfire protection measures for residential and rural residential subdivisions:

5.1 Asset Protection Zones (APZ)

The APZ is a fuel reduced area surrounding a building or structure. The intent of the APZ detailed in PBP (2019) is:

> *"To provide sufficient space and maintain reduced fuel loads to ensure radiant heat levels at buildings are below critical limits, and prevent direct flame contact"* (NSW Rural Fire Service, 2019)

An APZ in forest vegetation can be divided into an "Inner Protection Area" and "Outer Protection Area". They can be defined as follows:

- Inner Protection Area: closest to buildings incorporating the defendable space and for managing heat intensities at the building surface;
- Outer Protection Area: for reducing the potential length of flames by slowing the rate of spread, filtering embers and suppressing the crown fire.

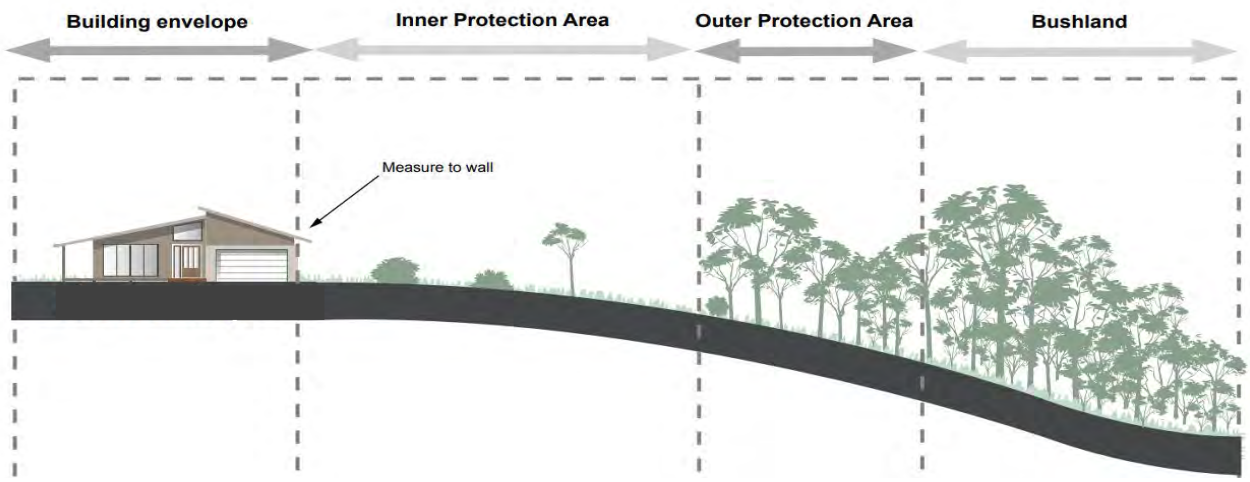

Figure 16: Components of a typical APZ
(NSW Rural Fire Service, 2019)

Asset Protection Zone	
	PERFORMANCE CRITERIA TO BE ACHIEVED:
	Section 5.3.1 of PBP states that the intent of measures may be achieved where: ● Potential building footprints must not be exposed to radiant heat levels exceeding 29kw/m^2 on each proposed lot ● APZs are managed and maintained to prevent the spread of fire towards the building. ● APZ is provided in perpetuity. ● APZ maintenance is practical, soil stability is not compromised and the potential for crown fires is minimised.
	METHOD OF MEETING THE PERFORMANCE CRITERIA:
	Compliance with the Acceptable solutions of table 5.3a of PBP (2019)

All lots in this subdivision are greater than 2Ha and set in grassland and remnant vegetation. The building envelopes have 10m minimum building setback from the lot boundaries. There is space provided within each lot to achieve the minimum APZ requirements of Table A1.12.3 of PBP (2019) for a residential building, as well as providing space for ancillary development such as class 10 buildings that do not require an APZ to have adequate separation from the residential building.

The specific location of the APZ within each lot is to be confirmed at DA for construction when the building footprint in known.

Minimum APZ calculations for Eastern Riverina (FDI 80) as per table A1.12.3 of PBP (2019)

Vegetation classification	Effective slope category	Minimum APZ Distance
Woodland	Upslope	11m
Remnant (rainforest)	0-5 downslope	12m
Grassland	5-10^0 downslope	12m

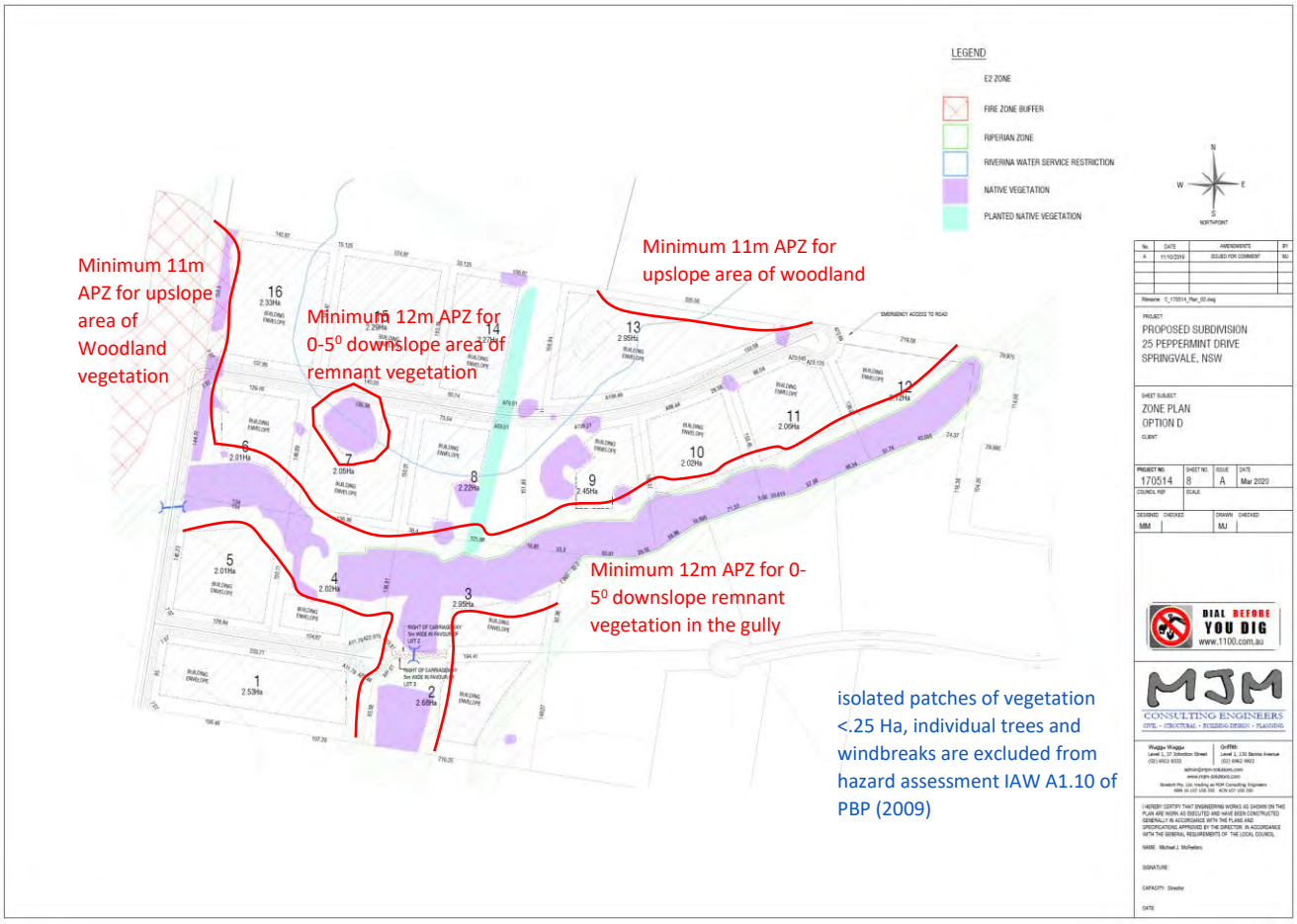

Figure 17: Demonstration of minimum APZ setbacks from hazard vegetation for future construction

Landscaping	
	PERFORMANCE CRITERIA TO BE ACHIEVED:
	Section 5.3.1 of PBP states that the intent of measures may be achieved where: ● Landscaping is designed and managed to minimise flame contact and radiant heat to buildings, and potential for wind driven embers to cause ignitions
	METHOD OF MEETING THE PERFORMANCE CRITERIA:
	Landscaping and fencing are not part of this proposal. It is expected that landscaping works will be undertaken at the time of construction and will be required to be in accordance with section 7.6 of PBP (2019).

The proposal is for rural residential subdivision. Landscaping will be undertaken at the time of construction of any dwelling on each lot.

The existing residential building in the development site was constructed post 2002 and is assumed to comply with bushfire requirements at the time of construction. The building appears to meet the requirements for ember protection, with metal flyscreens and ember screens fitted to all openings that were inspected. No upgrades of the existing structure are required.

Figure 18: The existing residence

5.2 Access Requirements

The intent of measures for Access detailed in PBP (2019) is:

> *"To provide safe operational access to structures and water supply for emergency services while residents are seeking to evacuate from an area"* (NSW Rural Fire Service, 2019)

The purpose of the public road system is to provide firefighters with access to properties, provide a safe retreat for firefighters and firefighting appliances, and provide a clear control line from which to conduct hazard reduction or back burning operations. Roads should provide sufficient width for firefighters to work with equipment around the vehicle without impeding residents that are seeking to evacuate the area.

Access - General	***PERFORMANCE CRITERIA TO BE ACHIEVED:***
	Section Table 5.3b of PBP states that the intent may be achieved where: • Firefighters are provided with safe all-weather access to structures • The capacity of access roads is adequate for firefighting vehicles • There is appropriate access to water supply •
Perimeter Roads	• Access roads are designed to allow safe access and egress for firefighting vehicles while residents are evacuating as well as providing a safe operational environment for emergency service personnel during firefighting and emergency management on the interface
Non-Perimeter roads	• Access roads are designed to allow safe access and egress for firefighting vehicles while residents are evacuating
Property	• Firefighting vehicles can access the dwelling and exit the property safely
	METHOD OF MEETING THE PERFORMANCE CRITERIA:
	Compliance with the acceptable solutions of PBP (2019).

The design of the subdivision is such that a perimeter road is provided on the south and western interface with hazard vegetation. The north and eastern boundary of the development has no interface with the bushfire hazard.

All new roads are to be bitumen sealed 2 way roads, with hydrant provision located in the road verge. on-street parking is not provided.
The dead end roads have a turning circle provided at the end with a turning radius greater than 12m, with an emergency access provided to Currawang Dr where the length of the dead end is extended.

Individual property access is not provided at this time, property access will be provided at DA for construction when the specific location of the building is confirmed.

The following reccomendations are made to ensure compliance with the acceptable solutions of PBP (2019)

1. An access road is to be provided on the western boundary of lot 16. This is intended to complete the perimeter access and provide separation from the hazard vegetation for lot 16. This trail is not required to be sealed, but is to be 2 wheel drive all weather surface, minimum 4m wide with 4 m overhead clearance to any obstruction.
2. Any traffic management devices on the emergency access road are to constructed so they wont prohibit access by emergency vehicles.
3. The capacity of the road surface and bridges/causeways over to be sufficient to carry a fully loaded fire fighting vehicle (up to 23 tonnes). Bridges/causeways are to be signposted to indicate load rating.
4. Individual property access roads will be adressed at DA for construction when the specific location of the building is confirmed.

Figure 19: Access layout of the new subdivision

Figure 20: Location of new access road to be provided in the road easement from Dunns Rd.

Figure 21: Existing sealed access to be retained for emergency access to Currowan Dr

Figure 22: Standard of access provision through adjacent development

5.3 Services – Water, Electricity and Gas

The intent of measures for services detailed in PBP (2019) is:

"To provide adequate services of water for the protection of buildings during and after the passage of a bushfire, and to locate gas and electricity so as not to contribute to the risk of fire to the buildings" (NSW Rural Fire Service, 2019)

An adequate supply of water is essential for firefighting. A reticulated supply is to be provided where possible, and a static water supply to be made available for non-reticulated development

Water Supply	***PERFORMANCE CRITERIA TO BE ACHIEVED:***
	Table 5.3c of PBP states that the intent may be achieved where: ● Adequate water supply is provided for firefighting purposes ● Water supply is located at regular intervals ● Water supply is accessible and reliable for firefighting operations ● Flows and pressures are appropriate ● The integrity of the supply is maintained
	METHOD OF MEETING THE PERFORMANCE CRITERIA:
	Compliance with Acceptable solutions of PBP (2019.

A reticulated water supply is intended to be provided for the development, with street hydrants provided in the road verge similar to the adjacent residential development areas. Water service restrictions may apply to lots 13,14,15 and 16 due to the elevated positions not achieving adequate head pressure from the water supply reservoir.

The following recommendations are made to ensure compliance with the acceptable solutions detailed in table 5.3 of PBP (2017)

1. Street hydrants are to be designed and spaced to comply with the requirements of AS2419.1:2005
2. Reticulated water supply is to use a ring main where perimeter roads are provided.
3. Hydrants are to be located in the road verge, and clearly marked.
4. Where water service restrictions reduce the capacity of the reticulated water supply at lots 7- 9 and 13-16. A 20,000L static water supply may be required for each lot in accordance with table 5.3d of PBP (2019). This may be provided at time of construction when the specific location of the building and capacity of services is confirmed.

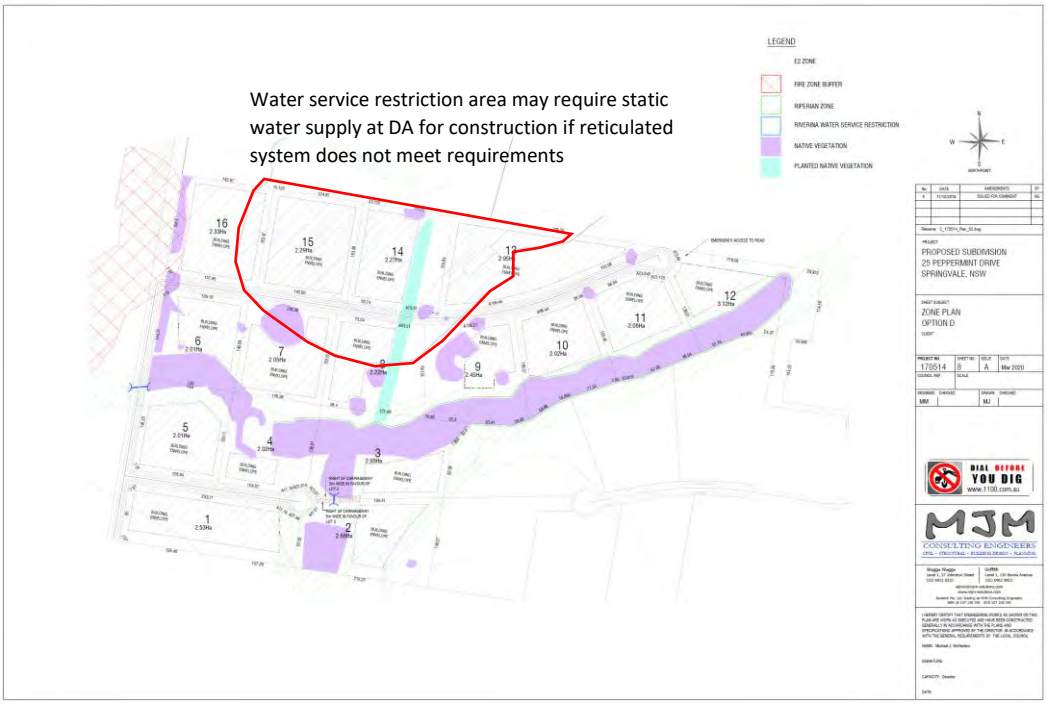

Figure 23: Water service restriction area affecting lots 7-9 and 13 -16

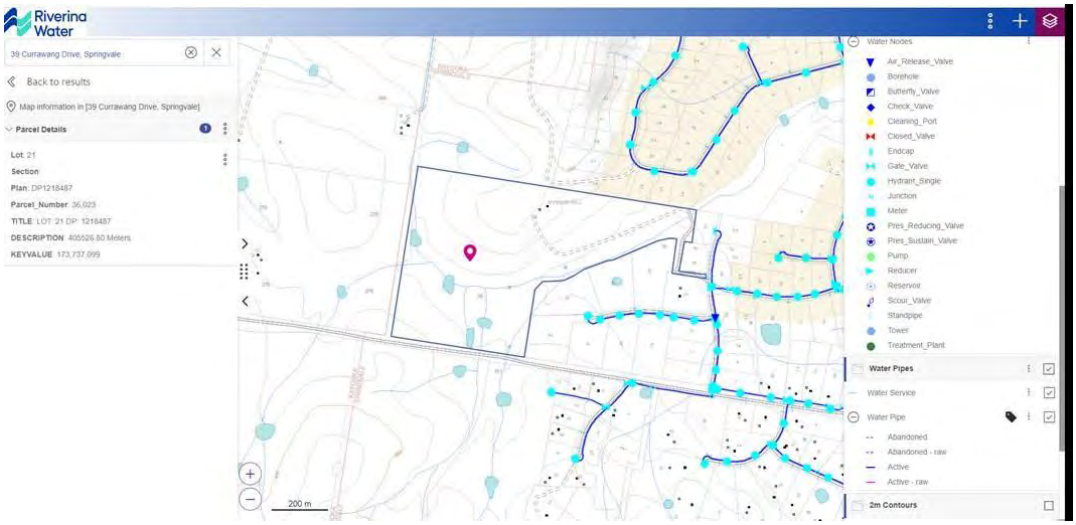

Figure 24: Hydrant provision in surrounding development

Figure 25: Example of marking of feed hydrant located in the verge of adjacent development

Electricity Supply	PERFORMANCE CRITERIA TO BE ACHIEVED:
	Table 5.3c of PBP states that the intent may be achieved where: ● Location of electricity services limits the possibility of ignition of the surrounding bushland or the fabric of buildings
	METHOD OF MEETING THE PERFORMANCE CRITERIA:
	Compliance with the acceptable solutions of PBP (2019)

All new power transmission lines are intended to be underground.

Gas Supply	PERFORMANCE CRITERIA TO BE ACHIEVED:
	Section 5.3.3 of PBP states that the intent may be achieved where: ● Location and design of gas services will not lead to ignition of surrounding bushland or the fabric of buildings.
	METHOD OF MEETING THE PERFORMANCE CRITERIA:
	Compliance with the acceptable solutions of PBP (2019)

There is no reticulated gas supply in the area. If a bottled gas supply is installed it will be adressed at the time of future construction.

6. Conclusion

The proposal is initially seeking to rezone the property from RU1 Primary Production to R5 Large Lot Residential with a minimum lot size of 2Ha. Should the planning proposal be successful, then a DA for subdivision of the property consistent with the development plan provided would be prepared and lodged with Council.

The bushfire hazard consists of Woodland, Grassland and Remnant vegetation within the subdivision. The lots are all greater than 2Ha with large building envelopes that are more than capable of providing an APZ that exceeds the requirements of table A1.12.3 of PBP (2019) within each lot. Detail of each APZ will be confirmed at DA for construction when the specific building footprint is known.
Access is provided with two-way bitumen sealed roads, with emergency access provided for the extended dead end.
Assessment finds that the proposal can comply with the requirements of Planning for Bushfire Protection (2019) through the use of the acceptable solutions with the following recommendations:

7. Recommendations.

The following recommendations are made to ensure the development complies with the acceptable solutions of NSW Planning for Bushfire Protection (2019)

With Regard to Access:

The following reccomendations are made to ensure compliance with the acceptable solutions of PBP (2019)

1. An access road is to be provided through the road easement on the western boundary of lot 16. This is intended to complete the perimeter access and provide separation from the hazard vegetation for lot 16. This trail is not required to be sealed, but is to be 2 wheel drive all weather surface, minimum 4m wide with 4 m overhead clearance to any obstruction.
2. Any traffic management devices on the emergency access road are to constructed so they wont prohibit access by emergency vehicles.
3. The capacity of the road surface and bridges/causeways over to be sufficient to carry a fully loaded fire fighting vehicle (up to 23 tonnes). Bridges/causeways are to be signposted to indicate load rating.
4. Individual property access roads will be adressed at DA for construction when the specific location of the building is confirmed.

With Regards to Water Supply:

The following recommendations are made to ensure compliance with the acceptable solutions detailed in table 5.3 of PBP (2017)

1. Street hydrants are to be designed and spaced to comply with the requirements of AS2419.1:2005
2. Reticulated water supply is to use a ring main where perimeter roads are provided.
3. Hydrants are to be located in the road verge, and clearly marked.
4. Where water service restrictions reduce the capacity of the reticulated water supply at lots 7- 9 and 13-16. A 20,000L static water supply may be required for each lot in accordance with table 5.3d of PBP (2019). This may be provided at time of construction when the specific location of the building and capacity of services is confirmed

Assessment of alternative concept plans

The following is an assessment of alternate layouts that have been developed for consideration. The access arrangement and block boundaries vary, but the hazard assessment and APZ calculations for the required setbacks from vegetation does not. Each lot remains capable of providing an individual APZ for construction.

1. Layout E

Layout E is a variation to the access arrangement where a single public access road is provided through the development from Dunns Rd. Emergency access is provided from the extended dead end back to Currawang Dr. There is no perimeter road provided in this layout.

Layout E concept plan

Overlay of option E

Layout E Planning for Bushfire (2019) compliance summary

	Performance Criteria	*Compliance*	*Comment*
Asset Protection Zones	• Potential building footprints must not be exposed to radiant heat levels exceeding 29kw/m^2 on each proposed lot • APZs are managed and maintained to prevent the spread of fire towards the building. • APZ is provided in perpetuity. • APZ maintenance is practical, soil stability is not compromised and the potential for crown fires is minimised.	Meets acceptable solutions	All lots are >2Ha. There is sufficient space within each lot to provide an APZ that exceeds the requirements of A1.12.3 of PBP (2019) for future construction. There are no steep slopes or riparian zones located within the APZ's.
Landscaping	• Landscaping is designed and managed to minimise flame contact and radiant heat to buildings and the potential for wind driven embers to cause ignitions.	Meets acceptable solutions	Landscaping detail will be addressed at DA for construction of buildings.
Access – General Requirements	• Firefighters are provided with safe all-weather access to structures • The capacity of access roads is adequate for firefighting vehicles • There is appropriate access to water supply • Parking does not obstruct the minimum paved road width	Meets acceptable solutions	The public road is a 2-way bitumen sealed road through grassland. Bridges or causeways are to have a minimum 23 tonne load rating signposted. Reticulated feed hydrants are to be provided in the road verge and there is no on street parking provision.
Access – Perimeter roads	• Access roads are designed to allow safe egress for firefighting vehicles while residents are evacuating as well as providing a safe operational environment for emergency service personnel during firefighting and emergency management on the interface	N/A	There is no perimeter road proposed in this layout.

Access – Non Perimeter roads	• The width and design of fire trails enable safe and ready access for firefighting vehicles • Fire trails are trafficable under all weather conditions. Where fire trails join a public road, access shall be controlled to prevent use by non-authorized persons. • Fire trails are designed to prevent weed infestation, soil erosion	Meets acceptable solutions	The public road is a 2 way bitumen sealed road. A turning circle of >12m is provided at the dead end, with an emergency access is provided to Currawang Drive for emergency vehicles. Traffic management devices on the emergency access road are to be constructed so they won't prohibit access by emergency vehicles. No fire trails are involved in this proposal.
Property Access	• Firefighting vehicles can access the dwelling and exit the property safely	Meets acceptable solutions	Property access will be addressed at DA for construction when the position of the building is confirmed.
Water Supplies	• Adequate water supply is provided for firefighting purposes • Water supply is located at regular intervals • Water supply is accessible and reliable for firefighting operations • Flows and pressures are appropriate • The integrity of the supply is maintained	Meets acceptable solutions	Reticulated supply feed hydrants are to be provided at spacing, pressure and flow to comply with AS2419.1:2005. Where Riverina water restrictions apply and the reticulated system is not capable of meeting the pressure/flow requirements, a 20,000L static water supply is to be provided in line with the requirements of PBP (2019) at construction of any residential building.
Electricity services	• Location of electricity services limits the possibility of ignition of the surrounding bushland or the fabric of buildings	Meets acceptable solutions	All electrical transmission lines are to be underground where possible.
Gas Services	• Location and design of gas services will not lead to ignition of surrounding bushland or the fabric of buildings	Meets acceptable solutions	No reticulated gas supply is involved in this proposal. Bottled gas supply will be addressed at DA for construction if required.

2. Layout F

Layout F is a variation where the public access road is provided as an extension of Pimlea Place. This layout involves an extended dead end road, with emergency access is provided to Dunns Rd and Currawang Drive.

layout F Concept plan

Overlay of option F

Layout F Planning for Bushfire Protection (2019) Compliance Summary

	Performance Criteria	*Compliance*	*Comment*
Asset Protection Zones	• Potential building footprints must not be exposed to radiant heat levels exceeding 29kw/m^2 on each proposed lot • APZs are managed and maintained to prevent the spread of fire towards the building. • APZ is provided in perpetuity. • APZ maintenance is practical, soil stability is not compromised and the potential for crown fires is minimised.	Meets acceptable solutions	All lots are >2Ha. There is sufficient space within each lot to provide an APZ that exceeds the requirements of A1.12.3 of PBP (2019) for future construction. There are no steep slopes or riparian zones located within the APZ's.
Landscaping	• Landscaping is designed and managed to minimise flame contact and radiant heat to buildings and the potential for wind driven embers to cause ignitions.	Meets acceptable solutions	Landscaping detail will be addressed at DA for construction of buildings.
Access – General Requirements	• Firefighters are provided with safe all-weather access to structures • The capacity of access roads is adequate for firefighting vehicles • There is appropriate access to water supply • Parking does not obstruct the minimum paved road width	Meets acceptable solutions	The public road is a 2-way bitumen sealed road through grassland. Bridges or causeways are to have a minimum 23 tonne load rating signposted. Reticulated feed hydrants are to be provided in the road verge and there is no on street parking provision.
Access – Perimeter roads	• Access roads are designed to allow safe egress for firefighting vehicles while residents are evacuating as well as providing a safe operational environment for emergency service personnel during firefighting and emergency management on the interface	N/A	There is no perimeter road proposed in this layout.

Access – Non-Perimeter roads	• The width and design of fire trails enable safe and ready access for firefighting vehicles • Fire trails are trafficable under all weather conditions. Where fire trails join a public road, access shall be controlled to prevent use by non-authorized persons. • Fire trails are designed to prevent weed infestation, soil erosion	Meets acceptable solutions	The public road is a 2 way bitumen sealed road. A turning circle of >12m is provided at the dead end, with an emergency access is provided to Dunns Rd and Currawang Drive for emergency vehicles. Traffic management devices on the emergency access road are to be constructed so they won't prohibit access by emergency vehicles. No fire trails are involved in this proposal.
Property Access	• Firefighting vehicles can access the dwelling and exit the property safely	Meets acceptable solutions	Property access will be addressed at DA for construction when the position of the building is confirmed.
Water Supplies	• Adequate water supply is provided for firefighting purposes • Water supply is located at regular intervals • Water supply is accessible and reliable for firefighting operations • Flows and pressures are appropriate • The integrity of the supply is maintained	Meets acceptable solutions	Reticulated supply feed hydrants are to be provided at spacing, pressure and flow to comply with AS2419.1:2005. Where Riverina water restrictions apply and the reticulated system is not capable of meeting the pressure/flow requirements, a 20,000L static water supply is to be provided in line with the requirements of PBP (2019) at construction of any residential building.
Electricity services	• Location of electricity services limits the possibility of ignition of the surrounding bushland or the fabric of buildings	Meets acceptable solutions	All electrical transmission lines are to be underground where possible.
Gas Services	• Location and design of gas services will not lead to ignition of surrounding bushland or the fabric of buildings	Meets acceptable solutions	No reticulated gas supply is involved in this proposal. Bottled gas supply will be addressed at DA for construction if required.

3. Layout G

Layout G retains the perimeter road up the western interface to providing separation from the woodland vegetation and good access for firefighting. The length of the lower dead end is reduced to ~213m and lots 2 and 3 have a shared access arrangement of around 100m to the BE. Emergency access to Currawang Dr remains for the extended dead end.

Layout G Concept Plan

Overlay of Option G

Layout G: Planning for Bushfire Protection (2019) Compliance Summary

	Performance Criteria	*Compliance*	*Comment*
Asset Protection Zones	• Potential building footprints must not be exposed to radiant heat levels exceeding 29kw/m^2 on each proposed lot • APZs are managed and maintained to prevent the spread of fire towards the building. • APZ is provided in perpetuity. • APZ maintenance is practical, soil stability is not compromised and the potential for crown fires is minimised.	Meets acceptable solutions	All lots are >2Ha. There is sufficient space within each lot to provide an APZ that exceeds the requirements of A1.12.3 of PBP (2019) for future construction. There are no steep slopes or riparian zones located within the APZ's.
Landscaping	• Landscaping is designed and managed to minimise flame contact and radiant heat to buildings and the potential for wind driven embers to cause ignitions.	Meets acceptable solutions	Landscaping detail will be addressed at DA for construction of buildings.
Access – General Requirements	• Firefighters are provided with safe all-weather access to structures • The capacity of access roads is adequate for firefighting vehicles • There is appropriate access to water supply • Parking does not obstruct the minimum paved road width	Meets acceptable solutions	The public roads are 2-way bitumen sealed roads through grassland. Bridges or causeways are to have a minimum 23 tonne load rating signposted. Reticulated feed hydrants are to be provided in the road verge and there is no on street parking provision.
Access – Perimeter roads	• Access roads are designed to allow safe egress for firefighting vehicles while residents are evacuating as well as providing a safe operational environment for emergency service personnel during firefighting and emergency management on the interface	Meets acceptable solutions	The layout provided a perimeter road up the western interface. It is recommended to extend an emergency access provision along the road easement on the west of lot 16 to improve firefighting access to the interface.

Access – Non Perimeter roads	• The width and design of fire trails enable safe and ready access for firefighting vehicles • Fire trails are trafficable under all weather conditions. Where fire trails join a public road, access shall be controlled to prevent use by non-authorized persons. • Fire trails are designed to prevent weed infestation, soil erosion	Meets acceptable solutions	The public roads are 2 way bitumen sealed roads. A turning circle of >12m is provided at the dead ends, with an emergency access is provided from the extended dead end to Currawang Drive. Traffic management devices on the emergency access road are to be constructed so they won't prohibit access by emergency vehicles. No fire trails are involved in this proposal.
Property Access	• Firefighting vehicles can access the dwelling and exit the property safely	Meets acceptable solutions	Property access will be addressed at DA for construction when the position of the building is confirmed.
Water Supplies	• Adequate water supply is provided for firefighting purposes • Water supply is located at regular intervals • Water supply is accessible and reliable for firefighting operations • Flows and pressures are appropriate • The integrity of the supply is maintained	Meets acceptable solutions	Reticulated supply feed hydrants are to be provided at spacing, pressure and flow to comply with AS2419.1:2005. Where Riverina water restrictions apply and the reticulated system is not capable of meeting the pressure/flow requirements, a 20,000L static water supply is to be provided in line with the requirements of PBP (2019) at construction of any residential building.
Electricity services	• Location of electricity services limits the possibility of ignition of the surrounding bushland or the fabric of buildings	Meets acceptable solutions	All electrical transmission lines are to be underground where possible.
Gas Services	• Location and design of gas services will not lead to ignition of surrounding bushland or the fabric of buildings	Meets acceptable solutions	No reticulated gas supply is involved in this proposal. Bottled gas supply will be addressed at DA for construction if required.

References

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No.	DATE	AMENDMENTS	BY
A	01/07/2020	ISSUED FOR COMMENT	MJ

Filename: C_170514_Plan_02.dwg

PROJECT

PROPOSED SUBDIVISION
25 PEPPERMINT DRIVE
SPRINGVALE, NSW

SHEET SUBJECT

LAYOUT PLAN
OPTION E

CLIENT

PROJECT NO.	SHEET NO.	ISSUE	DATE
170514	13	E	Jul 2020
COUNCIL REF.	SCALE		
DESIGNED CHECKED		DRAWN CHECKED	
MM		MJ	

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Bowtort Pty. Ltd. trading as MJM Consulting Engineers
ABN 16 107 158 350 ACN 107 158 350

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NAME: Michael J. McFeeters

SIGNATURE:

CAPACITY: Director

DATE:

No.	DATE	AMENDMENTS	BY
A	01/07/2020	ISSUED FOR COMMENT	MJ

Filename: C_170514_Plan_02.dwg

PROJECT

PROPOSED SUBDIVISION
25 PEPPERMINT DRIVE
SPRINGVALE, NSW

SHEET SUBJECT

LAYOUT PLAN
OPTION F

CLIENT

PROJECT NO.	SHEET NO.	ISSUE	DATE
170514	14	A	Jul 2020
COUNCIL REF.	SCALE		

DESIGNED	CHECKED	DRAWN	CHECKED
MM		MJ	

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NAME: Michael J. McFeeters

SIGNATURE:

CAPACITY: Director

DATE:

No.	DATE	AMENDMENTS	BY
A	01/07/2020	ISSUED FOR COMMENT	MJ

Filename: C_170514_Plan_02.dwg

PROJECT

PROPOSED SUBDIVISION
25 PEPPERMINT DRIVE
SPRINGVALE, NSW

SHEET SUBJECT

LAYOUT PLAN
OPTION G

CLIENT

PROJECT NO.	SHEET NO.	ISSUE	DATE
170514	15	A	Jul 2020
COUNCIL REF.	SCALE		
DESIGNED CHECKED		DRAWN CHECKED	
MM		MJ	

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NAME: Michael J. McFeeters

SIGNATURE:

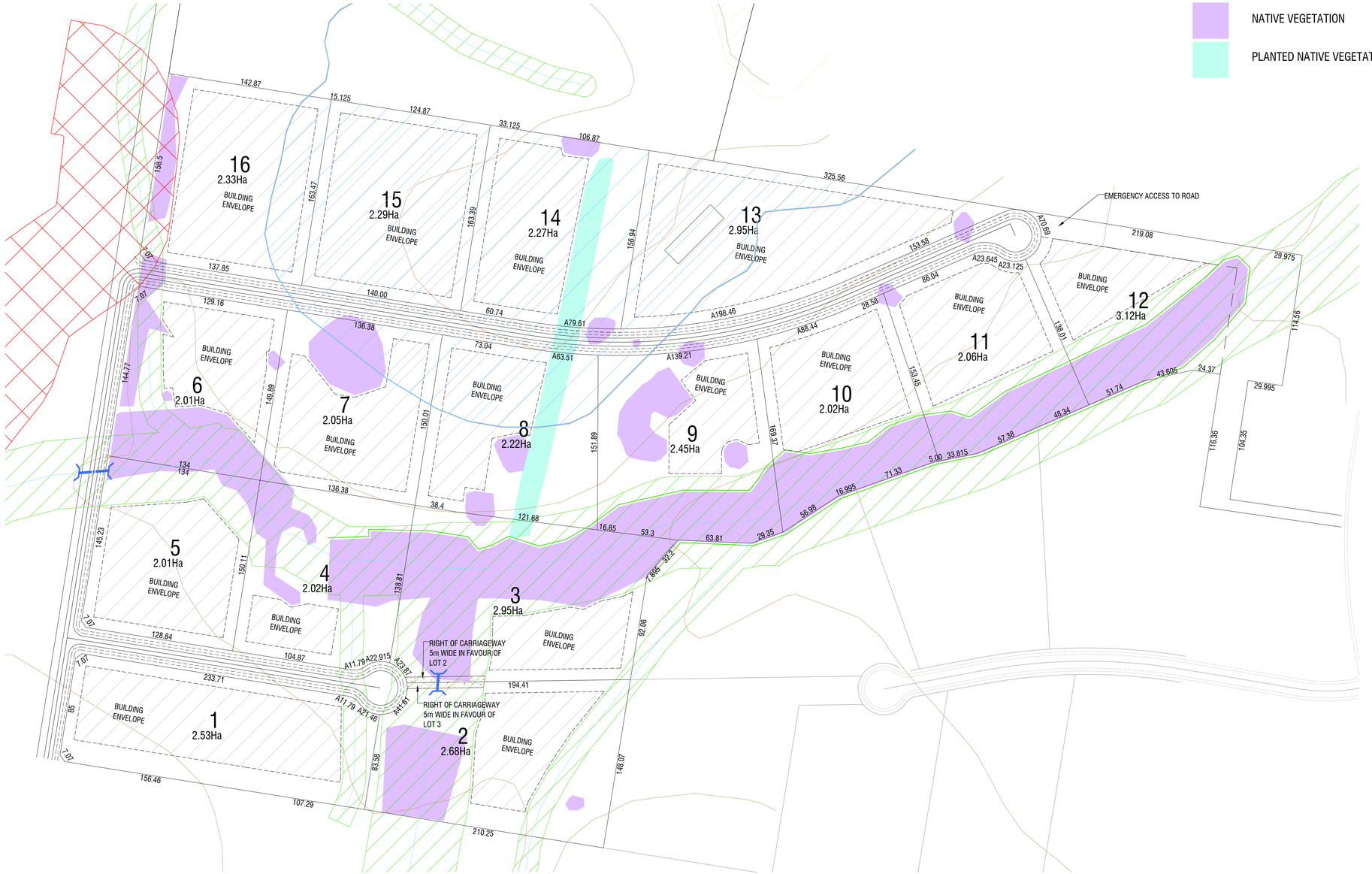
CAPACITY: Director

DATE:

LEGEND

- E2 ZONE
- FIRE ZONE BUFFER
- RIPERIAN ZONE
- RIVERINA WATER SERVICE RESTRICTION
- NATIVE VEGETATION
- PLANTED NATIVE VEGETATION

N
W E
S
NORTHPOINT



No.	DATE	AMENDMENTS	BY
A	11/10/2019	ISSUED FOR COMMENT	MJ

Filename: C_170514_Plan_02.dwg

PROJECT

PROPOSED SUBDIVISION
25 PEPPERMINT DRIVE
SPRINGVALE, NSW

SHEET SUBJECT

ZONE PLAN
OPTION D

CLIENT

PROJECT NO.	SHEET NO.	ISSUE	DATE
170514	8	A	Mar 2020
COUNCIL REF.	SCALE		
DESIGNED CHECKED		DRAWN CHECKED	
MM		MJ	

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NAME: Michael J. McFeeters

SIGNATURE:

CAPACITY: Director

DATE:

RP-6 REZONE PART LOT 1 DP 1013392 FROM RU1 PRIMARY PRODUCTION TO R5 LARGE LOT RESIDENTIAL AND REZONE PART LOT 2 DP 1065108 FROM R5 LARGE LOT RESIDENTIAL TO RU1 PRIMARY PRODUCTION - DUNN'S ROAD SPRINGVALE

Author: **Golden, Crystal**
Director: **Crakanthorp, Andrew**

Recommendation

That Council forward the planning proposal for the change of zones and minimum lot sizes over the subject land to the Department of Planning and Infrastructure under Section 56(1) of the Environmental Planning and Assessment Act, requesting that the Minister issue a "gateway determination" that will allow the planning proposal to proceed.

Report

Background

The purpose of this report and attached Planning Proposal is to facilitate the proposed subdivision of part Lot 1 DP 1013392 and part Lot 2 DP 1065108 in proximity to Dunn's Road, Springvale.

In May 2011 the owner of Lot 1 DP 1013392 and Lot 2 DP 1065108 approached Council regarding their proposed Dunn's Road subdivision. The proposed subdivision would have required direct access to Dunn's Road and the costs associated with upgrading the road to service the subdivision was not commercially viable. It was proposed that a land zoning swap between RU1 Primary Production and R5 Large Lot Residential and vice-versa with an associated change in the minimum lot size would assist to facilitate the proposed subdivision, minimise traffic implications and also minimise associated costs by removing the need for access to Dunn's Road.

The current R5 Large Lot Residential in that area has a Minimum Lot Size of 8 hectares. This will not allow the proposed subdivision's configuration to proceed. Therefore the proposal is to change the Minimum Lot Size from 8 hectares to 2 hectares for the proposed subdivision.

Discussions with NSW Office of Environment and Heritage identified the need for a seven part test in accordance with the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* and the *NSW Threatened Species Conservation Act 1995* as part of the subdivision fell outside of the Biodiversity Certification area. This seven part test is attached to this report.

Should this report receive the endorsement of Council, a win/win outcome will be realised. The planning proposal has the support of the applicant.

Planning Proposal

The purpose of this Planning Proposal is to rezone part Lot 1 DP 1013392 from RU1 Primary Production to R5 Large Lot Residential and rezone part Lot 2 DP 1065108 from R5 Large Lot Residential to RU1 Primary Production with associated minimum lot size changes. The current R5 minimum lot size of 8 hectares will not allow the proposed configuration of lots to proceed. Therefore the proposal will seek a change in the minimum lot size from 8 hectares to 2 hectares for the proposed subdivision.

This Planning Proposal will require changes to both Land Zoning and Minimum Lot Size maps.

Next Steps

Following endorsement by Council, the Planning Proposal will be forwarded to the Department of Planning and Infrastructure seeking a Gateway determination to proceed with the amendment. The Gateway decision will set out requirements for any additional investigations, consultations and the timing of any required changes to the WWLEP 2010.

Budget

N/A

Policy

Wagga Wagga Local Environmental Plan 2010.

Impact on Public Utilities

N/A

Link to Strategic Plan

6. A sustainable environment

6.4 Develop sustainable built and natural environments for current and future generations through effective land-use management and planning

QBL Analysis

	Positive	**Negative**
Social	The proposed rezoning will provide the community with more zoned land for rural purposes. While providing an appropriate transitional zone between rural residential and rural land and minimising any future land use conflicts in the locality.	N/A
Environmental	The proposed RU1 land will protect the localities biodiversity values.	N/A
Economic	The subdivision will reduce the potential adverse impacts and infrastructure costs on Dunns Road.	N/A
Governance	N/A	N/A

Risk Management Issues for Council

No specific issues identified.

Internal / External Consultation

Stakeholder consultation is intended to be undertaken for a minimum period of 28 days after receipt of the gateway determination.

Attachments

1. Planning Proposal - Dunns Road Rezoning.
2. Planning Proposal - Section 117 directions.
3. Attachment A - Figure 1.3 E_rezoning Plan.
4. Attachment B - Site ID Map - Dunns Road Minimum Lot Size.
5. Attachment C - Dunns Road Rezoning: Ecological Assessment March 2012 - (Provided under separate cover).
6. Site ID Map - Dunns Road Proposed Land Zoning .

PLANNING PROPOSAL

Rezone part of Lot 1 DP 1013392 from RU1 Primary Production to R5 Large Lot Residential and rezone part of Lot 2 DP 1065108 from R5 Large Lot Residential to RU1 Primary Production

PART 1 – OBJECTIVES OR INTENDED OUTCOMES

Item 1: To rezone part of 7159 Holbrook Road, Springvale (Lot 1 DP 1013392) from RU1 Primary Production to R5 Large Lot Residential.

Item 2: To rezone part of Dunn's Road, Springvale (Lot 2 DP 1065108) from R5 Large Lot Residential to RU1 Primary Production. This zone change will require a change in the Minimum Lot Size map to comply with the surrounding RU1 Primary Production zone. This area will be changed from an 8 hectare MLS to a 200 hectare MLS.

Item 3: In order for the proposed subdivision to proceed, a change in the minimum lot size is required for the R5 Large Lot Residential land. A change from 8 hectares MLS to 2 hectare MLS is required for the proposed subdivision. A 2 ha MLS is consistent with the surrounding subdivision pattern of the area.

PART 2 – EXPLANATION OF THE PROVISIONS

Item 1: Amend the WWLEP 2010 zoning map as shown in Attachment A. Attachment A shows the adjusted zone boundaries from RU1 Primary Production to R5 Large Lot Residential and vice-versa. The amount of land in Lot 1 DP 1013392 being rezoned from RU1 Primary Production to R5 Large Lot Residential is approximately 78,185 m^2 (7.8185 hectares).

Item 2: Amend the WWLEP 2010 zoning map as shown in Attachment A. Attachment A shows the adjusted zone boundaries from R5 Large Lot Residential to RU1 Primary Production. The amount of land in Lot 2 DP 1065108 being rezoned from R5 Large Lot Residential to RU1 Primary Production is approximately 131,093 m^2 (13.1093 hectares).

Amend the WWLEP 2010 Minimum Lot Size map as shown in Attachment B. Attachment B shows the adjusted Minimum Lot Size from 8 hectares to 200 hectares for the RU1 Primary Production land.

Item 3: Amend the WWLEP 2010 Minimum Lot Size map as shown in Attachment B. Attachment B shows the adjusted Minimum Lot Size for the R5 Large Lot Residential from 8 hectares to 2 hectares. This reduction in the Minimum Lot Size for this R5 zoned land will allow for the subdivision of this land to occur and is consistent with the surrounding subdivision pattern.

PART 3 – JUSTIFICATION

Section A – Need for the planning proposal

1. Is the planning proposal a result of any strategic study or report?

No. The items subject to this Planning Proposal have not been subject to specific strategic studies or reports. However, The NSW Office of Environment and Heritage indicated that because part of the area fell outside of Council's Biodiversity Certification area that the applicant would have to submit a seven part test in accordance with *NSW Threatened Species Conservation Act 1995* and *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* which is attached to this proposal (Attachment C).

The report entitled *Dunns Road Rezoning: Ecological Assessment March 2012* indicates the proposed subdivision could potentially have ecological impacts as a result of this proposal but they are of a minor nature and mitigation measures have been detailed in the report.

2. Is the planning proposal the best means of achieving the objectives or intended outcomes, or is there a better way?

Yes. The current 8 hectare Minimum Lot Size (MLS) for this area will not allow the proposed subdivision to occur. Therefore to allow the proposed development to occur a change from 8 hectare MLS to a 2 hectare MLS is required. However to ensure no further development or rural fragmentation and to prevent any further development west of Dunn's Road part of Lot 2 DP 1065108 is to be rezoned from R5 Large Lot Residential to RU1 Primary Production with the associated change in the Minimum Lot Size to 200 hectares.

3. Is there a net community benefit?

Yes. A change in the R5 Large Lot Residential Minimum Lot Size from 8 hectares to 2 hectares will allow a small amount of rural residential land to be developed whilst minimising the amount of rural land fragmentation in the surrounding area. This also increases the amount of residual rural land and protecting biodiversity. In addition to reducing potential adverse impacts and therefore infrastructure costs on Dunn's Road.

Section B – Relationship to strategic planning framework.

4. Is the planning proposal consistent with the objectives and actions contained within the applicable regional or sub-regional strategy?

There are no applicable regional or sub-regional strategies applying to the Wagga Wagga LGA.

5. Is the planning proposal consistent with the local council's Community Strategic Plan, or other local strategic plan?

All elements of the Planning Proposal are consistent with the Wagga Wagga Community Strategic Plan 2011-2021.

All elements of the Planning Proposal are consistent with the Wagga Wagga Spatial Plan 2008.

6. Is the planning proposal consistent with applicable state environmental planning policies?

The proposal is consistent with relevant State Environmental Planning Policies.

7. Is the planning proposal consistent with applicable Ministerial Directions (s. 117 directions)?

The Planning Proposal is consistent with Section 117 Directions. Details of applicable Directions are appended. The following Ministerial Directions are of particular relevance:

Direction 1.2 – Rural Zones

The Planning Proposal is inconsistent with this direction as it seeks to rezone RU1 Primary Production land to R5 Large Lot Residential. However this is of minor significance as the proposal seeks to rezone R5 Large Lot Residential to RU1 Primary Production to protect biodiversity certified land. The result of the proposal will be an increase in the area of residual RU1 land. Therefore the proposal is consistent with this direction.

Direction 1.5 – Rural Lands

Item 1 of the Planning Proposal is inconsistent with this direction as it seeks to rezone RU1 Primary Production land to R5 Large Lot Residential and in addition, to change the minimum lot size for rural land as well. However it is of minor significance as Item 2 will return more RU1 Primary Production land. In turn, Item 2 consistency ameliorates any impacts that may have resulted from Item 1 inconsistency which is consistent with the Rural Planning Principles contained in the *State Environmental Planning Policy (Rural Lands) 2008* as follows:

> *(a) the promotion and protection of opportunities for current and potential productive and sustainable economic activities in rural areas,*
> *(b) recognition of the importance of rural lands and agriculture and the changing nature of agriculture and of trends, demands and issues in agriculture in the area, region or State,*
> *(c) recognition of the significance of rural land uses to the State and rural communities, including the social and economic benefits of rural land use and development,*
> *(d) in planning for rural lands, to balance the social, economic and environmental interests of the community,*
> *(e) the identification and protection of natural resources, having regard to maintaining biodiversity, the protection of native vegetation, the importance of water resources and avoiding constrained land,*
> *(f) the provision of opportunities for rural lifestyle, settlement and housing that contribute to the social and economic welfare of rural communities,*
> *(g) the consideration of impacts on services and infrastructure and appropriate location when providing for rural housing,*
> *(h) ensuring consistency with any applicable regional strategy of the Department of Planning or any applicable local strategy endorsed by the Director-General.*

Item 2 consistency ameliorates any impacts that may have resulted from Item 1 inconsistency this is also consistent with the Rural Subdivision Principles contained in the *State Environmental Planning Policy (Rural Lands) 2008* as follows:

> *(a) the minimisation of rural land fragmentation,*

(b) the minimisation of rural land use conflicts, particularly between residential land uses and other rural land uses,
(c) the consideration of the nature of existing agricultural holdings and the existing and planned future supply of rural residential land when considering lot sizes for rural lands,
(d) the consideration of the natural and physical constraints and opportunities of land,
(e) ensuring that planning for dwelling opportunities takes account of those constraints.

Due to the size of this land they will be unable to subdivide any further rural land thereby complying with the Rural Planning Principles in *SEPP (Rural Lands) 2008*. Furthermore there will be no rural land use conflicts as the existing R5 Large Lot Residential land is considered to be rural residential land which provides an appropriate transition from residential land to rural land thereby complying with the Rural Subdivision Principles listed in the *SEPP (Rural Lands) 2008*. Item 2 consistency ameliorates any impacts that may have resulted from Item 1 inconsistency. This Planning Proposal is consistent with this direction.

Direction 2.1 – Environment Protection Zones

The Planning Proposal is consistent with this direction. See Attachment C for further details.

Direction 2.3 – Heritage Conservation

The Planning Proposal is consistent with this direction.

Direction 3.1 – Residential Zones

The Planning Proposal is consistent with this direction.

Direction 4.3 – Flood Prone Land

The Planning Proposal is consistent with this direction.

Direction 4.4 – Planning for Bushfire Protection

The Planning Proposal is consistent with this direction.

Direction 6.1 – Approval and Referral Requirements

The Planning Proposal is consistent with this direction.

Direction 6.3 – Site Specific Provisions

The Planning Proposal is consistent with this direction.

Section C – Environmental, social and economic impact.

8. Is there any likelihood that critical habitat or threatened species, populations or ecological communities, or their habitats, will be adversely affected as a result of the proposal?

No. Even though part of the land being rezoning falls outside of the Biodiversity Certification area the impacts of the development are assessed in Attachment C. However, the changes (within the Biodiversity Certification area) will not affect any critical habitat or threatened

species, populations or ecological communities, or their habitats. The other items do not affect any critical habitat or threatened species, populations or ecological communities, or their habitats.

9. Are there any other likely environmental effects as a result of the planning proposal and how are they proposed to be managed?

There are no other known environmental effects that could arise from the Planning Proposal.

10. How has the planning proposal adequately addressed any social and economic effects?

The rezoning of part of Lot 1 DP 1013392 will provide the community with more zoned land for rural residential purposes. While the rezoning of part of Lot 2 DP 1065108 will provide an appropriate transitional zone between rural residential and rural land. Thereby minimising any future land use conflicts in the locality. It is expected that there will be no negative economic effects as a result of this proposal.

Section D – State and Commonwealth interests.

11. Is there adequate public infrastructure for the planning proposal?

Yes. The Planning Proposal does not alter the public infrastructure requirements for the Springvale local area or its surrounds. There are no significant public infrastructure costs associated with the Planning Proposal.

12. What are the views of State and Commonwealth public authorities consulted in accordance with the gateway determination?

No State or Commonwealth public authorities have been consulted in the process of preparing this Planning Proposal.

PART 4 – COMMUNITY CONSULTATION

Any further requirements for community consultation will remain at the discretion of the Department of Planning and Infrastructure as allowed for at the time of gateway determination.

Jenna Amos

From: Aran Beckett <abeckett@rwcc.nsw.gov.au>
Sent: Thursday, 16 April 2020 2:29 PM
To: 'Jenna Amos'
Subject: RE: Request for RWCC formal comments - Proposed rezoning and subdivision 39 Currawang Drive

Hi Jenna,

Thanks for the information you sent through regarding the potential rezoning proposal for 39 Currawang Dr, Springvale.

I have gone back over the preliminary information we have previously discussed, as well as done further detailed investigations into the water supply in the vicinity of this development.

Based on the existing infrastructure in the area, supply to part of the land would be possible from the cul-de-sac end of Pimelea Pl. The existing water main has the potential capacity to be extended to serve part of the land.

Supply from Dunns Rd would not be possible, as existing infrastructure in Dunns Rd would not be sufficient to supply the additional demand without negatively affecting existing connections, as well as the elevation being too high along sections of Dunns Rd.

Based on the existing water supply network in the area, and taking the proposed additional demand into account (16 new connections), for the proposed subdivision of 39 Currawang Dr we would need to limit development to no higher than the 270m AHD elevation. This would mean that any land above the 270m contour could not be supplied from Riverina Waters network in this location. This is necessary to ensure a satisfactory level of service can be provided to the new lots, as well as ensuring a satisfactory level of service is maintained for existing customers/connections.

Please let me know if there's any issues regarding this, or if any further information is required at this stage.

Kind Regards

Aran Beckett
Asset Officer

Riverina Water

91 Hammond Ave (PO Box 456)
Wagga Wagga NSW 2650

Direct: 02 6922 0628

rwcc.nsw.gov.au

From: Jenna Amos [mailto:jenna.amos@mjm-solutions.com]
Sent: Friday, 6 March 2020 2:18 PM
To: Aran Beckett <abeckett@rwcc.nsw.gov.au>
Cc: sortingout@mjm-solutions.com
Subject: Request for RWCC formal comments - Proposed rezoning and subdivision 39 Currawang Drive

Good afternoon Aran,

MJM is acting on behalf of the owner of 39 Currawang Drive, Springvale, in relation to a rezoning of the property for potential future subdivision. It is proposed to rezone the land (currently RU1 Primary Production) to R5 Large Lot Residential with a minimum lot size of 2Ha. Please find attached a potential concept plan. As part of the planning proposal we would like to include comments from RWCC in relation to the serviceability of the lots, should the planning proposal and subsequent DA for subdivision be successful. Any information you are able to provide would be much appreciated. It would be great if we were able to get something back by the end of the month.

If you have any questions or would like to discuss further please do not hesitate to contact our office on 6921 8333.

Kind regards,
[170514]

Jenna Amos
Planning Manager

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